ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change **50.59 Log No.____ or 72.48 Log No.** 94-0-101-001

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

___YES _X_ NO Involve an Unreviewed Safety Question (USQ)?
___YES _X_ NO Involve a change to the Technical Specifications/License Conditions or Bases?
_X_YES ___ NO Require a change or addition to the UFSAR or USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

___YES _X_ NO Involve a Significant Increase in Occupational Dose?
___YES _X_ NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: Sam Shakir SAM SHAKIR Department: CCSO Date: 8/31/94
PRINTED NAME AND SIGNATURE (VECTRA)

_X_YES ___ NO Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: Robert H. Ball (PRINTED NAME)	Resp. Ind.: JOHN B. MAKAR (PRINTED NAME)	Resp. Ind.: Patricia A. Jones (PRINTED NAME)
[signature] (SIGNATURE)	Oss for J.B. MAKAR Per Telecon. (SIGNATURE)	[signature] (SIGNATURE)
Work Group: Fuel Management	Work Group: System Engineer	Work Group: Radiation Safety
Date: 8/31/94	Date: 8/31/94	Date: 8/31/94

Approved ✓ Disapproved ___	Approved ✓ Disapproved ___
Signature Oss for M-TAYLOR Per Telecon (INDEPENDENT REVIEWER (VECTRA))	Signature Michael J. Gahan 9.8.94 (GS-DES, GS-TSED, or PE-PDSU) Oss for J.H. RILEY, CCSO, 8/31/94 Per Telecon.
Date 8/31/94	Date

The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 94-139 Date: 9-12-94

Recommend Approval ✓ Recommend Disapproval____ Signature [signature] (POSRC CHAIRMAN) Date: 9-12-94

Approved ✓ Disapproved____ Signature [signature] (PLANT GENERAL MANAGER) Date: 9/12/94

The OSSRC has reviewed this evaluation according to NS-2-100.
OSSRC Meeting No.: 95-003 Date:__________

Recommend Approval____ Recommend Disapproval____ Signature______________________ (OSSRC CHAIRMAN) Date:__________

WORK GROUP
Licensing Unit
Reviewed By: Getachew Tesfaye
Getachew Tesfaye 8-31-94

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No._____ or 72.48 Log No. 94-0-101-001

Proposed Activity:
To allow closure welds on the DSC shield plug and top cover plate to be made manually in addition to the welding made by the automated welding machine. Manual welding is already allowed for sealing the vent ports on the DSC. That task is listed in Table 7.4-1 of the ISFSI USAR as Seal Weld Penetration Plug. Manual welding for closure welds shall be included within that task. This will result in the following changes to the ISFSI USAR:
1) Change Volume I, Section 1.3.1.8. to read:
"The DSC closure welds on the shield plug and the top cover plate are normally placed by a fully remote, automatic welding system. The system includes modular ... to remove the shield plug and top cover plate closure welds. Manual welding may be used for making closure welds and to substitute for automatic welding when the automatic welding equipment is temporarily unavailable. The allowed duration of manual welding is limited by the ambient dose rate at the location of the welding."
2) Change the description of the seal weld penetration plug task in Table 7.4-1 to read:
"Seal Weld Penetration Plug and Other Manual Welding."
The appropriate ISFSI procedure will be revised to add manual welding in accordance with the ISFSI USAR change.
Reason for Activity:
Manual welding is more efficient than automatic welding in some cases for making closure welds. Manual welding also allows the continuation or completion of welding operations when the automatic welding equipment is temporarily unavailable.

Function (s) of affected SSC:
The only SSC affected by the welding method of the top shield plug and top cover plate to the Dry Shielded Canister (DSC) is the DSC itself. The DSC provides containment and confinement of the spent fuel during storage. The closure welds are part of the containment and confinement boundary.

ISFSI USAR Sections Reviewed:
Vol. I, Section 1.3.1.8, Vol. I, Section 3.3.2.1, Vol. I, Section 5.1.1.3, Vol. I, Section 5.1.1.4, Vol. I, Table 7.4-1, Vol. I, Section 8.2, Vol. I, Section 10.3.2.3, Vol. I, Section 10.3.2.4, Vol. IV, NRC ISFSI SER, Section 2.2.4.4, Vol. V, Technical Specification 3/4.2, Vol. V, Technical Specification Basis 3/4.2.

Complete for 50.59 and 72.48:
1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

____Yes _X_ No — May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

The function of the Dry Shielded Canister as a containment and confinement barrier is not affected by the welding method (manual or automatic) for the closure since the manual welds are made in accordance with the requirements of the Welding Procedure Specification WPS P8-T or P8-T-LH (Manual) and must be nondestructively tested. This procedure is equivalent to WPS P8-T (Machine) used for the automatic machine welding. This procedure and the nondestructive testing will assure the quality and integrity of the welds. Therefore, the probability of a malfunction is not increased by this change.

____Yes _X_ No — May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Any welding placed manually will be made to the same specification and must pass the same testing requirements as that made by the automatic welder. Therefore, this activity does not increase the

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change **50.59 Log No.____ or 72.48 Log No.** 94-0-101-001

consequences of a weld malfunction. The occupational dose consequences for the use of manual welding in place of the automatic remotely operated welder are addressed in the answer to question 3.

___ Yes _X_ No — May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Two accident scenarios, a drop accident and a leakage accident, are addressed in the ISFSI USAR that consider a breach in the containment and confinement boundary formed by the canister closure welds. The probability of these accident is not increased by the proposed change since the integrity and quality of the manual welds will be as good as those made by the automatic welder. The manual welds performed by qualified welders will be placed in accordance with the requirements of WPS P8-T or P8-T-LH (manual), and must pass nondestructive testing. Therefore, the welding method (manual or automatic) is not relevant to the probability of an accident since both welding methods are subject to the same quality and integrity requirements.

___ Yes _X_ No — May the consequences of an accident previously evaluated in the SAR be increased?

The consequences of a drop accident causing failure in the canister closure welds, or the consequences of a DSC leakage accident due to a weld leak are not affected by the welding method.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not increased.

___ Yes _X_ No — May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

No new malfunctions can be caused by the canister closure welding method since the closure welds are done in accordance with all applicable codes, standards and procedures, and must pass the nondestructive testing.

___ Yes _X_ No — May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

No new accidents can be caused by the canister closure welding method since the closure welds are done in accordance with all applicable codes, standards and procedures, and must pass the nondestructive testing .

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any Technical Specification is not reduced.

___ Yes _X_ No — Will the margin of safety as defined in the basis for any Technical Specification be reduced?

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No.____ or 72.48 Log No. 94-0-101-001

Bases	Discussion of why the margin of safety is not reduced
3/4.2	Section 3/4.2 states that the safety analysis of leak tightness of the DSC is based on a weld being leak tight to 10^{-4} atm-cc/s. The proposed change does not change the leak rate criteria. The margin of safety is therefore not reduced.

Complete for 72.48:

___Yes _X_ No Will the proposed activity involve a significant increase in occupational dose?

The estimated personnel dose for all manual welding including the seal weld penetration plug task will remain unchanged at 65.3 mrem, as shown in Table 7.4-1 of the ISFSI USAR. The number of people does not have to be increased to prevent an individual from exceeding any limit of 10 CFR 20. Difficult weld geometry's are encountered when making closure welds, particularly in the keyway area and in weld repairs, requiring multiple setups of the automatic welding machine. Manual welding could replace some of the time needed to manually reset the automatic welder on top of the DSC. The field could then use that time to complete the weld manually instead of resetting the automatic welder several times to do that task. This results in a more efficient operation without increasing the personnel collective dose.

___Yes _X_ No Will the proposed activity involve a significant unreviewed environmental impact?

The welding method (manual or automatic) for the canister closure welds does not affect any area of the plant site previously undisturbed for the ISFSI or require a revision to the ISFSI Environmental Impact Statement.

Summary: (For NRC Report, provide a brief overview)

The ISFSI USAR (Vol. I, Section 1.3.1.8) describes the Dry Shielded Canister weld closure on the shield plug and top cover plate as being performed by a fully remote, automatic welding system. This description is changed to allow manual welding for making closure welds and to substitute for the automatic welding equipment when it is temporarily unavailable. Manual welding can safely and efficiently replace the remote welding system for making closure welds, since resetting the automatic welding system is a more complex effort that results in similar occupational exposure to that obtained from performing the closure welds manually. The allowed duration of manual welding is limited by the ambient dose rates at the location of the welding. This will ensure that the personnel dose for the task does not significantly exceed the estimated dose in table 7.4-1 of the ISFSI USAR. This change does not constitute an unreviewed safety question, a significant increase in occupational exposure or an unreviewed environmental impact for the Independent Spent Fuel Storage Installation.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 1

This screening is for: ______10 CFR 50.59 Applicability __x__ 10 CFR 72.48 Applicability
(Check one regulation only)

______CCNPP __x__ISFSI
(Check one facility only)

(Check one activity type only)

______**Procedure:**	Procedure No./Change No.:__________
______**Temporary Alteration:**	Temporary Alteration No.:__________
______**Setpoint Change:**	SCAF No(s):__________
______**Modification:**	MCR/FCR/FEC No.:__________ FEC Supplement No.:__________
______	
______**Core Reload:**	Unit and Cycle:__________
__x__**UFSAR/USAR:**	UFSAR/USAR Change No.: 94-29
______**Other:**	Identify Activity Type:__________

Brief description of the activity:

To allow closure welds on the DSC shield plug and top cover plate to be made manually in addition to the automatic welding system. The manual welding is more efficient in some cases of closure welds and it could allow continuation or completion of welding operations when the automatic welding equipment is temporarily unavailable. This activity will involve a change to the ISFSI USAR Vol. I, Section 1.3.1.8, and Table 7.4-1.

Technical Specifications/License Conditions (10 CFR 50.59/72.48)

1.____YES __x__NO Is the proposed activity a change or will it cause a change to the Technical Specifications/License Conditions or Bases?

2.____YES __x__NO Will the proposed activity cause Structures, Systems or Components (SSCs) to be operated in a manner that violates the Technical Specifications/License Conditions or Bases?

If both answers are "No," continue with the screening. Justification for each "No" answer shall be provided. List the sections of the Technical Specifications/License Conditions that were reviewed.

Justification:

The change to the ISFSI USAR description of the automated closure welding operation of the Dry Shielded Canister to allow closure welds to be made manually instead of using the automatic remote welding system does not impact any technical specification. All final welds will meet the original ISFSI Tech. Spec. requirements.

Technical Specifications/License Condition Sections Reviewed:

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 2

Reviewed all sections of the ISFSI Technical Specification manual.

If either of the above answers is "Yes," complete a Safety Evaluation and consult CCI-143 for License Amendment Proposals.

CCNPP/ISFSI Facility (10 CFR 50.59/72.48)

1.__x__YES _____NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of the structure, system or component (SSC) directly affected by the activity?

If "No," answer each question below:

Why is the SAR description of the function of the SSC not affected?

Why is the SAR description of the method of performing the function of the SSC not affected?

Why is the SAR description of the design of the SSC not changed?

2.____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of any other SSC described in the SAR?

If "No," answer the following question:

Explain why the activity does not affect other SSCs described in the SAR..

The activity will allow the use of manual welding, in addition to the automatic welding system, for closure welds during the closure operation of the DSC. The manual weld will be made in accordance with the Welding Procedure Specification WPS P8-T or P8-T-LH (Manual) and must be nondestructively tested. The quality and integrity of the manual weld is as good as the weld placed by the automatic welder. This activity will not affect other SSCs described in the ISFSI USAR.

3.__x__YES ______NO Is the proposed activity a revision to the SAR. (Editorial changes are limited to obvious grammatical/spelling errors, reorganization of portions of the SAR or minor changes that do not affect the intent of the information conveyed by a drawing.)

4.__x__YES ______NO Will the proposed activity add to or delete from the SAR description of a SSC?

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 3

Procedures (10 CFR 50.59/72.48)

1.__x__YES _____NO Will the proposed activity affect the intent of any procedure described in the SAR (editorial changes do not need a Safety Evaluation)? The NRC staff does not consider procedures simply listed in the SAR to be described in the SAR. Also, procedures include anything that defines or describes activities or controls over functions, tasks, reviews, tests and safety review meetings.

2._____YES __x__NO Will the proposed activity cause SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: This activity will change the appropriate ISFSI procedures to allow for closure welds to be made manually in addition to using the automatic welding system. The manual weld will be made in accordance with the requirements of the Welding Procedure Specification WPS P8-T or P8-T-LH (Manual). The manual weld shall be of the same characteristics as the weld placed by the automatic welder. Therefore, manual welding shall not impact the design, function, or method of performing the function of the DSC, the top cover plate, or shield plug.

Tests or Experiments (10 CFR 50.59/72.48)

1._____YES __x__NO Will the proposed activity result in conducting a test or experiment causing SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: This activity is not a test or experiment.

ISFSI (10 CFR 72.48) These questions are only required to be answered for activities affecting ISFSI.

1.__x__YES ______NO Will the proposed activity increase any occupational dose for ISFSI related activities?

2._____YES __x__NO Will the proposed activity use additional property for ISFSI operations?

3._____YES __x__NO Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?

Justify each "No" answer below:

Justification: This activity allows manual welding for closure welds on the DSC top cover plate and shield plug which is performed in the Cask Wash Pit on the 69' level of the Auxiliary Building. No additional ISFSI property, changes to the road, or transport equipment is required or included in this activity.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 4

SAR Sections Reviewed:

Volumes I, IV, & V of the ISFSI USAR

If ALL answers are "No", A Safety Evaluation is not required.

If ANY answer is "Yes", A Safety Evaluation is required.

1.__x__YES ______NO Does this activity require additional screening?

10CFR 50.59 For Impact on CCNPP
10 CFR 72.48 For Impact on ISFSI

If "Yes", Perform a separate Safety Evaluation Screening.

Prepared By: Sam Shakir SAM SHAKIR Date: 8/30/94
PRINTED NAME AND SIGNATURE

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 1

This screening is for: __x__ **10 CFR 50.59 Applicability** _____ **10 CFR 72.48 Applicability**
(Check one regulation only)

__x__ **CCNPP** _____ **ISFSI**
(Check one facility only)

(Check one activity type only)

______**Procedure:**	Procedure No./Change No.:__________
______**Temporary Alteration:**	Temporary Alteration No.:__________
______**Setpoint Change:**	SCAF No(s):__________
______**Modification:**	MCR/FCR/FEC No.:__________ FEC Supplement No.:__________
______	
______**Core Reload:**	Unit and Cycle:__________
__x__**UFSAR/USAR:**	UFSAR/USAR Change No.: 94-29
______**Other:**	Identify Activity Type:__________

Brief description of the activity:

To allow closure welds on the DSC shield plug and top cover plate to be made manually in addition to the automatic welding system. The manual welding is more efficient in some cases of closure welds and it could allow continuation or completion of welding operations when the automatic welding equipment is temporarily unavailable. The welding operation takes place inside the Auxiliary Building.

Technical Specifications/License Conditions (10 CFR 50.59/72.48)

1.____YES __x__NO Is the proposed activity a change or will it cause a change to the Technical Specifications/License Conditions or Bases?

2.____YES __x__NO Will the proposed activity cause Structures, Systems or Components (SSCs) to be operated in a manner that violates the Technical Specifications/License Conditions or Bases?

If both answers are "No," continue with the screening. Justification for each "No" answer shall be provided. List the sections of the Technical Specifications/License Conditions that were reviewed.

Justification:

The description of the automated closure welding operation appears only in the ISFSI USAR and the ISFSI Tech. Spec. No such description appears in the UFSAR or the plant Technical Specification. Therefore, allowing closure welds to be done manually in addition to using the automatic remote welding system is strictly an ISFSI change and does not impact the plant Tech. Spec. All final welds will meet the original ISFSI Tech. Spec. requirements.

Technical Specifications/License Condition Sections Reviewed:

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 2

Reviewed all sections of the CCNPP Technical Specification, none are applicable to this activity.

If either of the above answers is **"Yes,"** complete a Safety Evaluation and consult CCI-143 for License Amendment Proposals.

CCNPP/ISFSI Facility (10 CFR 50.59/72.48)

1.____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of the structure, system or component (SSC) directly affected by the activity?

If "No," answer each question below:

Why is the SAR description of the function of the SSC not affected?

The activity has no impact on the function of the welded components (DSC, shield plug, and top plate). All these components are part of the ISFSI and are described in the ISFSI USAR. No SSCs described in the UFSAR are affected by this activity. Therefore, this activity does not affect the function of any SSCs in the Auxiliary Building.

.

Why is the SAR description of the method of performing the function of the SSC not affected?

This activity affects the welding closure operation of the DSC. This operation is only described in the ISFSI USAR but not in the UFSAR. Therefore, allowing some closure welding to be performed manually instead of using the automatic welding system has no impact on the method of performing the function of any SSCs in the Auxiliary Building.

Why is the SAR description of the design of the SSC not changed?

Allowing manual welding in the DSC closure operation is convenient and efficient. It does not affect the design of the DSC, which is an ISFSI component. No other SSCs in the Auxiliary Building, where the welding operation takes place, are affected by this activity.

2.____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of any other SSC described in the SAR?

If "No," answer the following question:

Explain why the activity does not affect other SSCs described in the SAR..

The activity will allow the use of manual welding, instead of the automatic welding system, for making welds during the closure operation of the DSC. The manual weld will be made in accordance with the Welding Procedure Specification WPS P8-T or P8-TLH (Manual) and must be nondestructively tested. The manual weld will be as good as the weld made by the automatic welder. No other SSCs are affected by this activity.

3.____YES __x__NO Is the proposed activity a revision to the SAR. (Editorial changes are limited to obvious grammatical/spelling errors, reorganization of portions of the SAR or minor changes that do not affect the intent of the information conveyed by a drawing.)

4._____YES __x__NO Will the proposed activity add to or delete from the SAR description of a SSC?

Procedures (10 CFR 50.59/72.48)

1.____YES __x__NO Will the proposed activity affect the intent of any procedure described in the SAR (editorial changes do not need a Safety Evaluation)? The NRC staff does not consider procedures simply listed in the SAR to be described in the SAR. Also, procedures include anything that defines or describes activities or controls over functions, tasks, reviews, tests and safety review meetings.

2._____YES __x__NO Will the proposed activity cause SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: The activity allows for closure welds to be done manually instead of using the automatic welding system. This change does not affect any procedures outlined in the UFSAR. The welds made by manual welding shall be of the same characteristics as the weld placed by the automatic welder. Therefore, manual welding shall not impact the design, function, or method of performing the function of any SSCs described in the UFSAR and located in the Auxiliary Building where the welding operation takes place.

Tests or Experiments (10 CFR 50.59/72.48)

1.____YES __x__NO Will the proposed activity result in conducting a test or experiment causing SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: This activity is not a test or experiment.

ISFSI (10 CFR 72.48) These questions are only required to be answered for activities affecting ISFSI.

1.____YES _____NO Will the proposed activity increase any occupational dose for ISFSI related activities?

2.____YES _____NO Will the proposed activity use additional property for ISFSI operations?

3.____YES _____NO Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?

Justify each "No" answer below:
Justification:

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 4

SAR Sections Reviewed:

Chapters 11 and 14 of the UFSAR. None are applicable to this activity.

If <u>ALL</u> answers are "No", A Safety Evaluation is not required.

If <u>ANY</u> answer is "Yes", A Safety Evaluation is required.

1. __x__ YES ______ NO Does this activity require additional screening?

10CFR 50.59 For Impact on CCNPP
10 CFR 72.48 For Impact on ISFSI

If "Yes", Perform a separate Safety Evaluation Screening.

Prepared By: Sam Shakir SAM SHAKIR Date: 8/30/94
PRINTED NAME AND SIGNATURE

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

NONMOD # 94-29

To: UFSAR Coordinator**Error! Bookmark not defined.**
From: Sam Shakir (Printed Name) Work Group CCSO Date 8/16/94
Phone Number: 2179 System Number 101

SECTION 1 *(Change Initiation)*
UFSAR CHANGE SOURCE DOCUMENT

FCR/FEC/MCR # ____ (Circle One) Safety Evaluation Log # 94-0-101-01

RDC ____ Procedure # ____

License Amendment # ____

Regulatory Generic Correspondence # ____ (Generic Letter, Bulletin or Information Notice)

Unit 1 ____ Unit 2 ____ Common ____ ISFSI X

DESCRIPTION OF UFSAR CHANGE:
1) Change Volume I, Section 1.3.1.8. to read:
"The DSC closure welds on the shield plug and the top cover plate are normally placed by a fully remote, automatic welding system. The system includes modular ... to remove the shield plug and top cover plate closure welds. Manual welding may be used for making closure welds and to substitute for automatic welding when the automatic welding equipment is temporarily unavailable. The allowed duration of manual welding is limited by the ambient dose rate at the location of the welding."

2) Change the description of the seal weld penetration plug task in Table 7.4-1 to read:
"Seal Weld Penetration Plug and Other Manual Welding" (see attached markup of table 7.4-1).

UFSAR SECTIONS AFFECTED: [Attach Marked up Page(s)]
Volume I, Section 1.3.1.8.
Table 7.4-1.

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

NON MOD # 94-29

SECTION 2 (Interdisciplinary Reviews)

RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature

RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature

RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature

SECTION 3 (Implementation Verification Prior to UFSAR Incorporation)

VERIFICATION THAT PLANT MODIFICATION OR AS-BUILT INFORMATION HAS BEEN IMPLEMENTED:

☐ Partial Implementation

(For changes which have been partially implemented, identify the completed portion of the change on the marked-up UFSAR pages. If implementation is complete on one unit only, check the appropriate box, below.)

☐ Unit 1 ☐ Unit 2

RESPONSIBLE ENGINEER: ______________________ DATE: __________

SECTION 4 (Final Review/Approval Prior to UFSAR Incorporation)

FINAL REVIEW & APPROVAL OF THIS CHANGE:

RESPONSIBLE ENGINEER: Sam Shakir SAM SHAKIR DATE: 8/30/94

RESP. ENGR'S. SUPERVISOR: BSS for M. TAYLOR per Telecon DATE: 8/30/94

UFSAR COORDINATOR: ______________________ DATE: __________

PE-LICENSING UNIT OR WGL: ______________________ DATE: __________

Table 7.4-1

Estimated Occupational Exposure for One HSM Load
Page 1 of 2
[See Reference 7.11]

Operation	Number of Personnel	Effective Time in Radiation Field (hours)	Average Distance from Source (feet)	Ambient Dose Rate (mrem/hr)	Dose Per Worker (mrem)	Total Personnel Dose (mrem)
LOCATION: Fuel Pool						
Load Fuel into DSC	4	10.00	30.0	2.0	20.0	80.0
LOCATION: Cask Decon Pit						
Decontaminate Outer Surface of Cask	2	1.00	1.5	83.6	83.6	167.2
Decontaminate Shield Plug and Exposed DSC Shell	1	1.00	1.5	41.4	41.4	41.4
Lower Water Level in DSC Cavity	2	0.25	4.0	10.4	2.6	5.2
Set up Automatic Welder to Weld Lead Plug to DSC	2	0.25	1.5	41.4	10.4	20.7
Perform Dye Penetrant Examination	1	1.50	1.5	41.4	62.1	62.1
Remove Remaining Water and Vacuum Dry DSC Cavity	2	1.00	4.0	10.4	10.4	20.8
Drain Cask/DSC Annulus	2	0.25	1.5	83.6	20.9	41.8
Backfill DSC Cavity with Helium	2	0.25	4.0	75.3	18.8	37.7
Perform Helium Leak Test	1	0.50	1.5	130.6	65.3	65.3
Seal Weld Penetration Plug AND OTHER MANUAL WELDING	1	0.50	1.5	130.6	65.3	65.3
Perform Examination On Penetration Plug Welds	1	0.25	1.5	130.6	32.7	32.7
Install Top Cover Plate	2	0.25	1.5	66.7	16.7	33.4
Set Up Automatic Welder To Weld Top Cover Plate To DSC	2	0.25	1.5	66.7	16.7	33.4

CHANGE

of the DSC to the HSM. Both solid neutron and lead gamma shielding are incorporated into the transfer cask design. Figure 1.3-2 shows the major components of the transfer cask. The Calvert Cliffs transfer cask has a solid hydrogenous neutron shield in the outer annulus of the cask, and as a result the liquid neutron shield expansion tank of Reference 1.2 is deleted.

| 1.3.1.4 Transfer Trailer [See Reference 1.4]

The transfer trailer is used to transport the transfer cask skid and the loaded transfer cask from the Auxiliary Building to the ISFSI. The transfer trailer is an industrial heavy-haul trailer with pneumatic tires, hydraulic suspension and steering, and brakes on all wheels. Four hydraulic jacks are incorporated into the transfer trailer design to provide vertical elevation adjustment for alignment of the cask at the HSM. The transfer trailer is shown in Figure 1.3-3. It is pulled by a conventional tractor.

1.3.1.5 Transfer Cask Skid and Positioning System

The transfer cask skid is essentially identical in design and operation to previous NUHOMS-24P system transfer cask support skids. The skid is supported on lubricated bearing plates attached to the trailer deck and can be moved horizontally on the bearing plates by the hydraulic actuators of the skid positioning system. The skid is secured to the trailer deck in a travel lock position during cask loading and transport operations. The transfer cask skid is shown in Figure 1.3-4.

1.3.1.6 Hydraulic Ram System

The hydraulic ram consists of a double acting hydraulic cylinder with a capacity of 80,000 lb. in either push or pull and stroke of 21 feet. The ram will be supported during operation by a frame assembly attached to the bottom of the transfer cask and a tripod assembly resting on the concrete slab. The operational loads of the hydraulic ram are grounded through the transfer cask. The hydraulic ram system includes a grapple at the end of the piston which is used to engage a grapple ring on the DSC for retrieval operations. Figure 1.3-5 shows the hydraulic ram system.

1.3.1.7 Vacuum Drying System

The vacuum drying system removes water and air from the DSC and fills it with helium. The vacuum drying system has four operational modes: water removal, helium forced water removal, vacuum pumping, and helium backfilling.

1.3.1.8 Automated Closure Welding System

The DSC closure welds on the shield plug and the top cover plate are placed by a fully remote, automatic welding system. The system includes modular components and is designed for rapid setup. Welding operations are remotely controlled by an operator who views the progress of the weld through closed circuit television. The welding head is designed to permit rapid replacement with either a UT probe, or a plasma gouging torch which can be used to remove the shield plug and top cover plate closure welds.

CHANGE

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Storage of empty DSC's at Calvert Cliffs ISFSI **50.59 Log No.____ or 72.48 Log. No. 94-0-101-002**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

___YES _X_ NO Involve an Unreviewed Safety Question (USQ)?
___YES _X_ NO Involve a change to the Technical Specifications/License Conditions or Bases?
_X_ YES ____ NO Require a change or addition to the UFSAR or USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

___YES _X_ NO Involve a Significant Increase in Occupational Dose?
___YES _X_ NO Involve a Significant Unreviewed Environmental Impact?

Sam Shakir
Prepared by: SAM SHAKIR Department: CCSo Date: 8/2/94
PRINTED NAME AND SIGNATURE (VECTRA)

_X_ YES ___ NO Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye PRINTED NAME	Resp. Ind.: J.B. MAKAR PRINTED NAME	Resp. Ind.: Robert H. Beall PRINTED NAME
[signature] SIGNATURE	[signature] SIGNATURE	[signature] SIGNATURE
Work Group: Licensing	Work Group: System Engineer	Work Group: Fuels Management
Date: 8/10/94	Date: 8-05-94	Date: 8/10/94

Approved ✓ Disapproved ___	Approved ✓ Disapproved ___
Signature Sam Shakir for Moses Taylor INDEPENDENT REVIEWER (VECTRA) Per Tele-con.	Signature Michael J. Gahan GS-DES ~~GS-TSEE, or PE-PDSU~~ M.J. GAHAN 9.20.94 JW CCSO 8/10/94
Date 8/4/94	Date

The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 94-145 Date: 9-28-94

Recommend Approval ✓ Recommend Disapproval____ Signature [signature] Date 9-28-94
POSRC CHAIRMAN

Approved ✓ Disapproved____ Signature [signature] Date 9/28/94
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.
OSSRC Meeting No.: 95-003 Date:________

Recommend Approval____ Recommend Disapproval____ Signature____________ Date________
OSSRC CHAIRMAN

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Storage of Empty DSC's at Calvert Cliffs ISFSI **50.59 Log No.____ or 72.48 Log. No.** 94-0-101-002

Proposed Activity:
This activity evaluates the effects of using the Independent Spent Fuel Storage Installation (ISFSI) site for storage of new empty Dry Shielded Canisters (DSCs) horizontally on cribbing inside the security fence which surrounds that area. The DSCs are Stainless Steel cylindrical shells that when filled provide confinement of radioactive spent fuel. The DSCs and spent fuel are transferred from the Spent Fuel Pool and stored in the concrete Horizontal Storage Modules (HSMs) at the ISFSI site. The orientation of the stored empty DSCs will be such that their ends are in the north-south direction facing the HSMs. The empty DSCs will be stored at a distance away from the HSMs enough to allow for normal spent fuel transportation and storage activities. The activity will result in the following change to the ISFSI USAR to allow the storage of these empty DSCs:
Add the following to Volume I, Section 4.1.1: "The ISFSI site may be utilized for storage of empty DSCs. The empty DSCs may be stored there until they are needed for spent fuel loading and permanent storage. The empty DSCs will be stored horizontally on wood cribbing with their ends facing north-south at a distance from the HSMs to allow for normal spent fuel transportation and storage activities."

Reason for Activity:.
The 20 empty canisters available at Calvert Cliffs require storage until they can be used in the transfer and storage of spent fuel. The ISFSI site provides a convenient and secure laydown storage area for these empty canisters until they are utilized.

Function (s) of affected SSC:
The HSMs at the ISFSI house spent fuel in DSCs and provide physical protection for the canisters, radiation shielding and flow paths for natural circulation heat dissipation.
SAR Sections Reviewed: ISFSI SAR Vol. I, Sections 1.2.1, 4.1.1, 8.2.2.2 and 8.2.7.

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

____Yes _X_ No May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Storage of empty DSCs at the ISFSI site does not affect the function of the ISFSI or the HSMs. There is no interaction between the stored empty canisters and the HSMs at the ISFSI. The ability of the modules to perform their physical protection, heat removal and shielding function is not affected by the presence of the stored empty canisters at the ISFSI site. In addition, storage of the DSCs will be in accordance with the plant criteria for storage of safety related components. Therefore, the probability of a malfunction of equipment important to safety previously evaluated in the SAR is not increased.

___Yes _X_ No May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

No malfunctions are associated with temporary storage of empty canisters at the ISFSI site as described in the proposed activity.

____Yes _X_ No May the probability of occurrence of an accident previously evaluated in the SAR be increased?

The only potential accident associated with storage of empty canisters at the ISFSI site is the possible dislodging of the canisters such that one or more could roll towards an HSM that contains stored fuel and

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Storage of Empty DSCs at Calvert Cliffs ISFSI **50.59 Log No.____ or 72.48 Log. No. 94-0-101-002**

block the inlet vents or damage the module by its impact. Since the empty canisters are oriented such that they would have to turn 90° to roll toward the modules, such an event is unlikely. Also, the possible contact angles between the canister and the module range from 0° to 90°. At 0° the canister contacts the module tangentially. At 90° the end of the canister contacts the module. Since the diameter of the canister is less than the width of the module inlet vent, there is no contact angle which allows the canister to completely block the module inlet vent. The probability of an accident evaluated in the ISFSI SAR is therefore not increased.

____Yes _X_ No May the consequences of an accident previously evaluated in the SAR be increased?

The consequences of the above stated potential accidents associated with storage of empty canisters at the ISFSI site are not increased for the following reasons:
a. If an empty canister finds its way to an HSM and partially blocks a vent, this condition is covered in the design basis analysis of the HSMs (Ref. USAR Section 8.2.7). The design basis analysis assumes that the vent is completely blocked up to 48 hours. Having a canister as the object blocking the vent does not affect the ability to move it within 48 hours. Such a condition will be identified within 24 hours by the required daily survailance of the ISFSI site.
b. The design basis for evaluating the HSM resistance to a massive impact load is a 3967 pound automobile with a 20 square foot frontal area traveling at a speed of 184.8 ft/sec impacting the side wall of an HSM. This results in a kinetic energy of 2,100,000 ft-lbs. To obtain the equivalent kinetic energy with a 34,330 pound empty canister would require a velocity of approximately 35 mph (Ref. BG&E calculation No. C-93-356). Such velocity is not possible to obtain since the DSCs are stored at approximately 30-150 feet away from the HSMs. It is, therefore, impossible for a DSC to turn 90° and accelerate to 35 mph across level gravel to impact the HSMs.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not increased.

____Yes _X_ No May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

There is no interaction between the empty canisters stored at the ISFSI site and the HSMs. Since the heavy weight of the empty canisters and the position of their storage does not allow them to accidentally roll and impact the HSMs, there is no possibility for a malfunction of a different type than any evaluated previously in the SAR being created.

____Yes _X_ No May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

The accidents considered in the SAR bound all potential accidental interactions between the stored empty canisters and the HSMs. No possibility of a new accident type is therefore created.

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Storage of Empty DSCs at Calvert Cliffs ISFSI **50.59 Log No.____ or 72.48 Log. No. 94-0-101-002**

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any Technical Specification is not reduced.

___Yes _X_ No Will the margin of safety as defined in the basis for any Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
N/A	No Technical Specifications are affected by the proposed activity

Complete for 72.48:

___Yes _X_ No Will the proposed activity involve a significant increase in occupational dose?

Table 7.4-1 of the ISFSI USAR Vol. I provides personnel dose estimates for fuel storage tasks. The task of storing and retrieving the empty DSCs from the ISFSI site will have negligible occupational dose since the DSCs are stored at a distance away from the location of the HSMs. Any occupational dose resulting from this activity is covered by the ISFSI USAR which allows daily inspection of the site by security personnel.

___Yes _X_ No Will the proposed activity involve a significant unreviewed environmental impact?

Because the conditions created by the storage of the empty canisters inside the ISFSI fenced area are bounded by the current safety analysis, this activity will not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

The site of the Independent Spent Fuel Storage Installation (ISFSI) is being used to store empty Dry Shielded Canisters (DSCs) horizontally on cribbing. The empty DSCs are positioned such that their ends are in the north-south direction facing the Horizontal Storage Modules (HSMs) where spent fuel is stored. The existing safety analysis documented in the ISFSI SAR bounds all possible interactions between the stored empty canisters and the HSMs at the ISFSI. These include the potential for the empty canisters to dislodge from their cribbing, roll towards the concrete modules and impact them or partially block the cooling vents that provide passive ventilation for decay heat removal from these modules. Therefore, the storage of empty DSCs inside the fenced security area of the ISFSI does not constitute an unreviewed safety question, a significant increase in occupational exposure, nor an unreviewed environmental impact for the ISFSI.

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

NONMOD # 94-28

To: UFSAR Coordinator
From: Sam Shakir (Printed Name) Work Group CCSO Date 8/4/94
Phone Number: 2179 System Number 101

SECTION 1 *(Change Initiation)*
UFSAR CHANGE SOURCE DOCUMENT

FCR/FEC/MCR # ______ (Circle One) Safety Evaluation Log # 94-0-101-02

RDC ______ Procedure # ______

License Amendment # ______

Regulatory Generic Correspondence # ______ (Generic Letter, Bulletin or Information Notice)

Unit 1 ____ Unit 2 ____ Common ____ ISFSI X

DESCRIPTION OF UFSAR CHANGE:
1) Add the following to the end of the second paragraph in Volume I, Section 4.1.1:
"The ISFSI site may be utilized for storage of empty DSCs. The empty DSCs may be stored there until they are needed for spent fuel loading and permanent storage. The empty DSCs will be stored horizontally on wood cribbing with their ends facing north-south at a distance from the HSMs to allow for normal spent fuel transportation and storage activities."

UFSAR SECTIONS AFFECTED: [Attach Marked up Page(s)]
Volume I, Section 4.1.1

CCI-177
Rev. B/Change 0

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

SECTION 2 (Interdisciplinary Reviews)

RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature
RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature
RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature

SECTION 3 (Implementation Verification Prior to UFSAR Incorporation)

VERIFICATION THAT PLANT MODIFICATION OR AS-BUILT INFORMATION HAS BEEN IMPLEMENTED:

☐ Partial Implementation

(For changes which have been partially implemented, identify the completed portion of the change on the marked-up UFSAR pages. If implementation is complete on one unit only, check the appropriate box, below.)

☐ Unit 1 ☐ Unit 2

RESPONSIBLE ENGINEER: ______________________ DATE: ______

SECTION 4 (Final Review/Approval Prior to UFSAR Incorporation)

FINAL REVIEW & APPROVAL OF THIS CHANGE:

RESPONSIBLE ENGINEER: Sam Shakir SAM SHAKIR DATE: 8/4/94

RESP. ENGR'S. SUPERVISOR: Sam Shakir for M. Taylor PER TELE CON. DATE: 8/4/94

UFSAR COORDINATOR: ______________________ DATE: ______

PE-LICENSING UNIT OR WGL: ______________________ DATE: ______

4.0 INSTALLATION DESIGN

4.1 SUMMARY DESCRIPTION

4.1.1 LOCATION AND LAYOUT OF THE INSTALLATION

The location and layout of the Calvert Cliffs ISFSI with respect to other plant site structures is shown in Figure 4.1-1. This figure also denotes the route for transport of the transfer cask carrying DSCs from the Auxiliary Building to the ISFSI.

The initial construction phase of the ISFSI will include four 2x6 HSM arrays which will store up to 48 DSCs; each DSC contains 24 fuel assemblies. Additional HSM storage capacity will be added incrementally up to a total of ten 2x6 HSM arrays as needed. Figure 4.1-2 shows the arrangement of the storage arrays. ADD SEE PG.1

The area around the ISFSI will be sloped to direct surface drainage to collection ditches for channeling rain water away from the site. As noted in Section 2.4, the ISFSI is about 86 feet above the probable maximum flood elevation. Local intense rainfall is not a problem since the resulting flood water would need to rise at least 18 inches above yard grade in order to block the HSM air inlets. (This height represents the bottom of the air inlet penetration on the inside of the air inlet plenum.) Adequate surface drainage exists at the ISFSI yard to assure that water will not collect to a depth of any concern.

The chosen transport route has been reviewed and is found to be in compliance with the design criteria of the transfer cask drop analysis discussed in Section 8.2 of the NUHOMS-24P Topical Report (Reference 4.1). Furthermore, the transport route has been reviewed to assure that no roadways, subgrade structures, buried pipes or trenches will be damaged by the transport trailer wheel loads. The approach slab has adequate space for turning the transport trailer and tow vehicle. No other turning areas are needed along the transport route.

4.1.2 PRINCIPAL FEATURES

4.1.2.1 Site Boundary

The property owned by BG&E surrounding the Calvert Cliffs ISFSI is shown in Figure 4.1-3.

4.1.2.2 Controlled Area [See Reference 4.5]

The controlled area for the ISFSI, as defined by 10 CFR 72.106, is identified in Figure 4.1-3. Its border from the HSM array is a minimum of 3900 feet (1189 meters) as shown in Figure 4.1-3.

4.1.2.3 Site Utility Supplies and Systems

No utility systems are required for the storage phase of the ISFSI. Electrical power will be provided to operate the hydraulic pumps used during DSC insertion or withdrawal operations at the HSM, and for lighting and security systems. No water or sewer systems are necessary. The existing plant page system will be extended to provide telephone and paging communications.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 1

This screening is for: ______10 CFR 50.59 Applicability __x__ 10 CFR 72.48 Applicability
(Check one regulation only)

______CCNPP __x__ISFSI
(Check one facility only)

(Check one activity type only)

______**Procedure:**	Procedure No./Change No.:__________
______**Temporary Alteration:**	Temporary Alteration No.:__________
______**Setpoint Change:**	SCAF No(s):__________
______**Modification:**	MCR/FCR/FEC No.:__________ FEC Supplement No.:__________
______	
______**Core Reload:**	Unit and Cycle:__________
__X__**UFSAR/USAR:**	UFSAR/USAR Change No.: 94-28
______**Other:**	Identify Activity Type:__________

Brief description of the activity:
The activity allows the storage of empty Dry Shielded Canisters (DSCs) horizontally on wood cribbing inside the security fence of the ISFSI site. The stored empty DSCs will be positioned such that their ends are in the north-south direction facing the Horizontal Storage Modules (HSMs) at a distance away from the HSMs to allow for normal spent fuel transportation and storage activities. The ISFSI site provides a secure and convenient storage area for the empty DSCs until they are loaded with spent fuel from the spent fuel pool and stored in the HSMs.

Technical Specifications/License Conditions (10 CFR 50.59/72.48)

1.____YES __x__NO Is the proposed activity a change or will it cause a change to the Technical Specifications/License Conditions or Bases?

2.____YES __x__NO Will the proposed activity cause Structures, Systems or Components (SSCs) to be operated in a manner that violates the Technical Specifications/License Conditions or Bases?

If both answers are "No," continue with the screening. Justification for each "No" answer shall be provided. List the sections of the Technical Specifications/License Conditions that were reviewed.
Justification:

There are no Tech. Spec. requirements that are violated by this activity, nor would the activity require a change to the ISFSI Tech. Spec. Storage of empty DSCs inside the ISFSI site will not affect the fuel handling and storage operation.

Technical Specifications/License Condition Sections Reviewed:

Reviewed all section of the ISFSI Tech. Spec.

If either of the above answers is "Yes," complete a Safety Evaluation and consult CCI-143 for License Amendment Proposals.

CCNPP/ISFSI Facility (10 CFR 50.59/72.48)

1._____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of the structure, system or component (SSC) directly affected by the activity?

If "No," answer each question below:

Why is the SAR description of the function of the SSC not affected?

The function of the DSCs is to provide mechanical confinement and containment for the stored spent fuel assemblies. DSCs loaded with spent fuel are inserted in the HSMs at the ISFSI site. Storage of the empty DSCs inside the fence at the ISFSI site occurs when the DSCs are not performing their intended function and, therefore, has no impact on their function.

Why is the SAR description of the method of performing the function of the SSC not affected?

Storage of the empty DSCs inside the fence at the ISFSI site occurs when the DSCs are not performing their intended function. The DSCs perform their function by providing confinement for the spent fuel assemblies in a sealed environment, so the spent fuel can be transferred from the Auxiliary Building to the ISFSI and stored inside the Horizontal Storage Modules. Therefore, storing the empty DSCs before they are utilized for fuel storage has no affect on the way these DSCs perform their function.

Why is the SAR description of the design of the SSC not changed?

The DSCs are high integrity stainless steel, welded pressure vessels that provide confinement for the stored fuel assemblies. The DSCs are designed to provide radiological shielding and physical protection during the loading operation and storage. Allowing some empty DSCs to be stored inside the ISFSI site, when they are not performing their intended function, has no impact on the design of these components.

2.____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of any other SSC described in the SAR?

If "No," answer the following question:

Explain why the activity does not affect other SSCs described in the SAR..

Storage of the empty DSCs does not affect the HSMs located in the ISFSI site. The empty DSCs will be stored such that the long axis of their cylindrical body is perpendicular to the face of the HSMs, and at a distance away from the HSMs enough to allow normal spent fuel transportation and loading activities. There is no interaction between the empty canisters and the HSMs. The heavy weight of the canisters and the position of their storage does not allow them to accidentally roll and impact the HSMs. No other SSCs are affected by this activity.

3.__x__YES ______NO Is the proposed activity a revision to the SAR. (Editorial changes are limited to obvious grammatical/spelling errors, reorganization of portions of the SAR or minor changes that do not affect the intent of the information conveyed by a drawing.)

4.__x__YES ______NO Will the proposed activity add to or delete from the SAR description of a SSC?

Procedures (10 CFR 50.59/72.48)

1.____YES ___x__NO Will the proposed activity affect the intent of any procedure described in the SAR (editorial changes do not need a Safety Evaluation)? The NRC staff does not consider procedures simply listed in the SAR to be described in the SAR. Also, procedures include anything that defines or describes activities or controls over functions, tasks, reviews, tests and safety review meetings.

2._____YES ___x__NO Will the proposed activity cause SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: The storage of empty DSCs in the ISFSI site does not affect any procedures described in the ISFSI USAR. Storing the empty DSCs when they are not performing their intended function has no impact on their design, function, or method of performing their function as described in the ISFSI USAR.

Tests or Experiments (10 CFR 50.59/72.48)

1._____YES ___x__NO Will the proposed activity result in conducting a test or experiment causing SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: This activity is not a test or experiment.

ISFSI (10 CFR 72.48) These questions are only required to be answered for activities affecting ISFSI.

1._____YES ___x__NO Will the proposed activity increase any occupational dose for ISFSI related activities?

2._____YES ___x__NO Will the proposed activity use additional property for ISFSI operations?

3._____YES ___x__NO Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?

Justify each "No" answer below:

Justification: Storage and retrieval of the empty DSCs from the ISFSI site does not affect the occupational dose for ISFSI related activities, nor does it impact the spent fuel storage operation. Storage of the DSC's will be inside the ISFSI security fence and will not use any additional property, change the roads, or change the transport equipment.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 4

SAR Sections Reviewed:

Volumes I & IV of the ISFSI USAR

If **ALL** answers are "No", A Safety Evaluation is not required.

If **ANY** answer is "Yes", A Safety Evaluation is required.

1._____YES ___x__NO Does this activity require additional screening?

10CFR 50.59 For Impact on CCNPP
10 CFR 72.48 For Impact on ISFSI

If "Yes", Perform a separate Safety Evaluation Screening.

Prepared By: SAM SHAKIR Sam Shakir Date: 8/4/94
PRINTED NAME AND SIGNATURE

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No.____ or 72.48 Log No. 94-0-101-003

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

___YES _X_ NO Involve an Unreviewed Safety Question (USQ)?
___YES _X_ NO Involve a change to the Technical Specifications/License Conditions or Bases?
_X_YES ___ NO Require a change or addition to the UFSAR or USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

___YES _X_ NO Involve a Significant Increase in Occupational Dose?
___YES _X_ NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: Sam Shakir SAM SHAKIR Department: CCSO Date: 8/2/94
PRINTED NAME AND SIGNATURE (VECTRA)

_X_YES ___ NO Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: J.B. MAKAR (PRINTED NAME)	Resp. Ind.: G. Tesfaye (PRINTED NAME)	Resp. Ind.:______ (PRINTED NAME)
[signature] SIGNATURE	[signature] SIGNATURE	______ SIGNATURE
Work Group: System Engineer	Work Group: Licensing Unit	Work Group:______
Date: 8-5-94	Date: 9-20-94	Date:______

Approved ✓ Disapproved ___	Approved ✓ Disapproved ___
Signature Sam Shakir for Moses Taylor Per Tele. Con. INDEPENDENT REVIEWER (VECTRA)	Signature Michael J. Gahan GS-DES, GS-TSES, or PE-PDSU M. J. GAHAN 9.20.94 [initials] CCEU 8/10/94
Date: 8/4/94	Date:______

The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 94-145 Date: 9-28-94

Recommend Approval ✓ Recommend Disapproval___ Signature [signature] Date: 9-28-94
POSRC CHAIRMAN

Approved ✓ Disapproved___ Signature [signature] Date: 9/28/94
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.
OSSRC Meeting No.: 95-003 Date:______

Recommend Approval___ Recommend Disapproval___ Signature______ Date:______
OSSRC CHAIRMAN

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No.____ or 72.48 Log No. 94-0-101-003

Proposed Activity:
This activity changes the requirements for the ISFSI transfer route to allow the shoulders to be up to 20" lower than the centerline elevation of the road surface. This activity results in changing the ISFSI USAR as follows:

1) Change USAR Volume IV, Section 2 USAR Q&A, Question 8.0-5 Response, first paragraph to read:

"The transfer cask will be transported along an asphalt or concrete paved road which is at least 16 feet wide and which has shoulders which extend to make the transfer route at least 28 feet wide. The road is approximately 3,300 linear feet with grades which range from 0% to 3% except for an approximate 50 foot length which carries a 5.7% grade. The roadbed is level except for a negligible 1% slope required to create a crown in the road for drainage and a transverse slope at any point along the transportation route of less than 10%. The shoulders are either level with the road, or slope down from the road such that the maximum vertical distance from the centerline of the road to the lowest point within the 28 foot wide transfer route is 20 inches. In those locations where the paved road abuts up to existing blacktop, or concrete paving, the shoulder is discontinued. The shoulder may be paved, gravel or soil and contain typical roadside fixtures, including curbs, fences, guard rails and light poles which do not constitute potential puncture mechanisms for the cask during a drop. The shoulders do not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture mechanism during a cask drop. For the entire route that the transfer cask is transported there will exist a minimum 8 foot wide zone on each side of the trailer that is not more than 20 inches below the road centerline elevation."

2) Change USAR Volume I, Section 10.3.4.1, Item B. Specifications, first paragraph to read:

"The roadway or ground surface elevation perpendicular to the route to or from the ISFSI within an 8.0 ft proximity of the transfer trailer shall not be more than 20 inches below the trailer road surface centerline elevation. The paved portion of the road shall be a minimum of 16 feet wide and the adjacent paved, gravel or soil shoulder shall extend to make the transfer route at least 28 feet wide. The lowest point within the 28 foot wide transfer route shall not be lower than 20 inches below the road centerline and may contain typical roadside fixtures, including curbs, fences, guard rails and light poles which do not constitute potential puncture mechanisms for the cask. The shoulders may not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture mechanism. The road shall be closed to other vehicles when transporting the spent fuel."

Reason for Activity:
The current ISFSI USAR description of the transfer route and shoulders is unnecessarily restrictive regarding the allowable elevation of the shoulder surface relative to the transfer road surface and the relative width of the paved road and the adjacent shoulders. The current description of the road specifies the elevation of the shoulder surface to be not less than that of the trailer road surface centerline elevation. This description is restrictive considering that the shoulders are affected by heavy rain and at times get eroded and washed away requiring constant repair. The significance of the shoulder elevation is to limit the drop height of the cask to its designed limit of 80 inches. Since the maximum distance from the bottom of the transfer cask to the road centerline is 56.25 inches, this allows the lowest point on the transfer route to be up to 20 inches below the elevation of the road centerline without affecting the design basis of 80 inches. The current description of the shoulders width is also restrictive. The ISFSI USAR describes the shoulders as being a minimum of 7 feet wide on each side of the road. This will now be changed to specify a total width of the transfer route including shoulders at a minimum of 28 feet.

Function (s) of affected SSC:
Transport road provides a hard paved surface for the tractor to transport spent fuel in a NUHOMS®-24P canister/transfer cask from the Auxiliary Building to the ISFSI.

ISFSI USAR Sections Reviewed:
Vol.. IV, Section 2; Vol. I, Section 4.1.1; Vol. I, Section 10.3

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No.____ or 72.48 Log No. 94-0-101-003

Complete for 50.59 and 72.48:

1. The probability of occurence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

____Yes _X_ No May the probability of ocurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

The function of the canister and cask during transfer operations is not affected by the proposed changes since they do not cause the cask to exceed the design basis drop height of 80 inches. (Ref. BG&E Calc. C-91-75, C-91-76, & C-93-325)

____Yes _X_ No May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

The consequences of a malfunction are not affected by the proposed changes since there are no malfunctions associated with these changes.

____Yes _X_ No May the probability of occurrence of an accident previously evaluated in the SAR be increased?

The probability of a drop accident from above the 80 inches design basis drop height is not increased because the physical dimensions of the cask and trailer and associated transport equipment prevent the cask from exceeding a height of 80 inches if the maximum difference in elevation from the centerline of the road and lowest point on the shoulder is limited to 20 inches. Drop accidents for a Dry Shielded Canister (DSC) loaded with fuel in a transfer cask have been analyzed and can be sustained without unacceptable damage to the cask and DSC for heights up to 80 inches above a thick hard surface.

____Yes _X_ No May the consequences of an accident previously evaluated in the SAR be increased?

No accidents or consequences are associated with the proposed changes in allowable transportation route configuration since the proposed changes do not cause the cask to exceed the design basis drop accident height of 80 inches.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not increased.

____Yes _X_ No May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Any malfunction of the transfer cask would be associated with a drop from a height greater than 80 inches. Since the proposed changes do not result in this condition, the possibility of a new malfunction is not created.

____Yes _X_ No May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

The proposed changes affect transport of spent fuel inside the Dry Shielded Canister using the transfer cask, an analyzed condition. Since the bounding case envelopes the proposed activities, no possibility of a new accident is created.

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No.____ or 72.48 Log No. 94-0-101-003

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any Technical Specification is not reduced.

___Yes _X_ No Will the margin of safety as defined in the basis for any Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
2.3	Section 2.3 states that the Transfer Cask lifting height outside the Auxiliary Building shall not exceed 80 inches. In addition, in the event of a transfer cask drop from a height greater than 15 inches, action to inspect must be taken.
	The maximum distance from the bottom of the transfer cask to the road centerline is 56.25 inches. Allowing the lowest point on the transfer route to be up to 20 inches below the elevation of the road centerline would limit the possible drop height for the cask to 76.25 inches which is below the design basis 80 inches.

Complete for 72.48:

___Yes _X_ No Will the proposed activity involve a significant increase in occupational dose?

The proposed changes do not cause the transfer cask to be placed in an unanalyzed condition. They do not therefore affect the occupational exposure for the ISFSI.

___Yes _X_ No Will the proposed activity involve a significant unreviewed environmental impact?

Since the transfer route road and shoulder configuration as described by the proposed changes is bounded by the current safety analysis, it does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

A transport road provides a hard paved surface for a tractor to transport spent fuel in a NUHOMS®-24P canister/transfer cask from the Auxiliary Building to the Independent Spent Fuel Storage Installation (ISFSI).
The ISFSI USAR description of the transfer route road and shoulders was changed to avoid being unnecessarily restrictive regarding the allowable elevation of the shoulder surface relative to the transfer road surface and the relative width of the paved road and the adjacent shoulders. The proposed change allows the road shoulder surface within the 28 foot wide transfer route to be up to 20 inches below the road centerline rather than at or above the road surface. The proposed change also specifies the road configuration in terms of minimum requirements for the relative width of road and shoulder surfaces rather than specific relative widths. This change does not constitute an unreviewed safety question, a change to the Technical Specifications or Bases, a significant increase in occupational exposure or an unreviewed environmental impact for the ISFSI.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 1

This screening is for: ______ **10 CFR 50.59 Applicability** __x__ **10 CFR 72.48 Applicability**
(Check one regulation only)

______ **CCNPP** __x__ **ISFSI**
(Check one facility only)

(Check one activity type only)

______ **Procedure:** Procedure No./Change No.:__________

______ **Temporary Alteration:** Temporary Alteration No.:__________

______ **Setpoint Change:** SCAF No(s):__________

______ **Modification:** MCR/FCR/FEC No.:__________
FEC Supplement No.:__________

______ **Core Reload:** Unit and Cycle:__________

__x__ **UFSAR/USAR:** UFSAR/USAR Change No.: 94-30

______ **Other:** Identify Activity Type:__________

Brief description of the activity:

Change the ISFSI USAR current description of the transfer route and shoulders which is unnecessarily restrictive regarding the allowable elevation of the shoulder surface relative to the transfer road surface and the relative width of the paved road and adjacent shoulders. The route is used for transporting the cask/canister assembly between the Auxiliary Building and the ISFSI.

Technical Specifications/License Conditions (10 CFR 50.59/72.48)

1. _____YES __x__ NO Is the proposed activity a change or will it cause a change to the Technical Specifications/License Conditions or Bases?

2. _____YES __x__ NO Will the proposed activity cause Structures, Systems or Components (SSCs) to be operated in a manner that violates the Technical Specifications/License Conditions or Bases?

If both answers are **"No,"** continue with the screening. Justification for each **"No"** answer shall be provided. List the sections of the Technical Specifications/License Conditions that were reviewed.
Justification:

Changing the ISFSI USAR description of the transfer road does not affect any technical specification.

Technical Specifications/License Condition Sections Reviewed:

Reviewed all sections of the ISFSI Technical Specification manual.

If either of the above answers is **"Yes,"** complete a Safety Evaluation and consult CCI-143 for License Amendment Proposals.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 2

CCNPP/ISFSI Facility (10 CFR 50.59/72.48)

1.__x__YES _____NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of the structure, system or component (SSC) directly affected by the activity?

If "No," answer each question below:

Why is the SAR description of the function of the SSC not affected?

Why is the SAR description of the method of performing the function of the SSC not affected?

Why is the SAR description of the design of the SSC not changed?

2.____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of any other SSC described in the SAR?

If "No," answer the following question:

Explain why the activity does not affect other SSCs described in the SAR..

Changing the ISFSI USAR description of the transfer road does not affect other SSCs in the plant or the ISFSI.

3.__x__YES ______NO Is the proposed activity a revision to the SAR. (Editorial changes are limited to obvious grammatical/spelling errors, reorganization of portions of the SAR or minor changes that do not affect the intent of the information conveyed by a drawing.)

4.__x__YES ______NO Will the proposed activity add to or delete from the SAR description of a SSC?

Procedures (10 CFR 50.59/72.48)

1.____YES __x__NO Will the proposed activity affect the intent of any procedure described in the SAR (editorial changes do not need a Safety Evaluation)? The NRC staff does not consider procedures simply listed in the SAR to be described in the SAR. Also, procedures include anything that defines or describes activities or controls over functions, tasks, reviews, tests and safety review meetings.

2.____YES __x__NO Will the proposed activity cause SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 3

Justify each "No" answer below:

Justification: The activity changes the description of the transfer route in the ISFSI USAR and does not affect any procedures or change the method of transporting the cask between the Auxiliary Building and the ISFSI.

Tests or Experiments (10 CFR 50.59/72.48)

1.____YES __x__NO Will the proposed activity result in conducting a test or experiment causing SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: This activity is not a test or experiment.

ISFSI (10 CFR 72.48) These questions are only required to be answered for activities affecting ISFSI.

1.____YES __x__NO Will the proposed activity increase any occupational dose for ISFSI related activities?

2.____YES __x__NO Will the proposed activity use additional property for ISFSI operations?

3.__x__YES ____NO Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?

Justify each "No" answer below:

Justification: Changing the road description in the ISFSI USAR does not impact the method of performing the transport and storage operation of the spent fuel and therefore, does not increase the occupational dose for any of the ISFSI related activities nor does it require the use of additional property for ISFSI operations.

SAR Sections Reviewed:

Volumes I & IV of the ISFSI USAR

If **ALL** answers are "No", A Safety Evaluation is not required.

If **ANY** answer is "Yes", A Safety Evaluation is required.

1.__x__YES ____NO Does this activity require additional screening?

10CFR 50.59 For Impact on CCNPP
10 CFR 72.48 For Impact on ISFSI

If "Yes", Perform a separate Safety Evaluation Screening.

Prepared By: SAM SHAKIR Sam Shakir Date: 8/4/94

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 1

This screening is for: __x__ 10 CFR 50.59 Applicability ____ 10 CFR 72.48 Applicability
(Check one regulation only)

__x__ CCNPP _____ ISFSI
(Check one facility only)

(Check one activity type only)

______ **Procedure:**	Procedure No./Change No.:
______ **Temporary Alteration:**	Temporary Alteration No.:
______ **Setpoint Change:**	SCAF No(s):
______ **Modification:**	MCR/FCR/FEC No.: FEC Supplement No.:
__x__ **UFSAR/USAR:**	UFSAR/USAR Change No.: 94-30
______ **Core Reload:**	Unit and Cycle:
______ **Other:**	Identify Activity Type:

Brief description of the activity:

Change the ISFSI USAR current description of the transfer route and shoulders which is unnecessarily restrictive regarding the allowable elevation of the shoulder surface relative to the transfer road surface and the relative width of the paved road and adjacent shoulders. The route is used for transporting the cask/canister assembly between the Auxiliary Building and the ISFSI.

Technical Specifications/License Conditions (10 CFR 50.59/72.48)

1._____ YES __x__ NO Is the proposed activity a change or will it cause a change to the Technical Specifications/License Conditions or Bases?

2._____ YES __x__ NO Will the proposed activity cause Structures, Systems or Components (SSCs) to be operated in a manner that violates the Technical Specifications/License Conditions or Bases?

If both answers are **"No,"** continue with the screening. Justification for each **"No"** answer shall be provided. List the sections of the Technical Specifications/License Conditions that were reviewed.
Justification:

Changing the ISFSI USAR description of the transfer road does not affect any technical specification. No sections in the U1 or U2 Tech. Spec. is applicable.

Technical Specifications/License Condition Sections Reviewed:

Reviewed all sections of the U1 and U2 Tech. Spec.

If either of the above answers is **"Yes,"** complete a Safety Evaluation and consult CCI-143 for License Amendment Proposals.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 2

CCNPP/ISFSI Facility (10 CFR 50.59/72.48)

1._____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of the structure, system or component (SSC) directly affected by the activity?

If "No," answer each question below:

Why is the SAR description of the function of the SSC not affected?

The affected SSC is the transport road which provides a hard paved surface to transport the NUHOMS®-24P canister/transfer cask from the Auxiliary Building to the ISFSI. This activity does not affect this described function. The description of this road is only included in the ISFSI USAR and not in the UFSAR.

Why is the SAR description of the method of performing the function of the SSC not affected?

The UFSAR has no description of the transport road from the Auxiliary to the ISFSI. This activity changes the road's description in the ISFSI USAR (see 72.48 evaluation log No. 94-0-101-003) and does not affect the function or the method of performing the function of the road.

Why is the SAR description of the design of the SSC not changed?

The road is designed to withstand the loads from the tractor that transports the canister/transfer cask assembly from the Auxiliary Building to the ISFSI. The description of the road design exists in the ISFSI USAR only and not in the UFSAR (see 72.48 evaluation log No. 94-0-101-003). No other design description is affected by this activity.

2.____YES ___x___NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of any other SSC described in the SAR?

If "No," answer the following question:

Explain why the activity does not affect other SSCs described in the SAR..

This activity changes the ISFSI road description provided only in the ISFSI USAR. It does not affect the function or the method of performing the function of the road or any other SSCs described in the SAR.

3.____YES ___x___NO Is the proposed activity a revision to the SAR. (Editorial changes are limited to obvious grammatical/spelling errors, reorganization of portions of the SAR or minor changes that do not affect the intent of the information conveyed by a drawing.)

4._____YES ___x___NO Will the proposed activity add to or delete from the SAR description of a SSC?

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 3

Procedures (10 CFR 50.59/72.48)

1.____YES __x__NO Will the proposed activity affect the intent of any procedure described in the SAR (editorial changes do not need a Safety Evaluation)? The NRC staff does not consider procedures simply listed in the SAR to be described in the SAR. Also, procedures include anything that defines or describes activities or controls over functions, tasks, reviews, tests and safety review meetings.

2.____YES __x__NO Will the proposed activity cause SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: This activity does not affect any SSCs described in the UFSAR. The transfer of fuel from the Auxiliary Building to the ISFSI is outlined in the ISFSI USAR (see 72.48 evaluation No. 94-0-101-003). Changing the description of the road in the ISFSI USAR does not affect any procedures or the method of transporting the fuel on the road.

Tests or Experiments (10 CFR 50.59/72.48)

1.____YES __x__NO Will the proposed activity result in conducting a test or experiment causing SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: This activity is not a test or experiment.

ISFSI (10 CFR 72.48) These questions are only required to be answered for activities affecting ISFSI.

1.____YES ____NO Will the proposed activity increase any occupational dose for ISFSI related activities?

2.____YES ____NO Will the proposed activity use additional property for ISFSI operations?

3.____YES ____NO Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?

Justify each "No" answer below:

Justification:

SAR Sections Reviewed:

Volumes I & IV of the ISFSI USAR

If **ALL** answers are "No", A Safety Evaluation is not required.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 4

If <u>ANY</u> answer is "Yes", A Safety Evaluation is required.

1.__x__YES ______NO Does this activity require additional screening?

10CFR 50.59 For Impact on CCNPP
10 CFR 72.48 For Impact on ISFSI

If "Yes", Perform a separate Safety Evaluation Screening.

Prepared By: SAM SHAKIR Sam Shakir Date: 8/4/94
PRINTED NAME AND SIGNATURE

CCI-177
Rev. B/Change 0

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

NONMOD # 94-30

To: UFSAR Coordinator
From: SAM SHAKIR (PRINTED NAME) Work Group CCSO Date 8/03/94
Phone Number: 2179 System Number 101

SECTION 1 (Change Initiation)

UFSAR CHANGE SOURCE DOCUMENT

FCR/FEC/MCR # ______ (Circle One)
Safety Evaluation Log # 94-0-101-003

RDC ______
Procedure # ______

License Amendment # ______

Regulatory Generic Correspondence # ______ (Generic Letter, Bulletin or Information Notice)

Unit 1 ____ Unit 2 ____ Common ____ ISFSI X

DESCRIPTION OF UFSAR CHANGE:

1) Change Volume IV, Section 2 ISFSI USAR Q&A, Question 8.0-5 Response, first paragraph to read:

"The transfer cask will be transported along an asphalt or concrete paved road which is at least 16 feet wide and which has shoulders which extend to make the transfer route at least 28 feet wide. The road is approximately 3,300 linear feet with grades which range from 0% to 3% except for an approximate 50 foot length which carries a 5.7% grade. The roadbed is level except for a negligible 1% slope required to create a crown in the road for drainage and a transverse slope at any point along the transportation route of less than 10%. The shoulders are either level with the road, or slope down from the road such that the maximum vertical distance from the centerline of the road to the lowest point within the 28 foot wide transfer route is 20 inches. In those locations where the paved road abuts up to existing blacktop, or concrete paving, the shoulder is discontinued. The shoulder may be paved, gravel or soil and contain typical roadside fixtures, including curbs, fences, guard rails and light poles which do not constitute potential puncture mechanisms for the cask during a drop. The shoulders do not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture mechanism during a cask drop. For the entire route that the transfer cask is transported there will exist a minimum 8 foot wide zone on each side of the trailer that is not more than 20 inches below the road centerline elevation."

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

94-30

2) Change Volume I, ISFSI USAR Section 10.3.4.1, Item B. Specifications, first paragraph to read:

"The roadway or ground surface elevation perpendicular to the route to or from the ISFSI within an 8.0 ft proximity of the transfer trailer shall not be more than 20 inches below the trailer road surface centerline elevation. The paved portion of the road shall be a minimum of 16 feet wide and the adjacent paved, gravel or soil shoulder shall extend to make the transfer route at least 28 feet wide. The lowest point within the 28 foot wide transfer route shall not be lower than 20 inches below the road centerline and may contain typical roadside fixtures, including curbs, fences, guard rails and light poles which do not constitute potential puncture mechanisms for the cask. The shoulders may not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture mechanism. The road shall be closed to other vehicles when transporting the spent fuel."

UFSAR SECTIONS AFFECTED: (Attach Marked up Page(s))
ISFSI USAR Volume IV, Section 2 SAR Q&A, Question 8.0-5 Response, first paragraph
ISFSI USAR Volume I, Section 10.3.4.1, Item B. Specifications, first paragraph

CCI-177
Rev. B/Change 0

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

94-30

SECTION 2 (Interdisciplinary Reviews)

RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature
RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature
RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature

SECTION 3 (Implementation Verification Prior to UFSAR Incorporation)

VERIFICATION THAT PLANT MODIFICATION OR AS-BUILT INFORMATION HAS BEEN IMPLEMENTED:

☐ Partial Implementation

(For changes which have been partially implemented, identify the completed portion of the change on the marked-up UFSAR pages. If implementation is complete on one unit only, check the appropriate box, below.)

☐ Unit 1 ☐ Unit 2

RESPONSIBLE ENGINEER: ______________________ DATE: __________

SECTION 4 (Final Review/Approval Prior to UFSAR Incorporation)

FINAL REVIEW & APPROVAL OF THIS CHANGE:

RESPONSIBLE ENGINEER: Sam Shakir DATE: 8/03/94

RESP. ENGR'S. SUPERVISOR: Sam Shakir for M. Taylor Per Telecon DATE: 8/04/94

UFSAR COORDINATOR: ______________________ DATE: __________

PE-LICENSING UNIT OR WGL: ______________________ DATE: __________

RESPONSE TO NRC COMMENTS ON THE
CALVERT CLIFFS NUCLEAR POWER PLANT ISFSI SAR

Section 8

QUESTION: 8.0-5

Para 8.2.5.

As stated in Section 2.1.1.1 of the CCNPP ISFSI ER, the minimum elevation difference between the ISFSI site and the plant site is 70 feet. Although statements are made in Sections 4.1.1 and 10.3.4.1 regarding the acceptability of the transportation route for the TC, provide more details on this road with specifics on the grading around the road and special provisions to ensure that the TC is not dropped greater than the 80 inches analyzed in the SAR during its transport over a 70 feet elevation gradient to the ISFSI site. What provisions will be made during the transport of the DSC to preclude the TC from rolling backwards on the slopped portion of the route in the event that the engine and brakes of the prime moving vehicle fail?

RESPONSE: (Revised by a 10 CFR 72.48 Safety Evaluation Process; Pacific Nuclear File Nos. BG001.0051.01 and BG001.0051.03.)

CHANGE

The transfer cask will be transported along an asphalt or concrete paved road which is 16 feet wide and has 7 to 8 feet shoulders. The road is approximately 3,300 linear feet with slopes which range from 0% to 3% except for an approximate 50 feet length which carries a 5.7% slope. The roadbed is level except for a negligible 1% slope required to create a crown in the road for drainage and a transverse slope at any point along the transportation route of less than 10%. The shoulders are either level with the road or slope up from the road. In those locations where the paved road abuts up to existing blacktop, or concrete paving, the shoulder is discontinued. The shoulder may be paved, gravel or soil and contain typical roadside fixtures, including curbs, fences, guard rails and light poles which do not constitute potential puncture devices for the cask during a drop. The shoulders do not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture device during a cask drop. For the entire route that the transfer cask is transported there will exist a minimum 8 feet wide zone that is at or above the roadbed elevation.

The transfer trailer braking system is not operable independent of the prime mover. However, failure of the prime mover will cause the trailer braking system to fail-safe, that is "lock tight".

10.3.4 LIMITING AND OPERATING CONDITIONS FOR TRANSFER CASK CONTAINING LOADED DSC

10.3.4.1 Transfer Route Selection [See Reference 10.2]

A. Title: Transfer Route Selection

B. Specifications: The roadway or ground surface elevation perpendicular to the route to or from the ISFSI within an 8.0 ft proximity of the transfer trailer shall not be less than that of the trailer road surface elevation as measured at the outer edge of asphalt pavement. The paved portion of the road shall be a minimum of 16 feet wide and the adjacent paved, gravel or soil shoulder shall be a minimum of 7 feet wide on each side of the road. The shoulder shall be level with or higher than the outer edge of the pavement and may contain typical roadside fixtures, including curbs, fences, guard rails and light poles which do not constitute potential puncture devices for the cask. The shoulders may not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture device. The road shall be closed to other vehicles when transporting the spent fuel.

CHANGE

The maximum drop height of the cask from the transfer trailer to the roadbed does not exceed 80 inches.

C. Applicability: This specification is applicable to DSC transfer utilizing the NUHOMS-24P transfer cask and trailer.

D. Objective: Ensure that a potential drop height of 80 inches is not exceeded.

E. Action: Repair the road to its proper elevation.

F. Surveillance: Prior to the transfer of a DSC to or from an HSM, the proposed transfer route shall be visually inspected.

G. Bases: A drop from a height of 80 inches or less does not compromise the design margins of the transfer cask or DSC.

ATTACHMENT 3, SAFETY EVALUATION FORM

Page 1 of 5

ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No.____ or 72.48 Log No. 94-0-101-004

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

___YES _X_ NO	Involve an Unreviewed Safety Question (USQ)?
___YES _X_ NO	Involve a change to the Technical Specifications/License Conditions or Bases?
_X_ YES ___ NO	Require a change or addition to the UFSAR or USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

___YES _X_ NO	Involve a Significant Increase in Occupational Dose?
___YES _X_ NO	Involve a Significant Unreviewed Environmental Impact?

Prepared by: Sam Shakir Sam Shakir Department: CCSO Date: 7/13/94
PRINTED NAME AND SIGNATURE (VECTRA)

_X_ YES ___ NO Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: Robert H. Beall (PRINTED NAME)	Resp. Ind.:______ (PRINTED NAME)	Resp. Ind.:______ (PRINTED NAME)
Robt H. Beall (SIGNATURE)	______ (SIGNATURE)	______ (SIGNATURE)
Work Group: Fuel Management	Work Group:______	Work Group:______
Date: 7/13/94	Date:______	Date:______

Approved ✓ Disapproved ___	Approved ✓ Disapproved ___
Signature Sam Shakir FOR IAN McGINNIS PER TELECON. (INDEPENDENT REVIEWER (VECTRA))	Signature Michael J. Gahan 7.13.94 (GS-DES, GS-ISES, or PE-PDSU) FOR J. Nugley 7/13/94 CCSO
Date 7/13/94	Date ______

The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 94-118 Date: 7-13-94

Recommend Approval ✓ Recommend Disapproval____ Signature [signature] Date: 7-13-94
POSRC CHAIRMAN

Approved ✓ Disapproved____ Signature [signature] Date: 7/13/94
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.
OSSRC Meeting No.: 95-003 Date:________

Recommend Approval____ Recommend Disapproval____ Signature____________ Date:________
OSSRC CHAIRMAN

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change **50.59 Log No.____ or 72.48 Log No.** 94-0-101-004

Proposed Activity:
This activity will support the new ISFSI fuel loading procedure (ISFSI-01) to allow the use of pressurized air or helium for liquid removal from the DSC cavity during the DSC drying operation. The vendor Tech. Manual already allows the use of either air or helium for this operation. This change will require the following ISFSI UFSAR changes:

1) Change Volume I, Section 1.3.1.7 to read:
"The vacuum drying system removes water and air from the DSC and fills it with helium. The vacuum drying system has four operational modes: water removal, helium or air forced water removal, vacuum pumping, and helium backfilling."

2) Change Volume I, Section 1.3.1.9 item I. to read:
"Air or helium lines are connected to the DSC vent port and the water inside the canister is forced out the siphon tube by pressurized air or helium."

3) Change Volume I, Section 4.3.1 to read:
"The VDS is designed to operate in four modes: liquid removal by pump, liquid removal by a source of pressurized helium or air, vacuum drying, and helium backfill. The evacuation is performed.........still present in the DSC."

4) Change Volume I, Section 5.1.1.3 to read:
"Connect the VDS to the DSC. Open the cask drain port valve and remove the remaining water from the cask/DSC annulus. Remove the remaining water from the DSC cavity by engaging the compressed helium supply or a compressed air source through the helium inlet connection and opening the valve to the DSC vent port, forcing the water from the DSC through the siphon port."

Reason for Activity:
To allow the use of pressurized air or helium for liquid removal from the ISFSI Dry Shielded Canister (DSC) by the Vacuum Drying System (VDS). The drying operation of the DSC using the VDS is carried out in four stages. The first stage removes liquid from the DSC by pumping. The second stage removes the remaining liquid from the DSC by pressurization using a compressed gas. The third stage is to vacuum dry the DSC, and the fourth and final stage is to backfill the DSC with helium. The change only affects the second stage of the operation where a large quantity of compressed gas is needed to remove the remaining liquid from the DSC. Permitting the use of pressurized air has two benefits. First, it will save a significant amount of helium needed for the blowdown of liquid, and second it will not release this volume of helium into the atmosphere of the surrounding Spent Fuel Pool area. The increased helium concentration may be detected by the helium leak detector used for measuring leakage from the DSC inner cover plate closure weld. The presence of helium in the air could result in a delay of the final acceptance of the DSC closure operation until the helium concentration is removed by the Auxiliary Building ventilation system.

Function (s) of affected SSC:
The DSC provides containment and confinement of the spent fuel during storage. The drying operation of the DSC using the VDS, provides the appropriate atmospheric environment for long term dry fuel storage in the DSC. The DSC is classified as Safety Related. The VDS provides a means for removing water and air from the DSC and for backfilling the DSC with helium. This function is required to ensure that fuel is stored in an inert atmosphere, and to take advantage of the heat transfer properties of helium. The VDS is classified as NSR.

ISFSI USAR Sections Reviewed:
Vol. I, Section 1.3.1.7, Vol. I, Section 1.3.1.9, Vol. I, Section 3.1.2.3, Vol. I, Section 4.3.1, Vol. I, Section 5.1.1.3. , ISFSI Tech. Spec. Section 2.2

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: <u>**Calvert Cliffs ISFSI USAR Change**</u> **50.59 Log No._____ or 72.48 Log No.** <u>**94-0-101-004**</u>
<u>Complete for 50.59 and 72.48:</u>

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

___Yes _X_ No May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

The function of the Dry Shielded Canister as a containment and confinement barrier is not affected by the use of pressurized air in lieu of compressed helium during liquid removal from the DSC. The pressurized air will perform the same function as compressed helium to force the liquid out of the DSC, and to prepare the DSC for the following two final stages of vacuum drying and helium backfilling. Therefore, the probability of a malfunction is not increased by the proposed change.

___Yes _X_ No May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

The consequences of a malfunction are not affected by the proposed changes since there are no malfunctions associated with these changes. The presence of air inside the DSC cavity for the short duration of the DSC drying operation will not cause any corrosive activity or degradation in the fuel cladding. The air will be removed from the DSC and replaced with helium by the VDS prior to full closure of the DSC to provide the required inert environment for long term dry storage of the fuel. There are no safety concerns associated with the malfunction of the non safety related VDS. A malfunction of the VDS will only result in a delay of the the DSC closure operation.

___Yes _X_ No May the probability of occurrence of an accident previously evaluated in the SAR be increased?

The probability of an accident in which the containment and confinement boundary formed by the DSC is breached is not increased by the proposed change. The use of pressurized air or helium to force the liquid out of the DSC during the drying operation is not relevant to the probability of an accident since the DSC will still be vacuum dried to remove the air and backfilled with helium before the vent and siphon ports are plugged and welded closed to fully seal the helium filled DSC.

___Yes _X_ No May the consequences of an accident previously evaluated in the SAR be increased?

Since there is no immediate accident scenario associated with the DSC drying operation, the consequences of an accident involving the DSC are not affected by the use of pressurized air or compressed helium for blowdown of the liquid from the DSC enclosure.

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: **Calvert Cliffs ISFSI USAR Modification** **50.59 Log No.____ or 72.48 Log No. 94-0-101-004**

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not increased.

___Yes _X_ No May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

No new malfunctions can be caused by the use of pressurized air in lieu of helium for liquid removal from the DSC. The pressurized air will be supplied by the plant air system. The supplied air will be locally filtered with coalescing filter units rated at 99.9% efficiency to remove extremely small liquid water droplets, oil droplets, and particulates. The maximum oil or hydrocarbon contents of the air will not exceed one part per million for 0.1 micron particulates after filtration. This filtration will provide air quality equal to that used for instrument air. This quality of air is adequate to perform this operation. The insignificant amount of hydrocarbon particulates entering the DSC will be further reduced during the vacuum drying stage. Vacuum drying removes the air from the DSC cavity prior to backfilling it with helium to provide the required inert atmosphere for storage of the fuel. Since the DSC will contain the same final atmosphere required for the long term fuel storage and be sealed in the same manner described previously in the ISFSI USAR, no new malfunctions are created by these changes.

OSS
7/13/94

___Yes _X_ No May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

No new accidents can be caused by the use of pressurized air in lieu of helium to remove the liquid from the DSC enclosure. The worst accident condition analyzed in the ISFSI USAR occurs when the fuel is stored in a vacuum canister. This condition results in a peak fuel cladding temperature of 393° C which is well below the limit of 570° C. When surrounded by air for a short period of time, the fuel cladding temperature will be well below 393° C. ISFSI-01 (fuel loading procedure) will provide verification sign off steps to ensure that only helium, and not air, is used in the backfilling operation to provide the required inert atmosphere for storage of the fuel.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any Technical Specification is not reduced.

___Yes _X_ No Will the margin of safety as defined in the basis for any Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
2.2	This section specifies the DSC vacuum steady pressure during canister vacuum drying stage to be less than 3 torr to ensure that all liquid water has evaporated. It also specifies the helium backfill pressure to be 2.5 psig ± 2.5 psi. These pressure limits are not affected by the use of pressurized air in lieu of helium for removal of liquid from the DSC. Vacuum drying and helium backfilling are two operations performed after the liquid removal is completed, and therefore, are not related nor affected by the type of gas used in the liquid removal stage. The margin of safety is therefore not reduced.

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: **Calvert Cliffs ISFSI USAR Change** **50.59 Log No.____ or 72.48 Log No. 94-0-101-004**

Summary: (For NRC Report, provide a brief overview)

Complete for 72.48:

___Yes _X_ No Will the proposed activity involve a significant increase in occupational dose?

The use of pressurized air in lieu of helium to force the liquid out of the DSC cavity prior to vacuum drying it and backfilling it with helium does not affect the occupational dose. Table 7.4-1 of Vol. I of the ISFSI USAR gives the estimated dose rates associated with water removal and vacuum drying the DSC cavity (20.8 mrem total personnel dose). This dose rate will not be affected by the above changes.

___Yes _X_ No Will the proposed activity involve a significant unreviewed environmental impact?

The use of pressurized air in lieu of helium for liquid removal from the DSC cavity has no adverse environmental impact nor does it affect the ISFSI Environmental Impact Statement. The Auxiliary Building processing systems are used during the DSC purge and drying operations. During this operation, the liquid and gases (air or helium) purged from the DSC cavity are routed to the Auxiliary Building processing systems or the spent fuel pool.

The ISFSI USAR (Vol. I, Sections 1.3.1.7, 1.3.1.9, 4.3.1, 5.1.1.3) describes the operation of the ISFSI Vacuum Drying System (VDS), which is used to remove water and air from the DSC and replaces it with helium. The system is designed to operate in four modes: liquid removal by pumping, helium forced liquid removal, vacuum pumping, and helium backfilling. This description is changed to allow pressurized air to be used in lieu of helium in the second mode of liquid removal from the DSC cavity. After liquid is forced out by the pressurized air, the DSC will be vacuum dried to remove the air and vapors, and then backfilled with helium to provide the required inert environment for long term fuel clad integrity, as described in the ISFSI USAR. Using air instead of helium to blowdown the water from the DSC cavity, limits the use of helium to the backfilling operation. This results in less use of this gas, and eliminates the presence of it in the atmosphere of the Spent Fuel Area. Helium in the atmosphere could interfere with the function of the closure weld leak detector that is designed to detect helium leakage from the welds of the sealed DSC. The use of pressurized air instead of helium for liquid removal from the DSC cavity does not constitute an unreviewed safety question, a significant increase in occupational exposure nor an unreviewed environmental impact for the Independent Spent Fuel Storage Installation.

CCI-177
Rev. B/Change 0

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

NONMOD # 94-035

To: UFSAR Coordinator
From: Sam Shakir (PRINTED NAME) Work Group CCSO Date 7/8/94
Phone Number: x2179 System Number 101

SECTION 1 (Change Initiation)

UFSAR CHANGE SOURCE DOCUMENT

FCR/FEC/MCR # ______ (Circle One)
Safety Evaluation Log # 94-0-101-004
RDC ______ Procedure # ______
License Amendment # ______
Regulatory Generic Correspondence # ______ (Generic Letter, Bulletin or Information Notice)

Unit 1 ____ Unit 2 ____ Common ____ ISFSI X

DESCRIPTION OF UFSAR CHANGE:

1) Change Volume I, Section 1.3.1.7 to read:
"The vacuum drying system removes water and air from the DSC and fills it with helium. The vacuum drying system has four operational modes: water removal, helium or air forced water removal, vacuum pumping, and helium backfilling."

2) Change Volume I, Section 1.3.1.9 item I. to read:
"Air or helium lines are connected to the DSC vent port and the water inside the canister is forced out the siphon tube by pressurized air or helium."

3) Change Volume I, Section 4.3.1 to read:
"The VDS is designed to operate in four modes: liquid removal by pump, liquid removal by a source of pressurized helium or air, vacuum drying, and helium backfill. The evacuation is performed.........still present in the DSC."

4) Change Volume I, Section 5.1.1.3 to read:
"Connect the VDS to the DSC. Open the cask drain port valve and remove the remaining water from the cask/DSC annulus. Remove the remaining water from the DSC cavity by engaging the compressed helium supply or a compressed air source through the helium inlet connection and opening the valve to the DSC vent port, forcing the water from the DSC through the siphon port."

UFSAR SECTIONS AFFECTED: (Attach Marked up Page(s))

ISFSI USAR Volume I, Sections 1.3.1.7, 1.3.1.9, 4.3.1, 5.1.1.3.

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

SECTION 2 (Interdisciplinary Reviews)

RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature

RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature

RESP. IND. ______________________ WORK GROUP: ______________________
Printed Name and Signature

SECTION 3 (Implementation Verification Prior to UFSAR Incorporation)

VERIFICATION THAT PLANT MODIFICATION OR AS-BUILT INFORMATION HAS BEEN IMPLEMENTED:

☐ Partial Implementation

(For changes which have been partially implemented, identify the completed portion of the change on the marked-up UFSAR pages. If implementation is complete on one unit only, check the appropriate box, below.)

☐ Unit 1 ☐ Unit 2

RESPONSIBLE ENGINEER: ______________________ DATE: __________

SECTION 4 (Final Review/Approval Prior to UFSAR Incorporation)

FINAL REVIEW & APPROVAL OF THIS CHANGE:

RESPONSIBLE ENGINEER: Jon N. Woodfield Jon N Woodfield DATE: 7/8/94

RESP. ENGR'S. SUPERVISOR: Michael J. Gahan III DATE: 7.8.94
MICHAEL J. GAHAN, III

UFSAR COORDINATOR: ______________________ DATE: __________

PE-LICENSING UNIT OR WGL: ______________________ DATE: __________

of the DSC to the HSM. Both solid neutron and lead gamma shielding are incorporated into the transfer cask design. Figure 1.3-2 shows the major components of the transfer cask. The Calvert Cliffs transfer cask has a solid hydrogenous neutron shield in the outer annulus of the cask, and as a result the liquid neutron shield expansion tank of Reference 1.2 is deleted.

1.3.1.4 Transfer Trailer [See Reference 1.4]

The transfer trailer is used to transport the transfer cask skid and the loaded transfer cask from the Auxiliary Building to the ISFSI. The transfer trailer is an industrial heavy-haul trailer with pneumatic tires, hydraulic suspension and steering, and brakes on all wheels. Four hydraulic jacks are incorporated into the transfer trailer design to provide vertical elevation adjustment for alignment of the cask at the HSM. The transfer trailer is shown in Figure 1.3-3. It is pulled by a conventional tractor.

1.3.1.5 Transfer Cask Skid and Positioning System

The transfer cask skid is essentially identical in design and operation to previous NUHOMS-24P system transfer cask support skids. The skid is supported on lubricated bearing plates attached to the trailer deck and can be moved horizontally on the bearing plates by the hydraulic actuators of the skid positioning system. The skid is secured to the trailer deck in a travel lock position during cask loading and transport operations. The transfer cask skid is shown in Figure 1.3-4.

1.3.1.6 Hydraulic Ram System

The hydraulic ram consists of a double acting hydraulic cylinder with a capacity of 80,000 lb. in either push or pull and stroke of 21 feet. The ram will be supported during operation by a frame assembly attached to the bottom of the transfer cask and a tripod assembly resting on the concrete slab. The operational loads of the hydraulic ram are grounded through the transfer cask. The hydraulic ram system includes a grapple at the end of the piston which is used to engage a grapple ring on the DSC for retrieval operations. Figure 1.3-5 shows the hydraulic ram system.

1.3.1.7 Vacuum Drying System

The vacuum drying system removes water and air from the DSC and fills it with helium. The vacuum drying system has four operational modes: water removal, helium or air forced water removal, vacuum pumping, and helium backfilling.

1.3.1.8 Automated Closure Welding System

The DSC closure welds on the shield plug and the top cover plate are placed by a fully remote, automatic welding system. The system includes modular components and is designed for rapid setup. Welding operations are remotely controlled by an operator who views the progress of the weld through closed circuit television. The welding head is designed to permit rapid replacement with either a UT probe, or a plasma gouging torch which can be used to remove the shield plug and top cover plate closure welds.

1.3.1.9 System Operation

The primary operations, in sequence of occurrence, for the Calvert Cliffs system are shown schematically in Figure 1.3-6 and are described below:

A. Transfer Cask Preparation - Cask preparation includes exterior washdown and interior decontamination if necessary.

B. DSC Preparation - The canisters are thoroughly cleaned.

C. DSC/Transfer Cask Loading - The empty DSC is inserted into the transfer cask using the Spent Fuel Cask Handling Crane and lifting lugs provided on the DSC. Proper angular alignment is achieved through the use of alignment marks on the cask and each DSC.

D. Transfer Cask Lifting and Placement in the Spent Fuel Pool - The annulus between the DSC and cask is filled with demineralized water and sealed with an inflatable seal to prevent contamination of the DSC outer surface by the pool water. Prior to placing the cask in the spent fuel pool, the DSC is filled with fuel pool water to prevent an inrush of water when the cask is lowered into the pool. The cask and DSC are then lowered into the pool.

E. DSC Fuel Loading - Twenty-four spent fuel assemblies are loaded into the DSC basket. These assemblies will be preselected to control reactivity and decay heat using the administrative controls on burnup, initial enrichment, and post-irradiation decay time as detailed in Section 10.2.5.

F. DSC Shield Plug Placement - With the transfer cask and loaded DSC resting in the fuel pool, the DSC shield plug is lowered into place using the Spent Fuel Cask Handling Crane.

G. Transfer Cask Lifting Out of the Pool - The transfer cask and loaded DSC are lifted out of the spent fuel pool and placed in the cask washdown pit using the Spent Fuel Cask Handling Crane. The transfer cask and DSC cover are then decontaminated.

H. DSC Sealing - Initially the water level in the DSC/transfer cask annulus is lowered approximately 5-10 inches. The inflatable seal is removed and swipes are taken over the DSC exterior at the DSC upper surface and around the circumference. The water level in the DSC is lowered to just below the inner surface of the shield plug and a seal weld is made between the shield plug and the DSC shell. This weldment provides the primary closure for the DSC.

I. Transfer Cask/DSC Drying - Air or Helium lines are connected to the DSC vent port and the water inside the canister is forced out the siphon tube by pressurized air or helium. The water in the transfer cask annulus is also drained. The water is returned to the spent fuel pool or routed to Auxiliary Building processing systems. The DSC vent line is then used to draw a vacuum to facilitate drying until the DSC moisture content meets the applicable limits.

J. Helium Filling - In order to ensure that no fuel and/or cladding oxidation occurs during storage, the DSC is filled with helium after evacuation.

4.3 AUXILIARY SYSTEMS

The ISFSI is a self-contained, passive storage facility which requires no auxiliary systems.

4.3.1 VENTILATION AND OFF-GAS SYSTEMS

Spent fuel confined in storage at the ISFSI is cooled by conduction and radiation within the DSC, and conduction, convection, and radiation from the DSC surface. An air inlet near the bottom of the HSM front wall and outlets in the HSM roof allow convective cooling by natural circulation. The driving force for this ventilation system is described in Section 8.1.3. No auxiliary ventilation is used or required at the ISFSI. Fuel loading and DSC closure operations take place in the plant's Auxiliary Building and make use of the ventilation system in that facility. Auxiliary Building ventilation is discussed in Section 9.8.2.3 of Reference 4.2.

The Vacuum Drying System (VDS) provides a means for removing water and water vapor from the DSC and for backfilling the DSC with helium. This function is required to ensure that fuel is stored in an inert atmosphere, and to take advantage of the favorable heat transfer properties of helium.

removal by a source of pressurized helium or air

The VDS is designed to operate in four modes: liquid removal by pump, liquid removal by helium pressure, vacuum drying, and helium backfill. The evacuation is performed in several stages to allow the DSC pressure to stabilize. When the pressure can be held at 3 torr for at least 30 minutes, the cavity is then backfilled with helium. After again pumping the cavity down to 3 torr, a final helium backfill is made and the DSC is sealed. This process further reduces the partial pressure of any water vapor still present in the DSC.

4.3.2 ELECTRICAL SYSTEMS

No electrical systems are required for the HSM or DSC during long term storage, other than for lighting and security system power. Electrical power is used during DSC closure operations in the plant's Auxiliary Building and during DSC transfer operations to the HSM at the ISFSI. The required electrical power in the Auxiliary Building will be obtained from the existing plant system. Power at the ISFSI will be supplied from a retail source.

4.3.3 AIR SUPPLY SYSTEMS

No air supply system is required. Compressed helium will be used to force water from the DSC during closure operations.

4.3.4 STEAM SUPPLY AND DISTRIBUTION SYSTEM

There are no steam systems required.

4.3.5 WATER SUPPLY SYSTEM

Borated water will be used to fill the DSC cavity prior to insertion into the spent fuel pool. The water source will be compatible with the plant's existing spent fuel pool. The source of supply may be the pool itself. Demineralized water is needed for filling the DSC/cask annulus, and for washdown operations.

one of the assemblies selected for storage from the fuel rack and position it over the DSC. Insert the assembly into the basket guide sleeve according to the DSC loading plan and repeat until all guide sleeves are filled. After the DSC has been fully loaded, check and record the identity and location of each fuel assembly in the DSC using an underwater TV camera or special optical equipment suitable for this purpose. When the identity of all fuel assemblies in the DSC has been verified, position the shield plug assembly over the DSC, and lower it until it is properly seated.

Engage the lifting yoke to the cask trunnions and verify visually that it is properly positioned and engaged. Raise the transfer cask to the pool surface, stopping vertical movement prior to breaking the surface of the pool. Inspect the top shield plug to verify that it is properly seated on the DSC. If it is not, lower the cask and reposition the shield plug assembly. Raise the cask from the pool while spraying the exposed portion with demineralized water. Drain any excess water from the top of the DSC shield plug assembly back into the pool. Check the radiation levels at the center and perimeter of the top shield plug assembly and around the exposed surface of the cask. Lift the cask from the pool and move it to the cask washdown pit.

5.1.1.3 Cask/DSC Drying Process [See Reference 5.2]

Disengage the rigging cables from the top shield plug and remove the eyebolts. Disengage the lifting yoke from the trunnions and move it clear of the cask. Check the radiation levels along the surface of the cask and decontaminate it as necessary. Place scaffolding around the cask so that any point on its surface is easily accessible to personnel. Decontaminate the top shield plug surface and the exposed DSC shell, and remove the inflatable cask/DSC annulus seal. Connect the cask drain line to the cask, open the cask cavity drain port, and allow water to drain from the annulus until the water level is approximately twelve inches below the top edge of the DSC shell. Take swipes around the outer surface of the DSC shell and check for removable contamination. Dry the top shield plug surface and exposed interior of the DSC shell above the top lead plug. Check radiation levels along the surface of the top shield plug and install temporary shielding as necessary to minimize personnel exposure.

Connect the vacuum drying system (VDS) to the DSC siphon and vent ports, and use the liquid pump to pump approximately 60 gallons of water from the canister to the fuel pool in order to lower the water level in the DSC below the vent port opening. Disconnect the VDS from the DSC, and install a short stub tube to the vent port fitting to ensure that the DSC internal pressure remains atmospheric during the closure weld operation. Install the automatic welding machine and tack weld the top shield plug to the DSC shell. Place the shield plug seal weldment and remove the automatic welding machine.

the compressed helium supply or a compressed air source through the helium inlet connection and

Connect the VDS to the DSC. Open the cask drain port valve and remove the remaining water from the cask/DSC annulus. Remove the remaining water from the DSC cavity by engaging the compressed helium supply and opening the valve to the DSC vent port, forcing the water from the DSC through the siphon port. When water stops flowing from the DSC, close the siphon port valve. Open the valve on the suction side of the vacuum pump, start the pump, and draw a vacuum of 3 torr or less in the DSC cavity. The pressure in the DSC should be reduced in steps to prevent the formation of ice in the DSC cavity or in the VDS. After pumping down to each level, the pump should be valved off and the cavity pressure monitored. The cavity pressure will rise as water and other volatiles in the

VECTRA

July 11, 1994
BGE01-94-1028

Mr. Robert H. Beall
Baltimore Gas & Electric Company
Calvert Cliffs Nuclear Power Plant
Lusby, MD 20657

Subject: Calvert Cliffs NUHOMS® ISFSI Project - Additional Information to Support Use of Air or Helium for Initial Draining of the DSC after Fuel Load

Dear Mr. Beall:

In a telephone conversation between BG&E (Bob Beall) and VECTRA (M. Taylor), BG&E requested the following information regarding the use of air or helium for initial draining of the DSC after fuel load:

1. Are there any restrictions on the quality of the air used for the draining? Is normal plant air acceptable?
2. Is there a time limit on how long the canister internals and fuel can be exposed to the air environment?

VECTRA's responses to the above questions are as follows:

1. Normal plant air is acceptable for the DSC initial draindown.
2. The initial draindown operation is followed immediately by the evacuation and helium backfilling operation. This limits the time that the canister internals and fuel are exposed to an air environment to approximately eight hours. Thermal calculations show that the short term (up to several weeks) fuel cladding temperature limits are not exceeded in a vacuum environment. Since an air environment is less severe than a vacuum environment from a thermal standpoint, short term exposure to air is acceptable from a thermal standpoint. Also, an air environment is no more corrosive to the exposed materials than water in the short term.

VECTRA

If you have any additional questions, please contact me.

Sincerely,

Moses Taylor, Jr.

Moses Taylor, Jr., P.E.
Project Manager

cc: P. A. File
J. B. Makar

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 1

This screening is for: ______10 CFR 50.59 Applicability   _x_ 10 CFR 72.48 Applicability
(Check one regulation only)

______CCNPP   _x_ ISFSI
(Check one facility only)

(Check one activity type only)

______**Procedure:**	Procedure No./Change No.:______
______**Temporary Alteration:**	Temporary Alteration No.:______
______**Setpoint Change:**	SCAF No(s):______
______**Modification:**	MCR/FCR/FEC No.:______ FEC Supplement No.:______
______**Core Reload:**	Unit and Cycle:______
_x_ **UFSAR/USAR:**	UFSAR/USAR Change No.: 94-035
______**Other:**	Identify Activity Type:______

Brief description of the activity:

Change the ISFSI USAR, Vol. I, Sections 1.3.1.7, 1.3.1.9, 4.3.1, and 5.1.1.3 to allow the use of pressurized air or helium for liquid removal from the ISFSI Dry Shielded Canister (DSC) by the Vacuum Drying System (VDS). The current ISFSI USAR describes the VDS operation in four modes: liquid removal by pumping, helium forced liquid removal, vacuum pumping, and helium backfilling. The change only affects the second mode of the VDS operation, where the use of pressurized air or helium is allowed for forced liquid removal from the DSC cavity. The benefits of using air instead of helium is to save a significant amount of helium needed for the blowdown of liquid from the DSC, and to eliminate the presence of helium concentration in the atmosphere of the Spent Fuel Pool area which could interfere with the function of the helium leak detector used for measuring leakage from the DSC inner cover plate closure weld. The presence of helium in the air could result in a delay of the DSC closure operations until the helium concentration is removed by the Auxiliary Building ventilation system.

Technical Specifications/License Conditions (10 CFR 50.59/72.48)

1.____YES _x_ NO Is the proposed activity a change or will it cause a change to the Technical Specifications/License Conditions or Bases?

2.____YES _x_ NO Will the proposed activity cause Structures, Systems or Components (SSCs) to be operated in a manner that violates the Technical Specifications/License Conditions or Bases?

If both answers are **"No,"** continue with the screening. Justification for each **"No"** answer shall be provided. List the sections of the Technical Specifications/License Conditions that were reviewed.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 2

Justification:

The change to the ISFSI USAR description of the VDS operation to allow the use of air or helium in the liquid removal mode does not impact any technical specification. After liquid removal is complete, the DSC cavity will be vacuum dried and backfilled with helium as specified in the ISFSI Technical Specification.

Technical Specifications/License Condition Sections Reviewed:

Reviewed ISFSI Technical Specification, Section 2.2.

If either of the above answers is **"Yes,"** complete a Safety Evaluation and consult CCI-143 for License Amendment Proposals.

CCNPP/ISFSI Facility (10 CFR 50.59/72.48)

1.____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of the structure, system or component (SSC) directly affected by the activity?

If "No," answer each question below:

Why is the SAR description of the function of the SSC not affected?

The DSC provides containment and confinement of the spent fuel during storage. Using pressurized air instead of helium for liquid removal from the DSC cavity during the drying operation does not affect the containment and confinement function of the DSC. The VDS provides a means for removing water and air from the DSC cavity and for backfilling the DSC with helium. The use of air instead of helium in the second stage of the VDS operation to force water out of the DSC cavity has no affect on the function of the VDS. The DSC will still be vacuum dried to remove the air and vapors and then backfilled with helium and sealed as described in the ISFSI USAR.

Why is the SAR description of the method of performing the function of the SSC not affected?

The drying function of the VDS is performed by using pressurized gas to force the liquid out of the DSC cavity. There is no change in the method of performing the drying function of the VDS whether air or helium is pumped into the DSC cavity. Therefore, the use of pressurized air is acceptable and does not affect the method of performing the function of either the VDS or the DSC.

Why is the SAR description of the design of the SSC not changed?

The VDS is designed to remove water and air from the DSC and to backfill the DSC with helium. The VDS is designed to operate in four modes: liquid removal by pumping, forced liquid removal by pressurized gas, vacuum pumping, and helium backfilling. Permitting the use of air instead of helium in the second stage of this operation to force the liquids out of the DSC cavity has no affect on the design of the VDS or the DSC. The atmospheric environment inside the DSC cavity required for the long term dry fuel storage is not affected by this change. The DSC will still be vacuum dried and backfilled with helium, as described in the ISFSI USAR, to provide the required inert environment for long term fuel clad integrity.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 3

2.____YES   __x__NO   Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of any other SSC described in the SAR?

If "No," answer the following question:

Explain why the activity does not affect other SSCs described in the SAR..

No other SSCs are affected by this activity. The final sealed inert environment required for long term storage of the spent fuel inside the DSC cavity is not affected by this change.

3.__x__YES   ______NO   Is the proposed activity a revision to the SAR. (Editorial changes are limited to obvious grammatical/spelling errors, reorganization of portions of the SAR or minor changes that do not affect the intent of the information conveyed by a drawing.)

4.__x__YES   ______NO   Will the proposed activity add to or delete from the SAR description of a SSC?

Procedures (10 CFR 50.59/72.48)

1.____YES   __x__NO   Will the proposed activity affect the intent of any procedure described in the SAR (editorial changes do not need a Safety Evaluation)? The NRC staff does not consider procedures simply listed in the SAR to be described in the SAR. Also, procedures include anything that defines or describes activities or controls over functions, tasks, reviews, tests and safety review meetings.

2._____YES   __x__NO   Will the proposed activity cause SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: The activity allows the use of pressurized air or helium for liquid removal from the DSC cavity during the drying operation of the DSC using the VDS. This change does not affect any procedures outlined in the ISFSI USAR. The VDS four mode operation will not change, nor will the final inert environment inside the DSC. Therefore, the change does not impact the design, function, or method of performing the function of the DSC, or VDS.

Tests or Experiments (10 CFR 50.59/72.48)

1._____YES   __x__NO   Will the proposed activity result in conducting a test or experiment causing SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 4

Justification: This activity is not a test or experiment.

ISFSI (10 CFR 72.48) These questions are only required to be answered for activities affecting ISFSI.

1.____YES __x__NO Will the proposed activity increase any occupational dose for ISFSI related activities?

2.____YES __x__NO Will the proposed activity use additional property for ISFSI operations?

3.____YES __x__NO Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?

Justify each "No" answer below:

Justification: This activity allows the use of air or helium for liquid removal from the DSC cavity during the drying operation. The liquid removal and drying operation using the VDS remains unchanged with no impact to the occupational dose associated with it. The drying activity takes place in the Cask Wash Pit on the 69' level of the Auxiliary Building. No additional ISFSI property nor changes to road transport or equipment is required or included in this activity.

SAR Sections Reviewed:

Volumes I, IV, & V of the ISFSI USAR

If **ALL** answers are "No", A Safety Evaluation is not required.

If **ANY** answer is "Yes", A Safety Evaluation is required.

1.__x__YES _____NO Does this activity require additional screening?

✓ **10CFR 50.59** For Impact on CCNPP
10 CFR 72.48 For Impact on ISFSI

If "Yes", Perform a separate Safety Evaluation Screening.

Prepared By: Sam Shakir *Sam Shakir* Date: *7/8/94*
PRINTED NAME AND SIGNATURE

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 1

This screening is for: __x__10 CFR 50.59 Applicability ____ 10 CFR 72.48 Applicability
(Check one regulation only)

__x__CCNPP ____ISFSI
(Check one facility only)

(Check one activity type only)

______**Procedure:**	Procedure No./Change No.:__________
______**Temporary Alteration:**	Temporary Alteration No.:__________
______**Setpoint Change:**	SCAF No(s):__________
______**Modification:**	MCR/FCR/FEC No.:__________ FEC Supplement No.:__________
______**Core Reload:**	Unit and Cycle:__________
__x__**UFSAR/USAR:**	UFSAR/USAR Change No.:_94-035______
______**Other:**	Identify Activity Type:__________

Brief description of the activity:

Change the ISFSI USAR, Vol. I, Sections 1.3.1.7, 1.3.1.9, 4.3.1, and 5.1.1.3 to allow the use of pressurized air or helium for liquid removal from the ISFSI Dry Shielded Canister (DSC) by the Vacuum Drying System (VDS). The current ISFSI USAR describes the VDS operation in four modes: liquid removal by pumping, helium forced liquid removal, vacuum pumping, and helium backfilling. The change only affects the second mode of the VDS operation, where the use of pressurized air or helium is allowed for forced liquid removal from the DSC cavity. The benefits of using air instead of helium is to save a significant amount of helium needed for the blowdown of liquid from the DSC, and to eliminate the presence of helium concentration in the atmosphere of the Spent Fuel Pool area which could interfere with the function of the helium leak detector used for measuring leakage from the DSC inner cover plate closure weld. The presence of helium in the air could result in a delay of the DSC closure operations until the helium concentration is removed by the Auxiliary Building ventilation system. Only ISFSI SSCs are affected by this change, however, this screen is required since the activity takes place on the 69' level of the Auxiliary Building which is a 10CFR 50.59 territory. No other SSCs inside the Auxiliary Building are affected by this change.

Technical Specifications/License Conditions (10 CFR 50.59/72.48)

1._____YES __x__NO Is the proposed activity a change or will it cause a change to the Technical Specifications/License Conditions or Bases?

2._____YES __x__NO Will the proposed activity cause Structures, Systems or Components (SSCs) to be operated in a manner that violates the Technical Specifications/License Conditions or Bases?

If both answers are **"No,"** continue with the screening. Justification for each **"No"** answer shall be provided. List the sections of the Technical Specifications/License Conditions that were reviewed.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 2

Justification:

A description of the VDS drying operation appears only in the ISFSI USAR and the ISFSI Technical Specifications. No such description appears in the UFSAR or the Plant Technical Specifications.

Technical Specifications/License Condition Sections Reviewed:

Reviewed all sections of the CCNPP Technical Specifications. None are applicable to this activity.

If either of the above answers is **"Yes,"** complete a Safety Evaluation and consult CCI-143 for License Amendment Proposals.

CCNPP/ISFSI Facility (10 CFR 50.59/72.48)

1.____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of the structure, system or component (SSC) directly affected by the activity?

If "No," answer each question below:

Why is the SAR description of the function of the SSC not affected?

The activity has no impact on the function of the DSC and VDS as described in the ISFSI USAR. No SSCs described in the UFSAR are affected by the liquid removal operation from the DSC. The liquids and gases removed from the DSC will still be routed to the Auxiliary Building Processing System or the Spent Fuel Pool as described in the ISFSI USAR. Therefore, this activity does not affect the function of any SSCs in the Auxiliary Building.

Why is the SAR description of the method of performing the function of the SSC not affected?

The drying operation of the DSC, which takes place in the Auxiliary Building, will remain unchanged by the use of pressurized air instead of helium for liquid removal from the DSC cavity. No SSCs described in the UFSAR are affected by this change.

Why is the SAR description of the design of the SSC not changed?

No SSCs described in the UFSAR are affected by this change.

2.____YES __x__NO Will the proposed activity result in a change to the SAR description of the design, function or method of performing the function of any other SSC described in the SAR?

If "No," answer the following question:

Explain why the activity does not affect other SSCs described in the SAR..

This is an ISFSI activity involving ISFSI components only that takes place inside the Auxiliary Building. No other SSCs described in the UFSAR are affected by this change.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 3

3.____YES ___x___NO Is the proposed activity a revision to the SAR. (Editorial changes are limited to obvious grammatical/spelling errors, reorganization of portions of the SAR or minor changes that do not affect the intent of the information conveyed by a drawing.)

4.____YES ___x___NO Will the proposed activity add to or delete from the SAR description of a SSC?

Procedures (10 CFR 50.59/72.48)

1.____YES ___x___NO Will the proposed activity affect the intent of any procedure described in the SAR (editorial changes do not need a Safety Evaluation)? The NRC staff does not consider procedures simply listed in the SAR to be described in the SAR. Also, procedures include anything that defines or describes activities or controls over functions, tasks, reviews, tests and safety review meetings.

2.____YES ___x___NO Will the proposed activity cause SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: The activity allows the use of pressurized air in place of helium for liquid removal from the DSC cavity during the drying operation of the DSC. This is an ISFSI activity that takes place inside the Auxiliary building. This change does not affect any procedures outlined in the UFSAR, nor does it impact the design, function, or method of performing the function of any SSCs described in the UFSAR.

Tests or Experiments (10 CFR 50.59/72.48)

1.____YES ___x___NO Will the proposed activity result in conducting a test or experiment causing SSCs to be operated in a manner that is not consistent with the design, function, or method of performing the function, as described in the SAR?

Justify each "No" answer below:

Justification: This activity is not a test or experiment.

ISFSI (10 CFR 72.48) These questions are only required to be answered for activities affecting ISFSI.

1.____YES ______NO Will the proposed activity increase any occupational dose for ISFSI related activities?

2.____YES ______NO Will the proposed activity use additional property for ISFSI operations?

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM
Page 4

3._____YES ______NO Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?

Justify each "No" answer below:

Justification:

SAR Sections Reviewed:

Volumes I, IV, & V of the ISFSI USAR

If **ALL** answers are "No", A Safety Evaluation is not required.

If **ANY** answer is "Yes", A Safety Evaluation is required.

1.___x___YES ______NO Does this activity require additional screening?

10CFR 50.59 For Impact on CCNPP
✓ **10 CFR 72.48** For Impact on ISFSI

If "Yes", Perform a separate Safety Evaluation Screening.

Prepared By: Sam Shakir Sam Shakir Date: 7/8/99
PRINTED NAME AND SIGNATURE

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 1)

ACTIVITY: MCR 93-031-003-01   50.59 Log No.: N/A   72.48 Log No.: 94-B-0312-005-R00

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

___YES X__NO   Involve an unreviewed safety question (USQ)?

___YES X__NO   Involve a change in the Technical Specifications/License Conditions or Bases?

X__YES ___NO   Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

___YES X__NO   Involve a Significant Increase in Occupational Dose?

___YES X__NO   Involve a Significant Unreviewed Environmental Impact?

Prepared by: Kirk A. Kondos [signature] Department: PDSU Date: 11/30/94

PRINTED NAME AND SIGNATURE

___YES X__NO   Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.:__________	Resp. Ind.:__________	Resp. Ind.:__________
PRINTED NAME	PRINTED NAME	PRINTED NAME
SIGNATURE	SIGNATURE	SIGNATURE
Work Group:__________	Work Group:__________	Work Group:__________
Date:__________	Date:__________	Date:__________

Approved X   Disapproved _

Signature [signature]

INDEPENDENT REVIEWER

Date: 12/7/94

Approved X   Disapproved __

Signature [signature]

GS-DES,GS-TSES, OR PE-PDSU

Date: 12/7/94

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 2)

ACTIVITY: MCR 93-031-003-01 50.59 Log No.: N/A 72.48 Log No.: 94-B-0312-005-R00

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 94-168 Date: 12/14/94

Recommend Approval ✓ Recommend Disapproval ____ Signature [signature] Date 12-14-94

POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature [signature] FOR CHC Date 12/14/94

PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

OSSRC Meeting No.: 96-005 Date: 5/16/96

Recommend Approval ____ Recommend Disapproval ____ Signature ____________________ Date ________

OSSRC CHAIRMAN

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 3)

ACTIVITY: MCR 93-031-003-01 50.59 Log No.: N/A 72.48 Log No.: 94-B-0312-005-R00

Proposed Activity:

The proposed activity retires the backup meteorological instruments located on the microwave tower as described in USAR Section 2.3.3, On-Site Meteorological Measurement Program, Figure 2.3-2 (Meteorological Instrument Elevations), Figure 2.3-3 (Meteorological Data Acquisition System) and Table 2.3-2 (On-Site Meteorological Stations and Instrumentation). This USAR Section will be revised by this proposed activity by removing all references to the backup meteorological instruments located on the microwave tower or stating they are spare.

Reason of Activity:

The backup meteorological instruments located on the microwave tower are old and use obsolete equipment. This equipment requires a significant amount of maintenance to remain operational. The backup meteorological system is of such design that it creates a detrimental maintenance environment for technicians replacing and repairing equipment.

Function(s) of affected SSC:

The function of the backup meteorological instruments located on the microwave tower was to provide meteorological information to the control room for determining the magnitude of and for continuously assessing the impact of the release of radioactive materials to the environment. Information is displayed to the control room on the plant computer and the technical support center (MIDAS) computer. This function of the backup meteorological instruments located on the microwave tower will be eliminated by this activity.

The plant computer function is to assist the control room operators in the safe and efficient operation of each unit. This activity simply removes inputs from the backup meteorological instruments located on the microwave tower and the switchyard building to the plant computer. The inputs from the backup meteorological instruments located on the microwave tower and the switchyard building are not used by the control room operators in the safe and efficient operation of each unit.

The function of the Technical Support Center Computer is to provide selected plant status information to support staff assigned to the TSC during designed times. This information is available on display monitors (MIDAS), printers and trend recorders. The TSC computer enables the support staff to monitor and assess the status of the plant and assist the control room operators in analyzing events and safely stabilizing the plant. The inputs from the backup meteorological instruments located on the microwave tower and the switchyard building to the TSC have been duplicated by inputs from the meteorological tower.

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 4)

ACTIVITY: MCR 93-031-003-01 50.59 Log No.: N/A 72.48 Log No.: 94-B-0312-005-R00

SAR Sections Reviewed:

USAR Section 2.3.3, On-Site Meteorological Measurement Program, Figure 2.3-2 (Meteorological Instrument Elevations), Figure 2.3-3 (Meteorological Data Acquisition System) and Table 2.3-2 (On-Site Meteorological Stations and Instrumentation) was reviewed. This USAR Section will be revised by this proposed activity by removing all references to the backup meteorological instruments located on the microwave tower or stating they are spare.

Technical Specification 3/4.3.3 provides requirements for Technical Specification-related meteorological instrumentation. Table 3.3-8 lists the required meteorological monitoring instrumentation channels. All of the instrumentation listed on this table is mounted on the primary tower. None of the instrumentation on the backup meteorological tower is required by the Technical Specifications.

NUREG-0654 requires each site to have a viable backup meteorological system to provide meteorological information when the primary system is out of service. The acceptance criteria for the backup meteorological system are described in the proposed Revision 1 to Regulatory Guide 1.23. Regulator Position C.8 of Regulatory Guide 1.23, Revision 1 recommends that an independent system or procedure be established for obtaining measurements of wind direction and speed representative of the 10-meter level and an estimate of the atmospheric stability (e.g., temperature difference with height, wind direction fluctuations). It is important to note that the backup tower is described in Regulatory Position (8) ONLY, and is not required to meet the other seven criteria in the Regulatory Position section of this Regulatory Guide. Additionally, the backup meteorological instruments on the microwave tower satisfy the requirements of Regulatory Guide 1.23, Revision 1, for an independent system, as described in letter from Mr. A. E. Lundvall, Jr. (BG&E) to MR. T. T. Martin (NRC), dated February 8, 1985, "Radiological Dose Assessment Capability During Emergencies".

In addition to the regulatory guidance described above, Regulatory Guide 1.97, Revision 3 specifies additional requirements for meteorological instrumentation. Meteorological assessment is considered a Category 3 variable. However, redundancy is not required for Category 3 instrumentation; therefore, the backup meteorological tower is not required to meet the requirements of this Regulatory Guide. Letter from J. A. Tiernan (BG&E) to NRC Document Control Desk, dated August 9, 1988, "Regulatory Guide 1.97 Review and Update" describes how Calvert Cliffs' primary meteorological tower meets the requirements of Regulatory Guide 1.97.

Calvert Cliffs had implemented both an independent procedure and system using the back up tower for obtaining meteorological information. ERPIP 825, Revision 0 provided instructions for obtaining wind speed and direction data from Patuxent River Naval Air Station, and for determining atmospheric stability from outside observation, if both the primary and backup meteorological instrumentation is nonfunctional. A 10 CFR 50.54(q) (POSRC approved on November 1, 1993) has revised ERPIP to Revision 1 which no longer references the backup meteorological instrumentation. This 10 CFR 50.54(q) has also revised ERP Revision 17, Section 5.III.A., Geophysical Phenomena Monitors, deleted the reference to a backup tower in lieu of reference to the Emergency Response Plan Implementation Procedures which provides a backup method for obtaining meteorological data.

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 5)

ACTIVITY: MCR 93-031-003-01 50.59 Log No.: N/A 72.48 Log No.: 94-B-0312-005-R00

Complete for 50.59 and 72.48:

1. **The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.**

___ Yes X__ No May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The postulated malfunction is a malfunction of the backup meteorological system.

The wording of NUREG 0654 and Reg. Guide 1.23 allows independent systems OR procedures to be established as backup methods (for obtaining measurements of wind direction, wind speed and an estimate of atmospheric stability). Calvert Cliffs Emergency Response Plan Implementation Procedures have established a backup method for obtaining wind speed and direction from Patuxent River Naval Air Station. Backup atmospheric stability estimates are derived from sigma theta instruments (on the primary meteorological tower), and a method for determining atmospheric stability from outside observation if measurements are unavailable. These procedures meet the requirements of NUREG 0654 and Reg. Guide 1.23. Since these independent methods are adequate to provide required backup, deletion of the backup meteorological instruments located on the microwave tower does not increase the probability of malfunction of equipment important to safety as previously evaluated in the SAR.

___ Yes X__ No May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The radiological consequences have not increased. This activity removes data inputs from the backup meteorological instruments located on the microwave tower to the Technical Support Center Computer and the plant computer via the DAS. The meteorological tower currently is a data input to the Technical Support Center Computer. The removal of the data inputs from the backup meteorological instruments will not change the anticipated plant response to any malfunction. Therefore, the consequences of a malfunction of equipment important to safety are not increased.

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 6)

ACTIVITY: MCR 93-031-003-01 50.59 Log No.: N/A 72.48 Log No.: 94-B-0312-005-R00

___ Yes X__ No May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

None of the equipment associated with the backup meteorological instruments located on the microwave tower represents an accident initiator, therefore there is no increase in the probability of an accident.

___ Yes X__ No May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The function of the Technical Support Center Computer and the plant computer is unaffected by the removal of the data inputs from the backup meteorological instruments located on the microwave tower. The backup meteorological instruments located on the microwave tower are not credited and play no role in the accident mitigation. Revision 1 to the ERPIP no longer references the backup meteorological instrumentation. ERP Revision 17, Section 5.III.A., Geophysical Phenomena Monitors, deleted the reference to a backup tower. Therefore, any assumptions made in evaluating the radiological off-site dose to the public are not altered. Therefore, the consequences of any accident previously evaluated in the SAR are not increased.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

___ Yes X__ No May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

As stated in paragraph i.A, the Calvert Cliffs Emergency Response Plan Implementation Procedures have established a backup method for obtaining wind speed, wind direction and atmospheric stability. These procedures meet the requirements of NUREG 0654 and Reg. Guide 1.23. Since these independent methods are adequate to provide required backup, deletion of the backup meteorological instruments located on the microwave tower does not create the possibility of a malfunction of equipment important to safety of a different type than any evaluated previously in the SAR.

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 7)

ACTIVITY: MCR 93-031-003-01 50.59 Log No.: N/A 72.48 Log No.: 94-B-0312-005-R00

___ Yes X__ No May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

This activity does not create or increase the possibility of an accident. The backup meteorological instruments located on the microwave tower are passive devices that only provide control room indication. Therefore, this activity does not create or increase the possibility of an accident during any mode.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any Technical Specification is not reduced.

___ Yes X__ No Will the margin of safety as defined in the basis for any Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
3/4.3.3	Technical Specification 3/4.3.3 provides requirements for Technical Specification-related meteorological instrumentation. Table 3.3-8 lists the required meteorological monitoring instrumentation channels. All of the instrumentation listed on this table is mounted on the primary tower. None of the instrumentation on the backup meteorological tower is required by the Technical Specifications.

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 8)

ACTIVITY: MCR 93-031-003-01 50.59 Log No.: N/A 72.48 Log No.: 94-B-0312-005-R00

Complete for 72.48:

___ Yes X__ No Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

This activity does not have any affect on Occupational Dose. The backup meteorological instruments located on the microwave tower are a passive device that only provides control room indication.

___ Yes X__ No Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

This activity does not affect any area of the plant site previously undisturbed for the ISFSI installation. This activity does not revise the ISFSI Environmental Impact Statement. The backup meteorological instruments are located on the microwave tower in the switchyard.

Summary: (For NRC Report, provide a brief overview)

The proposed activity retires the backup meteorological instruments located on the microwave tower as described in USAR Section 2.3.3, On-Site Meteorological Measurement Program, Figure 2.3-2 (Meteorological Instrument Elevations), Figure 2.3-3 (Meteorological Data Acquisition System) and Table 2.3-2 (On-Site Meteorological Stations and Instrumentation). This USAR Section will be revised by this proposed activity by removing all references to the backup meteorological instruments located on the microwave tower or stating they are spare.

This activity does not constitute an Unreviewed Safety Question (USQ). This activity has no affect in the occupational dose and does not involve a significant unreviewed environmental impact for the ISFSI installation.

Calvert Cliffs Emergency Response Plan Implementation Procedures have established a backup method for obtaining wind speed and direction from Patuxent River Naval Air Station. Backup atmospheric stability estimates are derived from sigma theta instruments (on the primary meteorological tower), and a method for determining atmospheric stability from outside observation if measurements are unavailable. These procedures meet the requirements of NUREG 0654 and Reg. Guide 1.23. Since these independent methods are adequate to provide required backup, deletion of the backup meteorological instruments located on the microwave tower from the Emergency Response Plan does not reduce the plan's effectiveness.

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 1 of 4)

Page 1 of 4

ACTIVITY: ISFSI USAR CHANGE 50.59 Log No.: NA 72.48 Log No.: 95-0001
SE 00001

Based on the attached discussion, does this activity:
Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

__ YES X NO Involve an unreviewed safety question (USQ)?
__ YES X NO Involve a change in the Technical Specifications/License Conditions or Bases?
X YES __ NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

__ YES X NO Involve a Significant Increase in Occupational Dose?
__ YES X NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: M.A. CARR Department: NED/DES/CEU Date: 6/30/95
PRINTED NAME AND SIGNATURE
Jon N. Woodfield Jon N. Woodfield 7/5/95

X YES __ NO Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: S. MIDGETT (PRINTED NAME)	Resp. Ind.: R.H. Beall (PRINTED NAME)	Resp. Ind.: G. Tesfaye (PRINTED NAME)
SIGNATURE	SIGNATURE	SIGNATURE
Work Group: PES	Work Group: NFM	Work Group: LICENSING
Date: 7/6/95	Date: 7/10/95	Date: 7-5-95

Approved ✓ Disapproved __	Approved ✓ Disapproved __
Signature G.V. PATEL INDEPENDENT REVIEWER 7-15-95	Signature Michael J Galvan for GS-DES, GS-TSES, or PE-PDSU
Date 7-15-1995	Date 8.17.95

The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 95-97 Date: 8-23-95

Recommend Approval ✓ Recommend Disapproval _____ Signature _____ Date 8-23-95
POSRC CHAIRMAN

Approved ✓ Disapproved _____ Signature _____ Date 8/24/95
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.
OSSRC Meeting No.: 95-001 Date: 11-22-95

Recommend Approval _______ Recommend Disapproval _____ Signature _____ Date _____
OSSRC CHAIRMAN

ATTACHMENT 3, SAFETY EVALUATION FORM

SE 00001

ACTIVITY: Calvert Cliffs ISFSI USAR Change **50.59 Log No:** NA **72.48 Log No:** 95-0001

Proposed Activity: *Upgrade the site's vehicle barrier systems to prevent access by a malevolent vehicle within the Safe Standoff Distance from selected CCNPP SSCs. Pertinent to this evaluation, this activity will include installation of a power-operated gate across the ISFSI haul road adjacent to the NSF Sallyport. This activity results in changing the* *ISFSI USAR* *as follows (with deletions lined through and additions underlined):*

1) Change USAR Volume I, Section 10.3.4.1, Item B. Specifications, first paragraph (as revised by 72.48 #94-0-101-003, which is scheduled to be included in the 1995 USAR revision) to read:

"The roadway or ground surface elevation perpendicular to the route to or from the ISFSI within an 8.0 ft proximity of the transfer trailer shall not be more than 20 inches below the trailer road surface centerline elevation. The paved portion of the road shall be a minimum of 16 feet wide and the adjacent paved, gravel or soil shoulder shall extend to make the transfer route at least 28 feet wide. The lowest point within the 28 foot wide transfer route shall not be lower than 20 inches below the road centerline and may contain typical roadside features, including curbs, fences, guard rails and light poles which do not constitute potential puncture mechanisms for the cask. The shoulders may not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture mechanism. The components associated with the vehicle barrier system, installed adjacent to the Nuclear Security Facility and closing the 16 foot wide ISFSI haul road at the Protected Area boundary, have been analyzed and do not represent a puncture risk to the transfer cask. The road shall be closed to other vehicles when transporting spent fuel."

Reason for the Activity:
The current ISFSI USAR describes the transfer route and restricts items which could present a risk of transfer cask (TC) and Dry Shielded Canister (DSC) puncture from placement within the 28 foot wide transfer route. Without clarification, this restriction could be interpreted to include vehicle barrier components, such as barrier support buttresses, and could lead to unnecessary concern or confusion about site compliance with the ISFSI USAR. The installation of vehicle barriers across the ISFSI haul road is necessary to meet the requirements of 10CFR73.55. The proposed vehicle barrier buttresses have been shown by calculation 95-0185 to be enveloped by the existing cask drop analysis. In addition, the consequences of an uncontrolled drop of the vehicle barrier's crash beam has been shown by the same calculation to be enveloped by the existing cask drop analysis.

Function(s) of Affected SSCs:
The ISFSI haul road provides a hard paved surface for the tractor to transport spent fuel in a NUHOMS-24P DSC/TC from the Auxiliary Building to the ISFSI.

SAR Sections Reviewed:
ISFSI Vol. I, All Sections;
ISFSI Vol. IV, Section 2, SAR Q&A December 20, 1990;
ISFSI Vol. IV, Section 4, NRC ISFSI SER November 1992;
ISFSI Vol. V, All Sections.

ATTACHMENT 3, SAFETY EVALUATION FORM
(Page 3 of 4)

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

___Yes _√_ No May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

The equipment important to safety is the spent fuel haul rig (TC/DSC mounted on the transfer trailer/support cradle and pulled by the tractor). The malfunction of this equipment involves the sequence of events which could lead to a cask drop. The scenario is comprised of: (1) the haul rig veers off course; (2) the transfer trailer strikes a roadside object and is damaged; (3) the damage causes the transfer trailer to tip far enough to drop the TC/DSC; and, (4) the TC/DSC hits something. The malfunction of concern is the loss of directional control of the transfer rig. Items 2, 3, and 4 are subsequent steps with a cause-and-effect relationship leading to the consequence of concern, TC puncture, which is addressed in the consequences section, below. The transport vehicle is administratively controlled to stay in the center of the transfer route and at very low speed. In addition, the paved road is at least 16' wide and provides several feet of margin in the event of a loss of vehicle control. The vehicle barrier buttresses are 24' apart and do not encroach upon the 16' transfer road (do not reduce the margin for correcting vehicle misdirection). The probability of loss of vehicle control is independent of the presence of the proposed vehicle barrier across the haul road. The administrative controls in place are sufficient to ensure the vehicle does not veer off course. Hence, the probability of occurrence of a malfunction of equipment important to safety previously evaluated is not increased.

___Yes _√_ No May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

The consequences of an accident or malfunction in the TC/DSC are associated with a cask drop leading to puncture of the TC/DSC and release of the enclosed fission products to the atmosphere. Calculation C-95-0185 demonstrates that a cask drop onto the vehicle barrier buttresses does not lead to a cask puncture. Hence, the consequences of a malfunction are not increased.

__ Yes _√_ No May the probability of occurrence of an accident previously evaluated in the SAR be increased?

The applicable accident previously evaluated is the drop of the TC/DSC for heights up to 80 inches above a thick hard surface. The probability of a cask drop accident is not increased because the physical dimensions and operation of the spent fuel haul rig (TC/DSC mounted on the transfer trailer/support cradle and pulled by the tractor) do not change.

__ Yes _√_ No May the consequences of an accident previously evaluated in the SAR be increased?

The consequences of a TC/DSC drop deal with dose from release of fission products via a puncture of the TC/DSC. BGE Calculation 95-0185 provides the parameters between which the TC/DSC integrity during a cask drop accident onto the vehicle barrier is assured. The required buttress dimensions have been incorporated into the modification Design Instructions. Fuel moves will be restricted if the above-ground portions of the barrier buttresses are in an intermediate stage of completion. This restriction is stated in the Design Instructions. Excavation restrictions have also been incorporated into the modification Design Instructions to ensure the 80 inch height restriction is not exceeded should fuel moves occur during the mod implementation period. Since the physical dimensions and operation of the TC/DSC and trailer/support system do not change due to the presence of the proposed vehicle barrier and because of the prescribed dimensions of the barrier buttresses, puncture of the TC/DSC will not occur and the consequences of a cask drop are not increased.

ATTACHMENT 3, SAFETY EVALUATION FORM
(Page 4 of 4)

2. The possibility for an accident or malfunction of a different type than evaluated previously in the SAR is not created.

__ Yes _√_ No May the possibility of a malfunction of a different type than previously evaluated in the SAR be created?

Any malfunction of the TC/DSC would be associated with a drop height greater than 80 inches. Since the physical dimensions and operation of the TC/DSC and trailer/support system prevent a fall of over 80 inches, which is currently acceptable and does not change, the possibility of a new malfunction is not increased.

__Yes _√_ No May the possibility of an accident of a different type than previously evaluated in the SAR be created?

The proposed changes affect transportation of spent fuel inside the TC/DSC. The configuration of the proposed gate is a semaphore-style gate with a reinforced steel crash beam and counterweight. The effects of the gate dropping on the TC have been shown to be within the existing cask drop analysis (BGE Calc 95-0185). Since the bounding case envelopes the proposed activities, no possibility of a new accident is created.

3. The margin of safety as defined in the basis for any Technical Specification is not reduced.

__Yes _√_ No Will the margin of safety as defined in the basis for any Technical Specification be reduced?

Tech Spec Basis 2.3 states that the TC drops less than 80 inches will not produce unacceptable damage to the TC/DSC. Analysis of the proposed barrier buttresses (for a cask drop) and crash beam (for a barrier crash beam drop onto the TC) show that the effects on the TC and DSC are within the envelope of the current design bases (BGE Calc 95-0185).

<u>Complete for a 72.48</u>:

__Yes _√_ No Will the proposed activity involve a significant increase in occupational dose?

The opening time for the proposed gate is less than 30 seconds and may be performed in a manner which will not delay spent fuel transport operations. Therefore, there will be no significant increase in occupational dose associated with the addition of this vehicle barrier.

__Yes _√_ No Will the proposed activity involve a significant unreviewed environmental impact?

Since the transfer route does not change, adding the proposed vehicle barrier does not affect the environmental conditions of the ISFSI.

<u>Summary</u>: (For NRC Report, provide a brief overview)

The Independent Spent Fuel Storage Installation (ISFSI) haul road provides a hard paved surface for the tractor to transport spent fuel in a NUHOMS-24P DSC/TC from the CCNPP Auxiliary Building to the ISFSI. The ISFSI USAR description of the transfer route was changed to allow the presence of a vehicle barrier to be installed to comply with 10CFR73.55, as amended in August, 1994. The change allows the vehicle barrier's supporting buttresses to be installed within the 28 foot wide transfer route. It has been confirmed by calculation that a cask drop onto the vehicle barrier buttresses and a crash beam drop onto the TC are enveloped by the existing cask drop analysis. This change does not constitute an unreviewed safety question, a change to the Technical Specifications or Bases, a significant increase in occupational exposure nor an unreviewed environmental impact for the ISFSI.

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR) (Page 1 of 2)

NONMOD # 95-028

UCR # ______ For LU use only

To: UFSAR Coordinator

From: MATTHEW A. CARR (Printed Name) Work Group CEU Date 6/1/95

Phone Number: 260-6848 System Number 107

SECTION 1 (Change Initiation)

A. UFSAR CHANGE SOURCE DOCUMENT

FCR/FEC/MCR# 95-0201 (Circle One) Procedure # ES1995 01089-000

License Amendment # ______

Regulatory Generic Correspondence # ______
Generic Letter, Bulletin or Information Notice

Unit 1 ____ Unit 2 ____ Common ____ ISFSI X

***B. SAFETY EVALUATION** [Check One]*

___Safety Evaluation Screening Not Required per Attachment 5 Criteria:______
BASIS FOR TYPE 1 UFSAR CHANGE CLASSIFICATION
(Attach additional pages, if required)

Is the proposed UFSAR change consistent with the Technical Specifications/License Conditions or Bases? _____ Yes _____No
(If the above question is answered "No", consult CCI-143 for License Amendment Proposals.)

___Safety Evaluation Screening attached SE00001

X Safety Evaluation Log# (attached) 95-0001 (72.48)

___NRC Safety Evaluation Report (SER) attached, dated ______

C. DESCRIPTION OF UFSAR CHANGE: INSERT A STATEMENT SPECIFICALLY RECOGNIZING THAT THE VEHICLE BARRIER TO BE INSTALLED ACROSS THE ISFSI HAUL ROAD DOES NOT REPRESENT A PUNCTURE THREAT TO THE TRANSFER CASK IN THE UNLIKELY EVENT OF A CASK DROP ACCIDENT DURING FUEL TRANSFER OPERATIONS

D. UFSAR SECTIONS AFFECTED: **[Attach Marked up Page(s)]**

VOL I, SECTION 10.3.4.1, ITEM B. SPECIFICATIONS. (AND Q+A SECTION)

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR) (Page 2 of 2)

Source Document #: 95-028

UCR#:

For LU use only

SECTION 2 *(Interdisciplinary Reviews)*

VERIFICATION THAT THE TECHNICAL CONTENT OF THIS UFSAR CHANGE AGREES WITH THE FACILITY DESIGN AND CONFIGURATION

RESP. IND. G. Tesfaye [signature] WORK GROUP: Licensing 7/5/95
Printed Name and Signature

RESP. IND. [signature] WORK GROUP: PSEU 7/6/95
Printed Name and Signature

RESP. IND. R.H. Beall / [signature] WORK GROUP: NFM 7/10/95
Printed Name and Signature

SECTION 3 *(Implementation Verification Prior to UFSAR Incorporation)*

VERIFICATION THAT NOTIFICATION HAS BEEN RECEIVED INDICATING THAT PLANT MODIFICATION INCORPORATED:

☐ Partial Implementation ☐ Unit 1 ☐ Unit 2

This change will be incorporated in Revision No. ________

UFSAR COORDINATOR: ________ DATE: ________

SECTION 4 *(Final Review/Approval Prior to UFSAR Incorporation)*

MODIFICATIONS - VERIFICATION THAT THE UFSAR CHANGE IS IN AGREEMENT WITH CURRENT DESIGN INFORMATION

NONMODS - VERIFICATION OF CONCURRENCE WITH THE BASIS FOR CLASSIFYING THE CHANGE AS A TYPE 1 UFSAR CHANGE AND THE DETERMINATION OF CONSISTENCY WITH THE TECHNICAL SPECIFICATIONS (IF APPLICABLE), AND THAT THE TECHNICAL CONTENT OF THIS UFSAR CHANGE AGREES WITH THE FACILITY DESIGN AND CONFIGURATION.

RESPONSIBLE ENGINEER: [signature] M. A. CARR DATE: 8/10/95
K.C. [signature] 8/10/95

RESP. ENGR'S. SUPERVISOR: [signature] DATE: 8.17.95

SECTION 5 *(Implementation Review)*

VERIFICATION THAT THE DOCUMENTATION REQUIRED BY CCI-177 IS INCLUDED IN THE UFSAR LICENSING PACKAGE AND THAT THE UFSAR CHANGE HAS BEEN ACCURATELY INCORPORATED.

UFSAR COORDINATOR: ________ DATE: ________

10.3.4 LIMITING AND OPERATING CONDITIONS FOR TRANSFER CASK CONTAINING LOADED DSC

10.3.4.1 Transfer Route Selection [See Reference 10.2]

A. Title: Transfer Route Selection

B. Specifications: The roadway or ground surface elevation perpendicular to the route to or from the ISFSI within an 8.0 ft proximity of the transfer trailer shall not be less than that of the trailer road surface elevation as measured at the outer edge of asphalt pavement. The paved portion of the road shall be a minimum of 16 feet wide and the adjacent paved, gravel or soil shoulder shall be a minimum of 7 feet wide on each side of the road. The shoulder shall be level with or higher than the outer edge of the pavement and may contain typical roadside fixtures, including curbs, fences, guard rails and light poles which do not constitute potential puncture devices for the cask. The shoulders may not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture device. The road shall be closed to other vehicles when transporting the spent fuel.

SEE NOTE

The maximum drop height of the cask from the transfer trailer to the roadbed does not exceed 80 inches.

C. Applicability: This specification is applicable to DSC transfer utilizing the NUHOMS-24P transfer cask and trailer.

D. Objective: Ensure that a potential drop height of 80 inches is not exceeded.

E. Action: Repair the road to its proper elevation.

F. Surveillance: Prior to the transfer of a DSC to or from an HSM, the proposed transfer route shall be visually inspected.

G. Bases: A drop from a height of 80 inches or less does not compromise the design margins of the transfer cask or DSC.

NOTE - THE SUBJECT PARAGRAPH WAS REVISED, BUT NOT YET INCORPORATED INTO THE USAR. THE REVISING 72.48 PAGES ARE ATTACHED (72.48 # 94-0-101-003).

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No.____ or 72.48 Log No. 94-0-101-003

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

___YES _X_ NO Involve an Unreviewed Safety Question (USQ)?
___YES _X_ NO Involve a change to the Technical Specifications/License Conditions or Bases?
_X_YES ___ NO Require a change or addition to the UFSAR or USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

___YES _X_ NO Involve a Significant Increase in Occupational Dose?
___YES _X_ NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: Sam Shakir SAM SHAKIR (PRINTED NAME AND SIGNATURE (VECTRA)) Department: CCSO Date: 8/2/94

_X_YES ___NO Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: J.B. MAKAR (PRINTED NAME) K4042	Resp. Ind.: G. Tesfaye (PRINTED NAME)	Resp. Ind.: ______ (PRINTED NAME)
[signature] (SIGNATURE)	[signature] (SIGNATURE)	______ (SIGNATURE)
Work Group: System Engineer	Work Group: Licensing Unit	Work Group: ______
Date: 8-5-94	Date: 9-20-94	Date: ______

Approved ✓ Disapproved ___	Approved ✓ Disapproved ___
Signature Sam Shakir for Moses Taylor Per Tele. Con. (INDEPENDENT REVIEWER (VECTRA))	Signature Michael J. Gahan III (GS-DES, GS-TSES, or PE-PDSU) M. J. GAHAN III 9.20.94; J. K. Epley CCSO 8/10/94
Date: 8/4/94	Date: ______

The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 94-145 Date: 9-28-94

Recommend Approval ✓ Recommend Disapproval ___ Signature [signature] (POSRC CHAIRMAN) Date: 9-28-94

Approved ✓ Disapproved ___ Signature [signature] (PLANT GENERAL MANAGER) Date: 9/28/94

The OSSRC has reviewed this evaluation according to NS-2-100.
OSSRC Meeting No.: ______ Date: ______

Recommend Approval ___ Recommend Disapproval ___ Signature ______ (OSSRC CHAIRMAN) Date: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: **Calvert Cliffs ISFSI USAR Change** **50.59 Log No.____ or 72.48 Log No. 94-0-101-003**

Proposed Activity:
This activity changes the requirements for the ISFSI transfer route to allow the shoulders to be up to 20" lower than the centerline elevation of the road surface. This activity results in changing the ISFSI USAR as follows:

1) Change USAR Volume IV, Section 2 USAR Q&A, Question 8.0-5 Response, first paragraph to read:

"The transfer cask will be transported along an asphalt or concrete paved road which is at least 16 feet wide and which has shoulders which extend to make the transfer route at least 28 feet wide. The road is approximately 3,300 linear feet with grades which range from 0% to 3% except for an approximate 50 foot length which carries a 5.7% grade. The roadbed is level except for a negligible 1% slope required to create a crown in the road for drainage and a transverse slope at any point along the transportation route of less than 10%. The shoulders are either level with the road, or slope down from the road such that the maximum vertical distance from the centerline of the road to the lowest point within the 28 foot wide transfer route is 20 inches. In those locations where the paved road abuts up to existing blacktop, or concrete paving, the shoulder is discontinued. The shoulder may be paved, gravel or soil and contain typical roadside fixtures, including curbs, fences, guard rails and light poles which do not constitute potential puncture mechanisms for the cask during a drop. The shoulders do not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture mechanism during a cask drop. For the entire route that the transfer cask is transported there will exist a minimum 8 foot wide zone on each side of the trailer that is not more than 20 inches below the road centerline elevation."

2) Change USAR Volume I, Section 10.3.4.1, Item B. Specifications, first paragraph to read:

"The roadway or ground surface elevation perpendicular to the route to or from the ISFSI within an 8.0 ft proximity of the transfer trailer shall not be more than 20 inches below the trailer road surface centerline elevation. The paved portion of the road shall be a minimum of 16 feet wide and the adjacent paved, gravel or soil shoulder shall extend to make the transfer route at least 28 feet wide. The lowest point within the 28 foot wide transfer route shall not be lower than 20 inches below the road centerline and may contain typical roadside fixtures, including curbs, fences, guard rails and light poles which do not constitute potential puncture mechanisms for the cask. The shoulders may not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture mechanism. The road shall be closed to other vehicles when transporting the spent fuel."

Reason for Activity:
The current ISFSI USAR description of the transfer route and shoulders is unnecessarily restrictive regarding the allowable elevation of the shoulder surface relative to the transfer road surface and the relative width of the paved road and the adjacent shoulders. The current description of the road specifies the elevation of the shoulder surface to be not less than that of the trailer road surface centerline elevation. This description is restrictive considering that the shoulders are affected by heavy rain and at times get eroded and washed away requiring constant repair. The significance of the shoulder elevation is to limit the drop height of the cask to its designed limit of 80 inches. Since the maximum distance from the bottom of the transfer cask to the road centerline is 56.25 inches, this allows the lowest point on the transfer route to be up to 20 inches below the elevation of the road centerline without affecting the design basis of 80 inches. The current description of the shoulders width is also restrictive. The ISFSI USAR describes the shoulders as being a minimum of 7 feet wide on each side of the road. This will now be changed to specify a total width of the transfer route including shoulders at a minimum of 28 feet.

Function (s) of affected SSC:
Transport road provides a hard paved surface for the tractor to transport spent fuel in a NUHOMS®-24P canister/transfer cask from the Auxiliary Building to the ISFSI.

ISFSI USAR Sections Reviewed:
Vol.. IV, Section 2; Vol. I, Section 4.1.1; Vol. I, Section 10.3

1) Change USAR Volume I, Section 10.3.4.1, Item B. Specifications, first paragraph (as revised by 72.48 #94-0-101-003) to read:

"The roadway or ground surface elevation perpendicular to the route to or from the ISFSI within an 8.0 ft proximity of the transfer trailer shall not be more than 20 inches below the trailer road surface centerline elevation. The paved portion of the road shall be a minimum of 16 feet wide and the adjacent paved, gravel or soil shoulder shall extend to make the transfer route at least 28 feet wide. The lowest point within the 28 foot wide transfer route shall not be lower than 20 inches below the road centerline and may contain typical roadside features, including curbs, fences, guard rails and light poles which do not constitute potential puncture mechanisms for the cask. The shoulders may not contain items such as light pole pedestals which protrude above the shoulder surface and could represent a potential cask puncture mechanism. The components associated with the vehicle barrier system, installed adjacent to the Nuclear Security Facility and closing the 16 foot wide ISFSI haul road at the Protected Area boundary, have been analyzed and do not represent a puncture risk to the transfer cask. The road shall be closed to other vehicles when transporting spent fuel."

ATTACHMENT 3, POSRC/PRC PRESENTATION FORM

POSRC/PRC PRESENTATION FORM

Presentation Date:

Presenter: **M. A. Carr** — Extension: **6848**

Procedure or Activity: **ISFSI USAR Change due to Vehicle Barrier System Upgrade Modification (ES199501089-000)**

Purpose of Presentation:

- [x] Recommendation for Approval
- [x] Information
- [ ] Close OI
- [ ] Extend OI

Activity Summary: (See POSRC/PRC Presenter's Guide III.A.1): **ES199501089 (FCR 95-0201) will upgrade the site's vehicle barrier systems to prevent access by a bomb carrying malevolent vehicle within the safe standoff distance of selected SSCs. All of the new barriers will be outside the Protected Area and are NSR. One barrier will cross the ISFSI haul road, adjacent to the NSF Sallyport. The ISFSI haul road has restrictions on the types of items which may be installed within the 28 foot wide transfer route. No items which represent a puncture mechanism to the spent fuel transfer cask (TC) may be installed in this zone. BGE Calculation C-95-0185 shows the required dimensions for the barrier not to pose a puncture risk to the TC. The proposed ISFSI USAR change explicitly provides for the proposed vehicle barrier to be present within the ISFSI haul road's 28 foot width.**

In addition, spent fuel moves are scheduled throughout the construction period. Restrictions are proposed for the construction period to ensure the limitations of the ISFSI USAR are not violated during fuel movements durng the construction period.

Safety Issues Involved: (See POSRC/PRC Presenter's Guide II.B, C, D, E, and III.A.2): **The design basis accident is the drop of the TC while moving spent nuclear fuel. BGE Calculation C-95-0185 shows that the loads imposed by the proposed barrier components are enveloped by the existing TC drop analysis.**

Recommendations to POSRC or PRC: (See POSRC/PRC Presenter's Guide II.F, G, H, and III.A.3 and F):
Recommend approval of the Safety Evaluation and USAR change, with the following precautionary actions:
(to NFM) Spent fuel transfers to or from the ISFSI will be prohibited from the time the construction of the ISFSI haul road vehicle barrier adds any above-ground component until construction of the components within the 28 foot wide transfer route is essentially complete.
(to Project Management) Work progress will be coordinated by the Project with NFM to minimize disruption of scheduled fuel moves.
(to Project Management) Excavations within the 28 foot transfer route may not exceed 20 inches during the period of any fuel moves; and, no tools or equipment which could represent a puncture threat to the TC may be present within the 28 foot transfer route during spent fuel moves.

SAFETY EVALUATION FORM
(Attachment 3)

ACTIVITY: ES199600014	50.59 LOG NO: XXXXX	72.48 LOG NO: SE00002

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

☐ Yes ☒ No Involve an unreviewed safety question (USQ)?

☐ Yes ☒ No Involve a change in the Technical Specifications/License Conditions or Bases?

☒ Yes ☐ No Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations:

☐ Yes ☒ No Involve a significant increase in occupational dose?

☐ Yes ☒ No Involve a significant unreviewed environmental impact?

Prepared by:	M. A. Carr *M.A.Carr* *G.V. Patel* *G.V PATEL*	Department: NED/DES/CEU	Date: ~~2/16/96~~ 2/20/96

(Printed Name and Signature)

☒ Yes ☐ No Is a special review required by groups other than the group to which the Preparer belongs?

(Printed Name and Signature)

Responsible Indiv:	C. G. Sarau *Charles Sarau*	Work Group: Facilities Svcs	Date: 2/20/96
Responsible Indiv:	E. M. Tyler *Em Tyler*	Work Group: Licensing	Date: Feb 16, 96
Responsible Indiv:		Work Group:	Date:
Independ reviewer:	K.C. ANSTEE *KC Anstee*	☒ Approved ☐ disapproved	Date: 2/21/96
GS-DES/GS-TSES/PE-PDSU	MICHAEL J. GAHAN III *Michael J. Gahan*	☒ Approved ☐ disapproved	Date: 2/21/96
The POSRC has reviewed this evaluation to NS-2-101. Recommend: ☒ Approval ☐ Disapproval	POSRC Meeting No.: 96-17 *John T. Carroll* POSRC Chairman	Date: 2-26-96 Date: 2-26-96
Recommend: ☒ Approval ☐ Disapproval	*P.E. Katz* Plant General Manager		Date: 2/26/96
The OSSRC has reviewed this evaluation to NS-2-100. Recommend: ☒ Approval ☐ Disapproval	OSSRC Meeting No.: SES *J.S. Russell* OSSRC Chairman		Date: 7-1-96 Date: 7-2-96

FORM MEETS INTENT OF REV 3 *M.A.Carr* 2/16/96

ACTIVITY: ES199600014	50.59 LOG NO: XXXXX	72.48 LOG NO: SE00002

Proposed Activity: The underground storage tanks at the heavy duty lube shop were replaced by new underground storage tanks (USTs) at the Transportation Facility (TF) when the lube shop was demolished to facilitate construction of the Nuclear Office Facility (NOF). These new tanks are two 4000 gallon tanks for gasoline and diesel fuel and one 550 gallon tank for storage of waste oil.

Reason for Activity: This 72.48 evaluates the location of the USTs, which is closer to the ISFSI haul road and larger than stated in correspondence to the NRC (now part of the USAR in Appendix A, Q&A). The original USTs were approximately 200 feet from the spent fuel transfer route. The current location is approximately 70 feet from the transfer route. The USTs were described as two 3000 gallon tanks. The new USTs are two 4000 gallon tanks and one 550 gallon tank.

Function(s) of affected SSC: The affected SSC is the ISFSI spent fuel transfer route. This route is used to transport spent nuclear fuel in the Transfer Cask and Dry Shielded Canister from the CCNPP Aux Building to the ISFSI.

SAR Sections Reviewed: ISFSI USAR Vols I, III, and IV.

Complete 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

☐ Yes ☒ No May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction: The pre-license Q&A correspondence and the Safety Evaluation Report acknowledged the presence of the original refueling depot. However, the evaluation found underground storage of fossil fuels meeting NFPA 30-1987, *Flammable and Combustible Liquid Code,* was not of concern, but a tanker truck carrying fossil fuels represented a risk to be avoided. The consequences of a fossil fuel carrying tanker truck induced fire or explosion accident have not been analyzed for the transfer cask. As a result, restrictions were placed on the allowed location (>100 meters from transfer route) and movement of tanker trucks inside the plant main entrance (no movement allowed) while spent fuel transfer operations are in progress. These restrictions are not changed due to the relocation of the TF. None of the accidents or malfunctions of equipment important to safety evaluated in the SAR involve the TF USTs. Therefore, there is no increase in the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR.

☐ Yes ☒ No May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction: See the answer, above.

☐ Yes ☒ No May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident: See the answer, above.

☐ Yes ☒ No May the consequences of an accident previously evaluated in the SAR be increased:

Consequences of Accident: See the answer, above.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

☐ Yes ☒ No May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

ACTIVITY: ES199600014	50.59 LOG NO: XXXXX	72.48 LOG NO: SE00002

Probability of New Malfunction: The USAR analyzed the code-required stand-off distance for USTs (NFPA 30-1987, *Flammable and Combustible Liquid Code*). Underground storage of flammable and combustible liquids is considered the safest form of storage, The NFPA-specified minimum distance is 25 feet. The refueling depot dispensing pumps, USTs and their tank vents are all approximately 70 feet, or further, from the nearest side of the ISFSI spent fuel transfer route.

☐ Yes ☒ No May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of a New Accident: See the answer, above.

COMPLETE FOR 50.59 AND 72.48:

3. The margin of safety as defined in the basis for any Technical Specification is not reduced.

☐ Yes ☒ No May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

BASES	DISCUSSION OF WHY THE MARGIN OF SAFETY IS NOT REDUCED
3/4.5 Fire Protection	The basis acknowledges the proximity of the refueling depot and reiterates the objective of the Tech Spec is to preclude an accident involving fire or explosion near the TC due to a large amount of fossil fuels. The preclusion of tanker trucks within 100 meters ensures there will be no tanker truck at the TF during spent fuel moves to the ISFSI.

COMPLETE FOR 72.48:

☐ Yes ☒ No Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose: Relocating the TF did not change the spent fuel transfer route, therefore, there are no delays in spent fuel transfer operations which would increase occupational dose due to the location of the TF.

☐ Yes ☒ No Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact: Changing the location of the TF and increasing the UST sizes by such a small amount (1000 gallons each) does not represent a significant unreviewed environmental impact. In addition, the TF was permitted by Calvert County under their building and environmental permitting process. Any environmental impacts caused by TF construction were addressed under that permitting process.

SUMMARY: (For NRC Report, provide a brief overview)

The location of the Transportation Facility was changed during construction of the Nuclear Office Facility (NOF) to a location east of the ISFSI spent fuel transfer route. The new location is closer to the transfer route than stated in the SAR (Appendix A, Q&A, Question 8.0-6), but still outside the NFPA 30-1987 specified setback of 25 feet. As well, the size and number of underground storage tanks was increased from two 3000 gallon tanks to two 4000 gallon tanks and one 550 gallon tank for diesel fuel, gasoline, and waste oil, respectively. This change does not represent a USQ because the USTs are still outside the NFPA setback requirements. In addition, the new location is such that the 100m tanker truck exclusion zone will preclude fuel deliveries during the time of spent fuel transfer operations from the CCNPP Aux Building to the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

Independent Spent Fuel Storage Installation Safety Evaluation		72.48 Log No: SE00003
ES199601368	Supplement 000	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO	Involve an unreviewed safety question (USQ)?
NO	Involve a change in the Technical Specifications/License Conditions or Bases?
YES	Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO	Involve a Significant Increase in Occupational Dose?
NO	Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk ________ Department: NED-CEU 42-01-04 Date: 8-30-96
PRINTED NAME AND SIGNATURE

DE Reviewer: J. N. Woodfield ________ Department: NED-CEU 42-01-04 Date: 8/30/96

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. L. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
8/30/96 SIGNATURE / DATE	8/30/96 SIGNATURE / DATE	8/30/96 SIGNATURE / DATE

Approved Disapproved

Signature: M.A. CARR
INDEPENDENT REVIEWER

Date 8/30/96

Approved Disapproved

Signature: ________
GS-DES, GS-TES, or PE-PDSU

Date 8·30·96

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 96-110[redacted] Date: 8·30·96

Recommend Approval ✓ Recommend Disapproval ______ Signature: ________ Date 8-30-96
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: ________ Date 8-30-96
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

OSSRC Meeting No.: .: 97-01 Date: 1/16/97

Recommend Approval ✓ Recommend Disapproval ______ Signature: ________ Date: ______
OSSRC CHAIRMAN

ATTACHMENT 3, SAFETY EVALUATION FORM

Proposed Activity: A technical review of ISFSI documentation that was submitted to and received by the NRC in 1992, but was never reviewed by the NRC, detected a discrepancy that will require a revision to the ISFSI USAR

Proposed ISFSI USAR Change: Change the description of the DSC insertion as described in Section 4.2.3.2 to reflect the deletion of dry lubricant from the DSC shell and the addition of Nitronic hard sliding rails to the TC and HSM. This change was fully evaluated and justified in 1991 by Pacific Nuclear Services, Inc., and approved by BGE for construction.

Reason for ISFSI USAR Change: The DSC is designed to slide from the TC into the HSM and back without undue galling, scratching, gouging, or other damage to the sliding surfaces. Substantial galling had been observed in a similar application of the dry lubricant to the DSC shell. The addition of the Nitronic rails was made as a design improvement, and testing in similar applications was found to perform substantially better than the previous design. BGE approved this design change for construction in 1991. The ISFSI license was issued in November of 1992, and ISFSI loading operations began in November of 1993. All ten fuel moves to date have resulted in a smooth transfer of the DSC from the TC into the HSM without any damage to the sliding surfaces.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are three major components of the NUHOMS-24P system that are addressed in this safety evaluation. Those three components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); and 3) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those three components.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules will be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DCS contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for temporary storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide temporary storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

SAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.4, 3.6, 4.2, 4.7, 5.1, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

Independent Spent Fuel Storage Installation Safety Evaluation		72.48 Log No: SE00003	
ES199601368	Supplement 000	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. The possible malfunction for the DSC insertion would involve the complete stoppage of the insertion process due to undue galling, scratching, gouging, and damage to other sliding surfaces. The proposed USAR change involves the deletion of dry lubricant from the DSC shell and the addition of Nitronic hard sliding rails to the TC and HSM. As such, the rails are coated with dry film lubricants in lieu of the DSC. Similar applications at other ISFSI sites have been seen to perform substantially better than the previous design. In addition, since ISFSI loading operations began in November of 1993, all ten fuel moves to date have resulted in a smooth transfer of the DSC from the TC into the HSM without any damage to the sliding surfaces. This is considered a design improvement which will reduce the probability of a DSC insertion malfunction.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. The consequences of a complete stoppage of the DSC insertion would result in placing the DSC safely back into the TC. The proposed USAR change is a design improvement which would allow the restoration process to occur in a more timely manner. As such, the consequences of a DSC insertion malfunction would not be increased.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this proposed activity. One accident scenario described in the ISFSI USAR assumes that the spent fuel rods and the DSC pressure boundary are ruptured and leakage occurs due to an event of unspecified origin. The origin of rupture during the DSC insertion process would be the sliding surfaces. It has been previously stated that the proposed USAR change involves the deletion of dry lubricant from the DSC shell and the addition of Nitronic hard sliding rails to the TC and HSM. This change, which occurred in 1991, was found to perform better than the previous design at other sites. In addition, this design has resulted in ten successful spent fuel moves. Most notably, the Nitronic hard sliding rails have provided a mechanism for the smooth, damage free transfer of our DSC's from the TC to the HSM. Since the probability of damage to the DSC via the DSC transfer process has been reduced, the probability of occurrence of the DSC leakage accident previously evaluated in the ISFSI USAR will not be increased.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. There are no structural or thermal consequences, and only minimal radiological consequences resulting from the DSC leakage accident as described in the ISFSI USAR. Since the design change has resulted in a smooth, damage free operation, no potential consequences are introduced that could increase the consequences of the DSC leakage accident described in the ISFSI USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

Independent Spent Fuel Storage Installation Safety Evaluation		72.48 Log No: SE00003	
ES199601368	Supplement 000	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. The addition of the Nitronic hard sliding rails, which are ¼" thick and 3" wide, to the existing support rails, has been evaluated by structural calculations to have no adverse impact on the structural adequacy of the ISFSI design.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. No new accident scenarios are created as a result of the addition of the Nitronic hard sliding rails to the TC and HSM.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The design change was an improvement to the transfer operation of the DSC from the TC to the HSM, and as such, does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

Independent Spent Fuel Storage Installation Safety Evaluation		72.48 Log No: SE00003	
ES199601368	Supplement 000	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: A technical review of ISFSI documentation that was submitted to and received by the NRC in 1992, but was never reviewed by the NRC, detected a discrepancy that will require a revision to the ISFSI USAR

Proposed ISFSI USAR Change: Change the description of the DSC insertion as described in Section 4.2.3.2 to reflect the deletion of dry lubricant from the DSC shell and the addition of Nitronic hard sliding rails to the TC and HSM. This change was fully evaluated and justified in 1991 by Pacific Nuclear Services, Inc., and approved by BGE for construction.

Reason for ISFSI USAR Change: The DSC is designed to slide from the TC into the HSM and back without undue galling, scratching, gouging, or other damage to the sliding surfaces. Substantial galling had been observed in a similar application of the dry lubricant to the DSC shell. The addition of the Nitronic rails was made as a design improvement, and testing in similar applications was found to perform substantially better than the previous design. BGE approved this design change for construction in 1991. The ISFSI license was issued in November of 1992, and ISFSI loading operations began in November of 1993. All ten fuel moves to date have resulted in a smooth transfer of the DSC from the TC into the HSM without any damage to the sliding surfaces.

Activity Summary: After a thorough and intense review, it has been concluded that the proposed activity:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

√ YES NO Involve an unreviewed safety question (USQ)?
YES √ NO Involve a change in the Technical Specifications/License Conditions?
√ YES NO Require a change or addition to the UFSAR/USAR/Technical Specification Bases?

Applicable to 10 CFR 72.48 Safety Evaluations

YES √ NO Involve a Significant Increase in Occupational Dose?
YES √ NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: K. C. Anstee K. C. Anstee Department: DES-CEU Date: 01/25/99
PRINTED NAME AND SIGNATURE

√ YES NO Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: J. L. Stone Work Group: Reliability Eng.	Resp. Indv.: A. L. Simpson Work Group: Licensing	Resp. Indv.: R. H. Beall Work Group: Nuclear Fuels
J L Stone 1/25/99 SIGNATURE / DATE	1-26-99 SIGNATURE / DATE	R H Beall 1-26-99 SIGNATURE / DATE

Approved Disapproved

Signature J.E. Remeniuk
INDEPENDENT REVIEWER

Date 1-27-99

Approved Disapproved

Signature Michael J. Gekara
for ~~GS-DES~~, GS-TES, or PE-PDSU

Date 1-27-99

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 99-008 Date: 2-3-99

Recommend Approval ✓ Recommend Disapproval ______

Signature Date 2-3-99
POSRC CHAIRMAN

Approved ✓ Disapproved ______

Signature Date 2/4/99
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes X No ______

Signature: Date: 5/13/99
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: 99-03

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

Proposed Activity: Section 2.2.1.1 of the Independent Spent Fuel Storage Installation (ISFSI) USAR is related to information on aircraft and their flight paths for Patuxent River Naval Air Station. The above noted section is outdated and will be updated under this activity.

Reason for Activity: The purpose of this activity is to revise Section 2.2.1.1 of the ISFSI USAR to reflect the current information on aircraft and their flight paths for Patuxent River Naval Air Station.

Function(s) of affected SSC: This change affects the entire Independent Spent Fuel Storage Installation.

ISFSI USAR Revision No.: 7

Tech Spec Bases Rev. No.: 1

ISFSI USAR Sections reviewed: Chapter 2, 3, 8, and the electronic docket.

Tech Spec Bases Reviewed: Entire Bases for Sections 2.0 and 3/4.0

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

YES √ NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

Aircraft hazard is an external event which is not specifically addressed or identified within the Chapter 8 accident analysis. Section 2.2 of the ISFSI USAR provides a description of existing airports, a description of some of the aircraft using them, weight of the heaviest aircraft at Patuxent River Naval Air Station, the number of take-offs and landings, and flight paths. Within this description of airports it is noted that aircraft at Patuxent River Naval Air Station would come no closer than seven miles to the ISFSI.

The actual aircraft hazard during original construction and licensing of the ISFSI was never quantified. This was due to the fact that the aircraft conditions were the same for both the ISFSI and CCNPP along with the fact that aircraft hazard for CCNPP (which was also never quantified) was judged to be acceptably low by the NRC at the time of construction and licensing of CCNPP. Section 3.1.2 of the Safety Evaluation by the Directorate of Licensing U.S. Atomic Energy Commission in the Matter of BGE CCNPP Units 1 & 2 dated 8/28/72 stated the following:

> "Considering the relatively small number of aircraft movements at these airports and their distances from the Calvert Cliffs site, the applicant concluded and we concur, that the probability of an aircraft crash affecting the plant is so low that no special design provisions should be made in the plant for such an event."

The above statement implies that the probability of an aircraft accident resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines was less than 10^{-7} per year. Regulatory Guide 1.70 (Reference 1), which is utilized herein as a guideline (BGE is not committed to the Reference 1 Regulatory Guide), states that if the probability of an accident is on the order of 10^{-7} per year or greater, the accident should be considered a design basis event, and a detailed analysis of the effects of the accident on the plant's safety-related structures and components should be provided.

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

Probability of Malfunction (continued):

From the above discussion, it can be seen that at the time of original ISFSI design and construction that aircraft hazard was not considered a design basis event for the ISFSI due to it not being considered a design basis event for CCNPP. This in turn meant that it was not considered to be a malfunction initiator for the ISFSI which subsequently meant that any equipment important to safety would not be impacted and/or degraded.

With the above historical discussion now presented, the current aircraft hazard will be discussed. A very detailed aircraft hazards analysis (Reference 4) has been developed for the ISFSI in accordance with Section 3.5.1.6 of Reference 1. The Reference 4 analysis evaluates the following as directed by Section 3.5.1.6 of Reference 1:

1) Federal airways or airport approaches passing within 2 miles of the site.
2) All airports located within 5 miles of the site.
3) Airports with projected operations greater than $500d^2$ movements per year located within 10 miles of the site and greater than $1000d^2$ outside 10 miles, where d is the distance in miles from the site.
4) Military installations or any airspace usage that might present a hazard to the site. For some uses such as practice bombing ranges, it may be necessary to evaluate uses as far as 20 miles from the site.

There are eight airways situated in the vicinity of the ISFSI (References 2 & 3). Four (J14, J191, J61, and J37) are high altitude airways, and four (V31, V93, V16-157-213-229, and V20-33) are low altitude airways. References 2 & 3 show that only two of these eight airways (V31 and V93) meet the requirements for analysis stated in Section 3.5.1.6 of Reference 1 (i.e., the ISFSI either lies within the airway or is located less than two miles from one of the airway's outer borders). The other high and low altitude airways pass further than two miles from the ISFSI. The Reference 4 analysis determined that the total probability of an aircraft crash resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines, due to these airways, is 2.90×10^{-7} cr/yr. Reference 5 revisited this calculated probability and removed the "built-in" conservatism which in turn resulted in a revised probability of 5.45×10^{-8} cr/yr.

A helipad is located at the northern end of the site more than a 1,000 feet from the ISFSI. Generally, this helipad is used for corporate flights from BGE headquarters (Baltimore) and for an estimated six Medivac helicopter flights per year. Helicopter Transport Services, Inc., of Baltimore, MD, has indicated that the helicopter used to transport BGE personnel to and from the plant site is a Bell 206L helicopter weighing less than 3,000 pounds. This puts the helicopter in the NUREG/CR-5042 (Reference 6) category of "less than 12,000 pounds". The Medivac helicopter would also fall into the "less than 12,000 pounds" category. Table 6.4.2 of Reference 6 provides the probability of penetration of plant structures as a function of plant location, aircraft weight, and concrete thickness. Utilizing this table, knowing the ISFSI outer shell is composed of concrete at least three feet thick, the probability of a helicopter originating from an airport less than five miles from the ISFSI and penetrating the ISFSI is zero. Since the probability of penetration is zero, helicopter operations do not contribute to the overall total probability of aircraft accidents.

Besides the helipad, there is only one other air strip located within 5 miles of the ISFSI. The privately operated air strip, Mears Creek, is only sporadically used for leisure purposes by its owner/operator. Two small single-engine aircraft are based there and are the only aircraft that are expected to use the field. It can be reasonably assumed that these aircraft are not of the type that would approach 12,000 pounds in weight. For these reasons, the Mears Creek operations will not be considered any further in the overall total probability of aircraft accidents.

There are two airports (Chesapeake Ranch Airport and St. Mary's County Airport) which are located within ten miles of the ISFSI. Chesapeake Ranch Airport is approximately 6 miles southeast of the ISFSI. Flight traffic is

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

Probability of Malfunction (continued):

greatest during the summer with approximately six flights per week. Conservatively assuming this rate throughout the year would result in a total of slightly over 300 flights per year. For airports between five and ten miles from the ISFSI, the criterion of projected operations greater than $500d^2$ movements per year from Section 3.5.1.6 of Reference 1 can be calculated as $500 \times 6^2 = 18{,}000$ which is much greater than the estimate of 300 flights per year. Therefore, Chesapeake Ranch Airport will not be considered as a source of potential aircraft hazard. St. Mary's County Airport is approximately 10 miles southwest of the ISFSI with an estimated 3,400 flights per month, or 40,800 flights per year. Utilizing the above noted criterion of $500d^2$ results in $500 \times 10^2 = 50{,}000$ which is greater than the estimate of 40,800 flights per year. Therefore, St. Mary's County Airport will not be considered as a source of potential aircraft hazard.

Patuxent River Naval Air Station (Pax River NAS) is approximately 11 miles south of the ISFSI. There have been as many as 100,000 takeoffs and landings per year, though the projection for the next several years is 50,000 to 60,000 per year. The 100,000 flight figure is approximately equal to the number of flights that would be calculated as a screening criterion. therefore, Pax River NAS is considered to be a source of aircraft hazard.

The instrument approach landing and takeoff patterns for Pax River NAS are shown in References 7 & 8. It should be noted that, according to Patuxent River Air Operations, the exact flight paths shown in References 7 & 8 are used only in the event of loss of radar contact with the aircraft (and in training runs for such scenarios). Normally, the initial point for approach is at four miles from the air station, so approaches to Pax River NAS would, in most cases, remain seven miles from the ISFSI and plant site.

Three of the patterns (TACAN RWY 14, TACAN 1 RWY 24, and TACAN 1 RWY 32) displayed in References 7 & 8 approach the ISFSI and plant site. All of these are shown passing at a ten nautical mile radius from Pax River NAS, effectively flying planes directly overhead. Generally, planes shouldn't come any closer than 3 miles from the ISFSI since the Navy Airman's Information Manual directs pilots specifically to avoid flyovers of the CCNPP site. Pax River NAS Air Operations indicates that pilots are generally sent on three mile bypass loops around the CCNPP site to avoid such flyovers.

The TACAN RWY 14 approach depicted in Reference 8 is only used in sporadic training runs, as the normal initial point for overhead approach is four nautical miles out. The ten-mile radial pattern is only used (other than in training) if all radar contact with the aircraft is lost. The TACAN 1 RWY 24 and TACAN 1 RWY 32 ten mile radius patterns would be used only if there were a missed approach on a normal runway 24 or 32 landing <u>and</u> radar contact could not be maintained with the pilot of the aircraft. An actual Naval Facilities Engineering Command count of air traffic provided by Pax River NAS revealed that only 214 planes used these three routes in the past year. Utilizing the information discussed above, the Reference 4 analysis determined that the total probability of an aircraft crash resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines, due to Pax River NAS aircraft movement, is 8.72×10^{-9} cr/yr. Reference 5 revisited this calculated probability and utilized a more realistic military effective area along with a more reasonable probability of penetration which in turn resulted in a revised probability of 3.43×10^{-9} cr/yr.

Military usage of airspace in the vicinity of the site is generally covered by the activities at Pax River NAS and the military flights in local airways, both of which were previously mentioned above. Due to this and the lack of any other data suggesting otherwise, the Reference 4 analysis assumed that the overall rate for aircraft crashes due to military/other airspace usage was equal to 0 cr/yr. However, this is now known not to be true since military jet planes, which were determined to be from Andrews Air Force Base, were observed flying at a low altitude directly over the CCNPP site in December 1997. No exact data exists for this type of infrequent "random" non-airway type

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

Probability of Malfunction (continued):

of military flight. However, the potential hazard from this type of "random" non-airway type of military flight will be addressed later on in this "Probability of Malfunction" section.

The Department of Energy (DOE) conducts periodic radiation surveys over the plant site. As was noted on Page 3 of this Safety Evaluation, Table 6.4.2 of Reference 6 provides the probability of penetration of plant structures as a function of plant location, aircraft weight, and concrete thickness. Utilizing this table, knowing the ISFSI outer shell is composed of concrete at least three feet thick, the probability of the DOE helicopter penetrating the ISFSI is zero. Since the probability of penetration is zero, the DOE helicopter operations do not contribute to the overall total probability of aircraft accidents.

Without consideration of the "random" non-airway type of military flight, the total frequency of an aircraft crash resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is determined by summing the following:

• Aircraft crash frequency due to airways within 2 miles of the plant:	5.45×10^{-8} cr/yr.
• Aircraft crash frequency from airports within 5 miles of the site:	0 cr/yr.
• Aircraft crash frequency from Pax River NAS aircraft movement:	3.43×10^{-9} cr/yr.
• Aircraft crash frequency due to military/other airspace usage:	0 cr/yr.
• Aircraft crash frequency due to DOE radiation survey:	0 cr/yr.
Total crash frequency (probability)	5.79×10^{-8} cr/yr.

On Page 3.5.1.6-2 of NUREG-0800 (Standard Review Plan), Section 3.5.1.6 (Aircraft Hazards), which is utilized herein as a guideline (BGE is not committed to the Standard Review Plan), it states the following:

> "10 CFR Part 100, Section 100.10 as it relates to indicating that the site location, in conjunction with other considerations (such as plant design, construction, and operation), should insure a low risk of public exposure. This requirement is met if the probability of aircraft accidents resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is less than about 10^{-7} per year."

As noted above, the total probability of an aircraft crash resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is equal to 5.79×10^{-8} per year for the ISFSI, when ignoring "random" non-airway type of military flight, which is below the stated SRP level of acceptability of 1.0×10^{-7} per year.

The Reference 5 analysis looked at "random" non-airway flights occurring within various diameter circles utilizing the ISFSI as the center of the circle. A circle is utilized as the airway width since the aircraft could come from any direction.

Utilizing the following diameter circles, the number of "random" non-airway military flights that could occur, while still remaining below the SRP level of acceptability of 1.0×10^{-7} per year, are as follows:

• One mile circle	Number = 245/year
• One thousand foot circle	Number = 46/year

Though there is no existing data associated with the number of "random" non-airway military flights, general observations around the site conclude that it is apparent that flights directly over the ISFSI are relatively rare. It is unlikely that the number of actual "random" military flights significantly exceed the above stated values.

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

Probability of Malfunction (continued):

Therefore, the probability of an aircraft accident which could result in an offsite exposure level exceeding 10 CFR 100 limits is considered to be below the SRP level of acceptability of 1.0×10^{-7} per year.

From the above discussion on the current aircraft hazard for the ISFSI, it can be concluded that aircraft hazard is not a malfunction initiator since the probability of an aircraft accident resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is acceptably low. Therefore, it is concluded that any equipment important to safety will not be adversely impacted and/or degraded.

YES √ NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

In the above section it was shown that aircraft hazard does not have to be considered a design basis concern for the ISFSI since the calculated probability of an aircraft accident resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is considered to be below the SRP level of acceptability of 1.0×10^{-7} per year. Changes to aircraft flight patterns and/or probability has no affect on the design or method of operating equipment important to safety. Thus, it can be concluded that all equipment important to safety will operate as originally analyzed.

Based on the above, it is concluded that the current calculated aircraft hazard will not result in increased radiological consequences and will not increase the consequences of a malfunction of any equipment important to safety that has been previously evaluated in the SAR.

√ YES NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of an aircraft crash was not quantified during the timeframe of licensing and construction of the ISFSI. The existing aircraft hazard noted within the ISFSI USAR was derived from the CCNPP UFSAR where it was noted that aircraft from/to Pax River NAS would be no closer than approximately seven miles from the plant. As was noted on Page 2 of this safety evaluation (under the "Probability of Malfunction" section), the Directorate of Licensing at the U.S. Atomic Energy Commission concurred with BGE's conclusion that no special design provisions were required to be incorporated into CCNPP because the probability of an aircraft crash affecting the plant was acceptably low (implies a probability of less than 10^{-7}/year). Therefore, based on the CCNPP UFSAR the probability of an aircraft crash affecting the ISFSI was acceptably low at less than 10^{-7}/year.

In the above "Probability of Malfunction" section it was noted that the probability of an aircraft accident resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is below the SRP level of acceptability of 1.0×10^{-7} per year for the ISFSI. The probability of an aircraft accident during the timeframe of original construction and licensing of the ISFSI was never quantified. Since today's probability of an aircraft accident may be higher based on the fact that, at times, aircraft going into Pax River NAS fly practically overhead where previously they came no closer than seven miles from the ISFSI (as described in the USAR), the probability of occurrence of an accident will conservatively be considered to have increased. However, it should be noted that

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

Probability of Accident (continued):

the probability of an aircraft accident resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is considered to be below the SRP level of acceptability. Since the above probability of an aircraft accident is acceptably low, no additional design or procedural protection is required.

YES √ NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

Changes to the aircraft flight patterns and/or frequency (probability) have no affect on the design or method of operating equipment necessary to mitigate the consequences of previously analyzed accidents. As was noted above, the aircraft hazard is considered to be acceptably low and therefore no additional design or procedural protection is required for the ISFSI. Since the aircraft hazard is considered acceptably low (where additional design features are not required), it can be concluded that no action assumed to occur within the accident analysis of Chapter 8 will be degraded or prevented. Therefore, it is concluded that the current calculated aircraft hazard will not result in an increase of the Consequences of an Accident previously evaluated in the SAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

YES √ NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

All possible malfunctions have been previously analyzed. Aircraft hazard was addressed within the original design of the ISFSI. The frequency/probability of an aircraft crash was considered to be so low that special design provisions to protect against aircraft crashes did not have to be considered during construction of the ISFSI. The current calculated aircraft hazard is considered to be below the SRP level of acceptability of 1.0×10^{-7} per year. The possibility for a malfunction of a different type than any previously evaluated in the SAR is not created.

YES √ NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

As was noted above, aircraft accidents were considered within the original ISFSI design. The probability of an aircraft accident resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is still acceptably low and no special design provisions are required. Since an aircraft crash is not a design basis concern, it is not plausible that the possibility of a new accident is created which has not been previously evaluated in the SAR. There are also no new challenges to safety related equipment.

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any Technical Specification is not reduced.

YES √ NO Will the margin of safety as defined in the basis for any Technical Specification be reduced?

Bases:

CCNPP Unit 1 & 2 Technical Specifications
ISFSI Technical Specifications

Discussion of why the margin of safety is not reduced

The CCNPP and ISFSI Technical Specifications do not address or consider aircraft hazards for the ISFSI since the probability of an aircraft crash affecting the ISFSI, at the time of licensing and construction, was considered to be so low that no special design provisions were needed in the ISFSI for such an event. Since aircraft hazards did not have to be considered within the design of the ISFSI, no Margin of Safety was required or established for such a hazard. All of the assumptions stipulated within the Chapter 8 accident analysis would not be affected by such an event.

The calculated probability of an aircraft accident resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines, based on today's aircraft hazard, remains acceptably low and is considered to be below the SRP level of acceptability of 1.0×10^{-7} per year. Therefore, there is still no need for special design provisions within the ISFSI to guard against such an event. All of the assumptions stipulated within the Chapter 8 accident analysis remain unchanged. The ISFSI will continue to operate in such a manner that will ensure acceptable levels of protection for the health and safety of the public.

Complete for 72.48:

YES √ NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

As was noted previously, the probability of an aircraft accident resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is considered to be below the SRP level of acceptability of 1.0×10^{-7} per year. Therefore, since the requirements of 10 CFR Part 100 are maintained, it can be concluded that there will be no significant increase in occupational dose.

YES √ NO Will the proposed activity involve a significant unreviewed environmental impact?

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

A significant unreviewed environmental impact:

The aircraft hazard is an external event which will not create an environmental impact. As noted above, the frequency of an aircraft accident resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is considered to be below the SRP level of acceptability of $1.0x10^{-7}$ per year. Therefore, it can be concluded that the aircraft hazard does not create a significant unreviewed environmental impact.

References:

1) USNRC Regulatory Guide 1.70, Rev. 3, November 1978.
2) United States Government Flight Information Publication, IFR Enroute High Altitude - US Area H-6, January 1996.
3) United States Government Flight Information Publication, IFR Enroute Low Altitude - US Area L-28, January 1996.
4) NUS Calculation LA16.ISFSI Rev. 0 (BGE Calculation CA04039 Rev. 0), Aircraft Hazards Analysis for the Independent Spent Fuel Storage Installation.
5) Reliability Engineering Calculation 97-034 Rev. 3, IPEEE other External Event Analysis.
6) NUREG/CR-5042, "Evaluation of External Hazards to Nuclear Power Plants in the United States", U.S. Nuclear Regulatory Commission, 1987.
7) Department of Defense Flight Information Publication, High Altitude United States Airport Diagrams - NE, April 1995.
8) Department of Defense Flight Information Publication, Low Altitude United States Airport Diagrams - VOL-10, May 1995.
9) Data Development Technical Support Document for the Aircraft Crash Risk Analysis Methodology (ACRAM) Standard (Draft). Lawrence Livermore National Laboratory, April 1995.
10) Summary of air traffic over the fix PXT, FAA Eastern Region, February 7, 1996. (also Attachment 4 under NUS Calculation LA16.AHA [BGE Calculation CA04040]).

Summary: (For NRC Report)

This activity, ESP ES199601328-001, revises the information currently provided within Revision 7 of the ISFSI USAR, under Section 2.2.1.1, on aircraft and their flight paths for Patuxent River Naval Air Station (Pax River NAS). The above noted section is outdated and does not reflect current conditions for aircraft utilizing Pax River NAS.

The actual aircraft hazard during original construction and licensing of the ISFSI was never quantified. This was due to the fact that the aircraft conditions were the same for both the ISFSI and CCNPP along with the fact that aircraft hazard for CCNPP (which was also never quantified) was judged to be acceptably low by the NRC at the time of construction and licensing of CCNPP. Section 3.1.2 of the Safety Evaluation by the Directorate of Licensing U.S. Atomic Energy Commission in the Matter of BGE CCNPP Units 1 & 2 dated 8/28/72 stated the following:

> "Considering the relatively small number of aircraft movements at these airports and their distances from the Calvert Cliffs site, the applicant concluded and we concur, that the probability of an aircraft crash affecting the plant is so low that no special design provisions should be made in the plant for such an event."

ATTACHMENT 3, SAFETY EVALUATION FORM

ACTIVITY: ES199601328-001 **50.59 Log No.:** **72.48 Log No.: SE00004**

<u>Summary: (For NRC Report) [continued]</u>

As part of CCNPP's Individual Plant Examination for External Events (IPEEE), a very detailed calculation was developed to address aircraft hazards for the ISFSI. This calculation addressed all of the hazards as directed by Section 3.5.1.6 of Regulatory Guide 1.70 (Reference 1) such as airways (V31 and V93) within 2 miles of the ISFSI, airports (the helipad at CCNPP and the Mears Creek air strip) within 5 miles of the ISFSI, airports (Chesapeake Ranch Airport and St. Mary's County Airport) within 10 miles of the ISFSI, Pax River NAS aircraft movement, and military/other airspace usage that might present a hazard to the ISFSI. Also, the Reference 5 calculation considered the hazard from the radiation survey that the DOE performs by flying a helicopter over the plant site several times. The results of this calculation (Reference 4) along with the Reference 5 calculation (which removed the "built-in conservatism within the Reference 4 calculation) determined that, when ignoring "random" non-airway type of military flight, the total probability of an aircraft crash resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is equal to 5.79×10^{-8} crash/year for the ISFSI. When considering "random" non-airway types of military flight and utilizing the following diameter circles, the number of "random" non-airway military flights that could occur, while still remaining below the SRP level of acceptability of 1.0×10^{-7} per year, are as follows:

- One mile circle — Number = 245/year
- One thousand foot circle — Number = 46/year

Section 3.5.1.6 of the SRP states the following:

> "10 CFR Part 100, Section 100.10 as it relates to indicating that the site location, in conjunction with other considerations (such as plant design, construction, and operation), should insure a low risk of public exposure. This requirement is met if the probability of aircraft accidents resulting in radiological consequences greater than 10 CFR Part 100 exposure guidelines is less than about 10^{-7} per year."

The above noted calculated probability of 5.79×10^{-8} per year along with the above noted number of allowed "random" non-airway type of military flight, meets the above stated criteria of less than about 10^{-7} per year.

From the above discussion it becomes apparent that the probability of an accident may have increased. Though the probability of an accident may have increased, the risk that an aircraft crash would result in an offsite exposure level exceeding 10 CFR Part 100 limits is considered to be below the level of acceptability (i.e., 10^{-7} per year). Since aircraft hazard conditions have changed to the point that, at times, aircraft fly directly overhead versus seven miles from the ISFSI, as was originally described within the ISFSI SAR, it is being conservatively concluded that the probability of an accident has increased (the probability of an aircraft hazard was not previously quantified). Therefore, this activity will be considered to constitute a Unreviewed Safety Question and requires a review from the NRC.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Spacer Disk & Support Rod Material				72.48 Log No.: SE00005
D3-DSC-21; 2/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 6

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 10·20·97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: R. O. Hardies Work Group: ME&IU	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 10/20/97 SIGNATURE / DATE	[signature] 10/21/97 SIGNATURE / DATE	[signature] 10/20/97 SIGNATURE / DATE

Approved Disapproved

Signature: K.C. ANSTEE [signature]
INDEPENDENT REVIEWER

Date 10-22-1997

Approved Disapproved

Signature: [signature] for GS-DES, GS-TES, or PE-PDSU

Date 10·23·97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-126 Date: 11·3·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Spacer Disk & Support Rod Material				72.48 Log No.: SE00005
D3-DSC-21; 2/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 6

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses the material used for the Dry Shielded Canister (DSC) spacer disks and support rods.

Reason for Activity: The NRC SER states that all DSC structural components are fabricated from type 304 stainless steel. The ISFSI USAR also states that all DSC structural components are fabricated from type 304 stainless steel, except the spacer disks and support rods may be fabricated from aluminum coated carbon steel. BGE requested an alternative material for the spacer disks and support rods to reduce fabrication costs. BGE approved this design change for construction in 1991. The ISFSI license was issued in November of 1992, and ISFSI loading operations began in November of 1993. All fifteen fuel loadings to date have been successful, of which seven of the DSCs were constructed with aluminum coated carbon steel spacer disks and support rods. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Special Note: This proposed activity was presented as a 10 CFR 72.48 safety evaluation to the Plant Operations and Safety Review Committee (POSRC) on April 6, 1992, Meeting No. 92-035. POSRC reviewed and recommended approval of the safety evaluation to the Plant General Manager, who subsequently approved the safety evaluation. Since this safety evaluation was approved prior to the issuance of the ISFSI 10 CFR 72.48 license, the change was incorporated in the first revision of the original SAR. As stated above, this safety evaluation was performed even though the change was incorporated into the ISFSI USAR. Seven of the fifteen DSC's loaded to date have aluminum coated carbon steel spacer disks and support rods.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are three major components of the NUHOMS-24P system that are addressed in this safety evaluation. Those three components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); and 3) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those three components.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and act as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Spacer Disk & Support Rod Material			72.48 Log No.: SE00005	
D3-DSC-21; 2/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 6

Function(s) of affected SSC (con't):

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.4, 3.6, 4.2, 5.1, 7.4, 8.1, and 8.2.

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the USAR allowing the DSC spacer disks and support rods to be fabricated from type 304 stainless steel or aluminum coated carbon steel. The NRC SER currently states that all DSC structural components are fabricated from type 304 stainless steel. BGE requested the aluminum coated carbon steel as an alternative material for the spacer disks and support rods to reduce fabrication costs back in 1991 (The resultant savings per DSC was $10,500). The alternative material was evaluated by Pacific Nuclear Fuel Services in 1991 via vendor calculation no. BGE001.0216 (Carbon Steel DSC Basket Assembly) and concluded that it was structurally acceptable, and that the previous DSC structural vendor calculation no. BGE001.0203 (DSC Structural Analysis) was still valid. The calculation evaluated the DSC for allowable stresses, ductility, and corrosion resistance. The strength of carbon steel for structural support of the stored spent fuel exceeds that of the stainless steel.

The DSC basket assembly is constructed to ASME Boiler & Pressure Vessel Code, Division 1, Section NF (Component Supports). The original DSC's use stainless steel components (ASME SA-240, type 304). The newer DSC's have carbon steel support rods (ASME SA-696, Gr. B) and carbon steel spacer disks (ASME SA-516, Gr. 70).

As stated earlier, seven of the fifteen DSC's loaded to date have aluminum coated carbon steel spacer disks and support rods. All fifteen fuel moves to date have resulted in a smooth transfer of the DSC to the HSM.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the USAR allowing the DSC spacer disks and support rods to be fabricated from type 304 stainless steel or aluminum coated carbon steel. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Spacer Disk & Support Rod Material				72.48 Log No.: SE00005
D3-DSC-21; 2/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 6

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this proposed activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. Since the accident analysis was performed after the 1991 design change, it included the use of either type 304 stainless steel or aluminum coated carbon steel spacer disks and support rods. The USAR states that an actual drop event is not credible. The accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the use of either material was considered in the analysis, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. One possible malfunction of the DSC which is not described or evaluated in the USAR is the corrosion of the DSC carbon steel spacer disks and support rods due to exposure to spent fuel pool environment of borated water. The material corrosion properties are only relevant during transfer of fuel to the DSC in the spent fuel pool since the storage atmosphere is made inert with Helium and there is no oxygen present to support corrosion of the carbon steel spacer disks and support rods. To prevent any possible corrosion, cathodic protection was provided to all exposed carbon steel surfaces with a minimum 0.003 inches of flame sprayed aluminum coating. This not only protects the carbon steel during fuel loading, but also provides an additional corrosion barrier during long term storage. Aluminum corrosion rates in PWR water have been reported for immersed 3000 ppm boron water environment. These rates are insignificant, however, in that the Calvert Cliffs DSC's, under normal loading conditions, are exposed to the borated water for less than 48 hours. In addition, tests by Vectra Technologies concluded that no precipitates or corrosion products were visible in the test water and the water appeared clear. Chemical analysis of the water verified that aluminum released was less than 1 ppm. Therefore, the 0.003 inches of flame sprayed aluminum coating will remain in place and corrosion of the carbon steel will not take place.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. One accident scenario not described in the USAR is a chemical, galvanic, or other reaction in the DSC that could cause an ignition event. This relates to NRC Bulletin 96-04: Chemical, Galvanic, or Other Reactions in Spent Fuel Storage and Transportation Casks. This bulletin was the result of a hydrogen gas ignition event that occurred during the welding of the shield lid on a spent fuel storage cask at Wisconsin Electric Power Company's Point Beach Nuclear Plant on May 28, 1996. At Point Beach, an investigation concluded that the event occurred as a result of interaction between the borated spent fuel pool water and the zinc paint that coated the interior of the carbon steel canister inside the cask. The source of the hydrogen was the oxidation of zinc when it came in contact with the borated water.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Spacer Disk & Support Rod Material			72.48 Log No.: SE00005	
D3-DSC-21; 2/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 6

The Calvert Cliffs DSC's are constructed entirely of type 304 stainless steel, except the spacer disks and support rods are fabricated from type 304 stainless steel or aluminum coated carbon steel. The BGE response to the bulletin addressed the flame sprayed aluminum coating on the carbon steel spacer disks and support rods, and the precautionary measures adopted by Calvert Cliffs. The next few paragraphs address the Calvert Cliffs response to NRC Bulletin 96-04 and the precautionary measures. The NRC acknowledged in an April 8, 1997 letter to Mr. C. H. Cruse, that it did not have a safety issue at that time regarding the NUHOMS-24P system.

It is well known that aluminum coatings on carbon steel react in aqueous media due to a combination of the galvanic corrosion and general corrosion methods. Since the aluminum coating is less noble than the carbon steel to which it is bonded, it will be subject to galvanic corrosion and function like a sacrificial coating. The contribution of radiolysis to the build-up of hydrogen in the DSC air space is minor compared to the contribution from corrosion. When hydrogen is generated by the simultaneous reaction of radiolysis and corrosion within the same water inventory, the combined generation of hydrogen will be suppressed due to competition for reaction products. Three sources of information were available to determine hydrogen generation for the Calvert Cliffs DSC's. They were laboratory testing, Duke Power measurements at Oconee, and computer simulation. For normal loading operations, the total elapsed time from the placement of the DSC top shield plug to the point at which the DSC cover plate is completely welded in place is expected to be less than 24 hours at temperatures ranging from about 70°F to 120°F. It was concluded that corrosion, coupled with radiolysis analysis results, indicate that the maximum hydrogen concentration is predicted to be 1.82%, which is less than half of the lower flammability limit of 4% hydrogen in air. Vectra Technologies has recommended that hydrogen monitoring should be performed with an alarm setpoint of 2.4%.

Based on the above, precautionary measures were adopted by Calvert Cliffs and incorporated into two procedures, ISFSI-01, "ISFSI Loading," and ISFSI-02, "ISFSI Unloading." The following steps have been added as a precautionary measure during ISFSI loading and unloading operations:

1) The DSC cavity will always be vented prior to welding of the inner lid during the loading operation, and prior to removing the inner lid during the unloading operation.
2) For operations involving DSC containing carbon steel coated with flame-sprayed aluminum, sampling for flammable gases will be performed. During ISFSI loading operation (ISFSI-01), sampling for flammable gases will be performed before any welding of the inner lid is complete and passes the dye penetrate test. If at any time the measured concentration of flammable gases inside the DSC rises above 50% of the flammability limit (which equates to an alarm setpoint of 2%), welding will stop and a purge of the DSC air space will begin. During the unloading operation (ISFSI-02), a continuous sampling of the DSC cavity will be performed while removing the inner lid. As in the case of the loading operation, if the measured concentration of flammable gases inside the DSC rises above 50% of the flammability limit (which equates to an alarm setpoint of 2%), the inner lid removal process will be stopped, and the DSC air space will be purged.

In summary, the possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Spacer Disk & Support Rod Material				72.48 Log No.: SE00005
D3-DSC-21; 2/129;	ES199601368	Supplement 001	Revision 0000	Page 6 of 6

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The design change provided an alternative material for the spacer disks and support rods to reduce fabrication costs. BGE approved this design change for construction in 1991. The change in material does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses the material used for the Dry Shielded Canister (DSC) spacer disks and support rods.

Reason for Activity: The NRC SER states that all DSC structural components are fabricated from type 304 stainless steel. The ISFSI USAR also states that all DSC structural components are fabricated from type 304 stainless steel, except the spacer disks and support rods may be fabricated from aluminum coated carbon steel. BGE requested an alternative material for the spacer disks and support rods to reduce fabrication costs. BGE approved this design change for construction in 1991. The ISFSI license was issued in November of 1992, and ISFSI loading operations began in November of 1993. All fifteen fuel loadings to date have been successful, of which seven of the DSCs were constructed with aluminum coated carbon steel spacer disks and support rods. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Special Note: This proposed activity was presented as a 10 CFR 72.48 safety evaluation to the Plant Operations and Safety Review Committee (POSRC) on April 6, 1992, Meeting No. 92-035. POSRC reviewed and recommended approval of the safety evaluation to the Plant General Manager, who subsequently approved the safety evaluation. Since this safety evaluation was approved prior to the issuance of the ISFSI 10 CFR 72.48 license, the change was incorporated in the first revision of the original SAR. As stated above, this safety evaluation was performed even though the change was incorporated into the ISFSI USAR. Seven of the fifteen DSC's loaded to date have aluminum coated carbon steel spacer disks and support rods.

Activity Summary: After a thorough and intense review, it has been concluded that the proposed activity:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Annulus Fill Water				72.48 Log No.: SE00006
A-DSC-2; 3/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
11/12/97 SIGNATURE / DATE	11/10/97 SIGNATURE / DATE	11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: M.A. Wright
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature:
for ~~GS-DES~~, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: ______ Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: ______ Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: ______ Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Annulus Fill Water				72.48 Log No.: SE00006
A-DSC-2; 3/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses the fill water for the DSC-TC annulus.

Reason for Activity: The SER states in one section that the Dry Shielded Canister (DSC)-Transfer Cask (TC) annulus is filled with borated water, and in another section states it is filled with demineralized water. The USAR states that the DSC-TC annulus is filled with demineralized water.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 4.2, 4.3, 4.4, 5.1, 7.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Annulus Fill Water				72.48 Log No.: SE00006
A-DSC-2; 3/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the USAR allowing the annulus between the DSC and cask to be filled with demineralized water and sealed with an inflatable seal. The purpose of this design has been to prevent contamination of the DSC outer surface by the spent fuel pool water.

The NRC SER states in Section 1.5.5 that the DSC-TC annulus is filled with borated water rather than demineralized water. However, Table 1-2, states in part that the water in the TC-DSC annulus is demineralized. The use of demineralized water is consistent with the manufacturer design as detailed in the NUHOMS-24P Topical Report, Section 5.1, Operation Description, which describes filling of the DSC-TC annulus with clean, demineralized water. The annulus between the DSC and cask is filled with demineralized water and sealed with an inflatable seal to prevent contamination of the DSC outer surface by the spent fuel pool water. Dry shielded canister loading procedures require that the annulus between the transfer cask and DSC be filled with demineralized water and sealed prior to immersion in the spent fuel pool.

This Safety Evaluation clarifies an existing condition and does not change the original design or operation of the DSC-TC annulus. This clarification has no detrimental impact on equipment important to safety. Therefore, this clarification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the loading operation of the DSC while in the Spent Fuel Pool.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Annulus Fill Water			72.48 Log No.: SE00006	
A-DSC-2; 3/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The use of demineralized water is consistent with the manufacturer design as detailed in the NUHOMS-24P Topical Report, Section 5.1, Operation Description, which describes filling of the DSC-TC annulus with clean, demineralized water. The annulus between the DSC and cask is filled with demineralized water and sealed with an inflatable seal to prevent contamination of the DSC outer surface by the spent fuel pool water. Dry shielded canister loading procedures require that the annulus between the transfer cask and DSC be filled with demineralized water and sealed prior to immersion in the spent fuel pool.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
3/4.2.3	This Technical Specification addresses the maximum allowable DSC Exterior Surface Contamination limits. The USAR requires filling the DSC-TC annulus with demineralized water, placing a mechanical seal over the annulus, and utilizing procedures which require examination of the annulus surfaces for smearable contamination. Therefore, there is no possibility of significant radionuclide release from the DSC exterior surface during transfer or storage.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. During transfer of the sealed DSC and subsequent storage in the HSM, the only postulated mechanism for the release of airborne radioactive material is the dispersion of non-fixed surface contamination on the DSC exterior. By filling the cask/DSC annulus with demineralized water, placing a mechanical seal over the annulus, and utilizing procedures which require examination of the annulus surfaces for smearable contamination, the contamination limits on the DSC can be kept below the permissible level for storage or transfer of fuel. Therefore, there is no possibility of significant radionuclide release from the DSC exterior surface during transfer or storage.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Annulus Fill Water				**72.48 Log No.: SE00006**
A-DSC-2; 3/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 5 of 5**

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses the fill water for the DSC-TC annulus.

Reason for Activity: The SER states in one section that the Dry Shielded Canister (DSC)-Transfer Cask (TC) annulus is filled with borated water, and in another section states it is filled with demineralized water. The USAR states that the DSC-TC annulus is filled with demineralized water.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Helium Leak Test Seal Welds				72.48 Log No: SE00007
A-DSC-3; 4/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 10/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. WRIGHT
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: [signature] for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Helium Leak Test Seal Welds				72.48 Log No: SE00007
A-DSC-3; 4/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses when the helium leak test is performed on the seal welds for the DSC.

Reason for Activity: The NRC SER states to weld the DSC shield plug and then helium leak test the seal welds. This differs from the ISFSI USAR where the helium leak test is not performed at this point in the loading process.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 4.3, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Helium Leak Test Seal Welds			72.48 Log No: SE00007	
A-DSC-3; 4/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of performing the sequence for helium leak testing of the seal welds.

The NRC SER states in Section 1.5.5 to weld the DSC shield plug and then helium leak test the seal welds. However, BGE performs the following steps as detailed in the ISFSI USAR: 1) Seal weld top shield plug to DSC; 2) Perform NDE on seal weld; 3) Drain remaining water from DSC; 4) Vacuum dry DSC; 5) Backfill DSC with helium; 6) Perform helium leak test. Dye penetrant testing is performed upon completion of the seal weld. The reasoning behind this is to ensure the weld is in compliance with the BGE Weld Program, as it provides the primary closure for the DSC. In addition, the helium leak test would not be performed without the DSC vacuum dried. This order of operations is consistent with the manufacturer design as detailed in the NUHOMS-24P Topical Report, Section 5.1, Operation Description, which describes the performance of dye penetrant weld examination of the seal weld just after the weld is created.

This Safety Evaluation clarifies an existing condition and does not change the original design or operation of the DSC. This clarification has no detrimental impact on equipment important to safety. Therefore, this clarification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the helium leak testing of the seal welds.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Helium Leak Test Seal Welds				72.48 Log No: SE00007
A-DSC-3; 4/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. BGE performs the following steps as detailed in the ISFSI USAR: 1) Seal weld top shield plug to DSC; 2) Perform NDE on seal weld; 3) Drain remaining water from DSC; 4) Vacuum dry DSC; 5) Backfill DSC with helium; 6) Perform helium leak test. Dye penetrant testing is performed upon completion of the seal weld. The reasoning behind this is to ensure the weld is in compliance with the BGE Weld Program, as it provides the primary closure for the DSC. In addition, the helium leak test would not be performed without the DSC vacuum dried. This order of operations is consistent with the manufacturer design as detailed in the NUHOMS-24P Topical Report, Section 5.1, Operation Description, which describes the performance of dye penetrant weld examination of the seal weld just after the weld is created.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
3/4.2.2	This technical specification addresses the minimum allowable leak tightness for DSC closure welds. To ensure compliance with this technical specification, the USAR specifies a certain sequence of events including the performance of NDE on the DSC seal welds prior to performance of helium leak testing. This order of operations is consistent with the manufacturer design as detailed in the NUHOMS-24P Topical Report, Section 5.1, Operation Description, which describes the performance of dye penetrant weld examination of the seal weld just after the weld is created. As such, the margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this activity. This activity responds to one identified difference between the NRC SER and the BGE ISFSI USAR. This activity clarifies an existing condition and does not change the original design or operation of the DSC. The clarification of the subject difference does not change any DSC component or function that would or could potentially increase occupational dose.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Helium Leak Test Seal Welds			72.48 Log No: SE00007	
A-DSC-3; 4/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses when the helium leak test is performed on the seal welds for the DSC.

Reason for Activity: The NRC SER states to weld the DSC shield plug and then helium leak test the seal welds. This differs from the ISFSI USAR where the helium leak test is not performed at this point in the loading process.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

SAFETY EVALUATION FORM

ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008

ISFSI – Proof Pressure Testing of DSCs

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

☐ YES	☒ NO	Involve an unreviewed safety question (USQ)?
☐ YES	☒ NO	Involve a change in the Technical Specifications/License Conditions?
☒ YES	☐ NO	Require a change or addition to the UFSAR/USAR/Technical Specification Bases?

Applicable to 10 CFR 72.48 Safety Evaluations

☐ YES	☒ NO	Involve a Significant Increase in Occupational Dose?
☐ YES	☒ NO	Involve a Significant Unreviewed Environmental Impact?

Prepared by: B. H. Scott / M. Kaiseruddin
PRINTED NAME AND SIGNATURE
Department: DES-~~C~~MEU / Sargent & Lundy
Date: 02/28/01 02/28/01

☒ YES ☐ NO Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye	Resp. Ind.: R. H. Beall	Resp. Ind.:
PRINTED NAME	PRINTED NAME	PRINTED NAME
SIGNATURE	SIGNATURE	SIGNATURE
Work Group: Licensing	Work Group: NFM	Work Group:
Date: 03/27/01	Date: 3/27/01	Date:

Approved ☒ Disapproved ☐	Approved ☒ Disapproved ☐
Signature (J. E. Remeniuk) INDEPENDENT REVIEWER	Signature P. D. PATEL GS-DES, GS-TSES, or PE-PDSU
Date 4.9.01	Date 4/10/01

The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 01-028 Date: 4/11/01

Recommend Approval ☑ Recommend Disapproval ☐ Signature POSRC CHAIRMAN Date 4/11/01

Approved ☑ Disapproved ☐ Signature PLANT GENERAL MANAGER Date 4/11/01

The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? ☐ YES ☒ NO
Signature: OSSRC SES Chairman Date: 7/12/01

If yes, OSSRC Meeting No. ________

ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008

ISFSI – Proof Pressure Testing of DSCs

Proposed Activity:

The proposed activity consists of making changes to the ISFSI USAR [Refs. 1 and 2]. The changes are being made to incorporate a description of the alternate way of leak testing that was performed on the first ten DSCs that were put in service. The DSCs impacted by this activity are BGE24P-R002, -R007, and -R010 through -R017.

The proposed activity does not involve any hardware change.

The USAR change consists of inserting a new paragraph in Section 3.3.2.1, as shown in Reference 2.

Background

The Independent Spent Fuel Storage Installation (ISFSI) at the Calvert Cliffs Nuclear Power Plant (CCNPP) utilizes the Nutech Horizontal Modular Storage (NUHOMS)-24P dry storage system. The system consists of concrete horizontal storage modules (HSMs), which provide passive storage for spent fuel assemblies that are placed within Dry Storage Canisters (DSCs). Twenty-four spent fuel assemblies are loaded into each DSC. Each DSC contains an outer leak-tight shell and an internal basket assembly. The outer shell provides the structural strength, shielding, and a leak-tight chamber for containing helium. The helium provides an inert atmosphere within the DSC.

The DSC shell is fabricated out of metal plate in a welded construction. Cylindrical portion of the shell contains girth and longitudinal welds. The bottom cover is welded to the shell near the bottom of the DSC. There is a circumferential weld near the top, which is made in the field after loading the fuel.

The NRC issued a Confirmatory Action Letter (CAL) [Ref. 6] to the DSC supplier, Vectra Technologies, in part to document the concern that leak testing was performed on DSCs in lieu of pressure testing in accordance with ASME B&PV Code, Section III, NB-6000. Vectra responded to the CAL, and committed to performing the pressure testing on DSCs, with the exception of those that were already loaded with spent fuel [Ref. 7]. Based on Vectra's response the NRC closed the CAL, with the clarification that "all in-service canisters should remain in service 'as is' without a NB-6000 proof-pressure test" [Ref. 8]. It is noted here that the DSCs impacted by this activity were loaded with fuel prior to issuance of the CAL.

This activity describes the approach CCNPP is taking to resolve the concern related to the lack of pressure testing for the ten in-service DSCs at CCNPP.

Analyses / Justifications

NRC's Safety Evaluation Report (SER) [Ref. 4] states about DSC leak testing that:

- The leak test performed during fabrication be a proof pressure tests in accordance with NB-6000,
- The leak test performed at the plant for assuring a gas tight seal for the top welds be helium leak detection which is very sensitive, and
- The leak test performed during fabrication for the bottom welds be a soap bubble film test per ANSI N14.5-1987.

ISFSI Tech Spec 3.2.2.2 also requires that the top weld be tested by the helium leak rate method. The Calvert Cliffs ISFSI License, Condition 16, seems to imply that the bottom weld shall also be tested by the helium leak test, which is in contradiction with the statement in the SER. A license amendment request has been submitted to the NRC to revise License Condition 16 so as to remove the discrepancy [Ref. 9].

ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008

ISFSI – Proof Pressure Testing of DSCs

The leak test requirements are essentially the same for NUHOMS general license. Vectra Technologies has summarized the requirements as follows [Ref. 7]:

- The NRC does not expect a NB-6000 proof pressure test of the DSC top and bottom closure welds either in the fabrication shop or in the field. (Per the CCNPP ISFSI SER and Tech Specs, a helium leak rate test is required for the top weld, and a soap bubble film test is required for the bottom welds.)
- The NRC does expect a NB-6000 proof pressure test of DSC shell hoop and longitudinal welds.

Vectra Technologies, in their response to the CAL [Ref. 7], covered not only the "general license" canisters but also others governed by 10 CFR 72 site licenses, such as those in use at CCNPP. This fact was acknowledged by the NRC in the attachment to their letter of 2/15/97 [Ref. 8]. Vectra argued that NB-6000 proof-pressure test for the in-service canisters was not necessary to demonstrate DSC's containment capability based on the following facts:

- The joining plates were sound.
- The weldments were sound because they used qualified materials, procedures, and welders. Also, the welds were made by a multi-pass process which effectively eliminated pin-hole leaks that might occur in a single-pass process.
- The shell material was very forgiving.
- The weldments were both surface and volumetrically examined (liquid penetrant test (PT) and radiograph test (RT)).
- The weldments were leak tested per ANSI N14.5.
- The pressure loading in a DSC was very low (unlike traditional pressure vessels, mechanical loads govern the DSC shell stresses, not the internal pressure).

The leak testing performed on the in-service DSCs was as follows: The bottom weld and the girth and longitudinal welds were tested by the soap bubble film test, and the top weld was tested by the helium leak test. Therefore the only welds not tested per the CCNPP ISFSI SER are the girth and longitudinal welds. CCNPP subsequently tested over 26 DSCs per NB-6000 with no canister failing the test [Refs. 9 and 10]. The fuel assemblies themselves were also tested before being loaded into the DSCs to ensure that there were no cladding failures [Ref. 11].

Vectra concluded that NB-6000 proof-pressure testing of the in-service DSCs was not practical, and that they should be accepted "as is". The NRC agreed with Vectra's conclusion [Ref. 8], and explained their reason for the agreement as follows. "The objective of the NB-6000 test is to demonstrate DSC's structural capability to maintain containment pressure boundary. Compared to the mechanical loads, such as cask impact, that govern the sizing of the DSC shell plate thickness and design of fabrication details to ensure adequate performance, the design internal pressure as a basis for an NB-6000 pressure test will generate a stress condition far less severe than is intended to demonstrate DSC's structural capability."

The facts provided by Vectra and the reason for acceptance provided by the NRC, as listed above, are true and applicable to the DSCs in use at CCNPP. Therefore, the in-service DSCs at the CCNPP are acceptable "as is".

Reason for Activity:

The activity is being performed partly to help close out the Issue Report IR0-037-091 [Ref. 3]. Proof pressure testing of the DSC girth and longitudinal welds was not done per the CCNPP ISFSI SER, to demonstrate the leak tightness. Leak tightness of the DSC is required to assure that the helium from the

ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008

ISFSI – Proof Pressure Testing of DSCs

DSC does not completely leak out over the storage period, which could otherwise expose the fuel cladding to potentially corrosive environment.

Function(s) of affected SSCs:

The affected SSCs are the DSCs.

The DSC is classified as important-to-safety per 10 CFR 72. It consists of an outer canister and an internal basket assembly. The sub-components of the internal basket assembly include the Spacer Discs, Support Rods, and Guide Sleeves. The internal basket assembly components are not attached structurally to the outer canister.

The DSC provides containment, shielding, criticality control, configuration control related to fuel retrievability, structural support, and thermal safety functions during loading operations, transfer operations, and storage. It is designed to remain intact under all accident conditions identified in the ISFSI USAR with no loss of function. Specific design functions of the DSC include the following:

1. Confinement - The DSC design provides mechanical confinement of the stored fuel assemblies to prevent the dispersion of particulate or gaseous radionuclides from the fuel. The primary function of the DSC is to provide confinement of the spent nuclear fuel. This is achieved by the stainless steel shell and two inner cover plates (top and bottom ends) which are welded to the shell assembly. There are also outer cover plates (top and bottom) to further assure containment integrity. The DSC confinement boundary is designed also to retain helium cover gas around the fuel in order to prevent corrosion of the fuel cladding and formation of expansive oxides in the fuel during storage.

2. Criticality Control - The DSC design provides for sub-criticality during the wet loading, DSC drying, and interim storage operations. This is accomplished by a combination of mechanical separation of the fuel assemblies by the internal basket assembly and neutron absorption in the steel guide sleeve material.

3. Fuel Support and Configuration Control - The DSC internal basket assembly provides support for the spent fuel assemblies during normal operations. The DSC also provides configuration control related to post accident recovery of spent nuclear fuel. The DSC is designed so that the worst-case postulated accidents, including a cask drop, will not result in deformation of the Internal Basket Assembly or the DSC shell to such a degree that retrieval of intact fuel assemblies is not assured.

4. Shielding - The DSC materials provide gamma radiation shielding. The DSC provides gamma shielding at its ends by the use of lead shield plugs. These provide ALARA dose rates at the top of the canister during drying and sealing operations and at the bottom for minimizing dose rates during DSC loading into the Horizontal Storage Module (HSM) and at the HSM door during storage.

5. Thermal - Decay heat is removed by thermal radiation and conduction from the DSC to the TC, and by thermal radiation and conduction and convection from the DSC to the HSM. The DSC maintains the helium cover gas, which is required for corrosion control. This cover gas improves the thermal performance of the DSC.

The functions of the internal basket assembly components are as follows:

6. Guide Sleeves – The guide sleeves establish storage compartments for 24 spent fuel assemblies within the DSC. The tops of the guide sleeves are flared to assist fuel-handling operators in guiding the spent fuel assemblies into the sleeves.

7. Spacer Discs – The spacer discs work together with the guide sleeves to maintain geometric separation of the fuel assemblies. The spacer discs support the weight of the guide sleeves, support rods and the spent nuclear fuel when the DSC is in a horizontal orientation.

ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008

ISFSI – Proof Pressure Testing of DSCs

8. Support Rods – The support rods maintain the spacer disk locations along the length of the DSC. They carry the weight of the guide sleeves and the spacer discs when the DSC is in a vertical orientation.

ISFSI USAR Revision No.: 9

ISFSI USAR Sections Reviewed:

The main chapters reviewed were 3, 4, 5, 7, and 8. The key Sections reviewed are listed as follows:

3.3.2 Protection by Multiple Confinement Barriers and Systems
4.2.1.2 Dry Shielded Canister (Structural Specifications)
4.2.3.2 Dry Shielded Canister Description
5.1.1.2 Fuel Loading
8.1.1.2 Dry Shielded Canister Analysis
8.1.1.3 Dry Shielded Canister Internal Basket Analysis
8.2.3.2 Accident Analysis
8.2.5 Cask Drop

Table 3.6-3 Summary of Design Criteria for Accident Conditions
Table 8.2-1 NUHOMS-24P Accident Loading Identification
Table 8.2-6 Maximum Dry Shielded Canister Stresses for Drop Accident Loads

Tech Spec Bases Amendment/Rev No.: 2

Calvert Cliffs Independent Spent Fuel Storage Installation Technical Specifications, Appendix A to Materials License No. SNM-2505, Amendment 2, June 30, 2000

Tech Spec Bases Reviewed:

3/4.2.2 DSC Closure Welds

CCNPP ISFSI SER
Section 2.2.3.2

ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008

ISFSI – Proof Pressure Testing of DSCs

Complete for 50.59 and 72.48:

1. **The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.**

☐ YES ☒ NO **May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?**

Probability of Malfunction:

The proposed activity consists of making a change to the ISFSI USAR. The change is being made to incorporate a description of the leak testing which was performed on the first ten DSCs that were put into service. The type of leak testing that was performed was different from that stated by the NRC in the SER, which was the ASME B&PV Code, Section III, NB-6000 pressure test. However, the NRC accepted the in-service DSCs "as-is", and provided their reason for the acceptance as follows. "The objective of the NB-6000 test is to demonstrate DSC's structural capability to maintain containment pressure boundary. Compared to the mechanical loads, such as cask impact, that govern the sizing of the DSC shell plate thickness and design of fabrication details to ensure adequate performance, the design internal pressure as a basis for an NB-6000 pressure test will generate a stress condition far less severe than is intended to demonstrate DSC's structural capability."

The proposed activity does not involve any hardware changes.

Therefore, the probability of malfunction of equipment important to safety will not be increased because of the proposed changes.

☐ YES ☒ NO **May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?**

Consequences of Malfunction:

The malfunctions to be considered are those of the ISFSI important-to-safety components that are impacted by this activity, namely the DSCs.

The consequences of failure of the DSC are all related to the release of radioactivity into the atmosphere or the dose to operators or the public. The shielding and containment properties of the DSC are not compromised. For the NUHOMS-24P system, the NRC has accepted the use of in-service DSCs "as is", without requiring additional pressure testing. Therefore, the consequences of failure of the DSC will not be impacted by this activity.

☐ YES ☒ NO **May the probability of occurrence of an accident previously evaluated in the SAR be increased?**

Probability of Accident:

Credible accidents analyzed for the Calvert Cliffs ISFSI are discussed in Section 8.2 of the SAR. They consist of loss of shielding, external missiles, earthquake, flood, cask drop, lightning, blockage of air inlets and outlets, DSC leakage, DSC overpressurization, and forest fire.

There is no change to the design or operation of the NUHOMS system caused by this activity. This activity does not modify the external configuration of the DSC envelope. The interface between the DSC and the HSM during ISFSI operations and interim storage of the DSC remains unaffected. Therefore, the probability of occurrence of an accident involving loss of HSM air outlet shielding, or blockage of HSM air inlets and outlets will not increase.

Pressurization of the DSC due to fuel cladding failure is an accident scenario identified in USAR Section 8.2.9. The limiting DSC pressurization accident event is a rupture of fuel cladding together with blockage of the HSM vents. This activity does not compromise the fuel cladding, or the fuel rod integrity, to cause an increase in the probability of this accident.

DSC leakage is an accident scenario described in USAR Section 8.2.8. The USAR indicates that there are no credible events that would initiate this type of accident. As stated in the preceding paragraphs, the probability of an accident that would lead to cladding failure is not increased by this activity. This activity does not affect the design of the DSC pressure boundary. In fact, the USAR accident assumes that the fission products are released directly to the atmosphere instantaneously, which is a far greater leak rate than the one demonstrated through DSC leak testing. Therefore, the probability of DSC leakage is not increased.

☐ YES ☒ NO **May the consequences of an accident previously evaluated in the SAR be increased?**

Consequences of Accident:

The proposed activity consists of the USAR changes related to leak testing of the first ten DSCs that were loaded with the spent fuel.

The consequences of the cask drop accident on the DSC are described in the USAR. The accident does not lead to cladding rupture, or increased leakage of the fission products from the fuel.

The DSC leakage accident also would not result in any higher release of radioactivity, because the USAR accident assumes that the fission products are released directly to the atmosphere instantaneously, which is a far greater leak rate than the one demonstrated through DSC leak testing.

Therefore, consequences of an accident previously evaluated in the SAR will not be increased.

2. **The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.**

☐ YES ☒ NO **May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?**

Possibility of New Malfunction:

The proposed activity makes changes to the USAR related to leak testing of the first ten DSCs. None of the changes impact the environment, functioning, or the procedures related to the equipment important to safety. DSC leakage has been considered, therefore, there is no possibility created of a new malfunction in any of the important-to-safety ISFSI components.

ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008

ISFSI – Proof Pressure Testing of DSCs

☐ YES ☒ NO **May the possibility of an accident of a different type than any previously evaluated in the SAR be created?**

Possibility of New Accident:

Credible accidents analyzed for the Calvert Cliffs ISFSI are discussed in Section 8.2 of the USAR, and have been discussed previously. Evaluation of the proposed changes to the USAR showed that the important-to-safety components of ISFSI would maintain their safety functions. Since there is no change to the design or operation of the NUHOMS system caused by this activity, the possibility of an accident of a different type than any previously evaluated in the SAR would not be created.

Complete for 50.59 and 72.48:

3. **The margin of safety as defined in the basis for any Technical Specification is not reduced.**

☐ YES ☒ NO **Will the margin of safety as defined in the basis for any Technical Specification be reduced?**

Tech Spec Bases: **3.2.2**

Discussion of why the margin of safety is not reduced:

The margin of safety is defined as the range of values between the acceptance limit reviewed and approved by the NRC as part of the licensing basis and the failure point [Ref. 17]. USAR Sections 3.2.5 and 3.3.2 define the acceptance criteria for ISFSI components, none of which would be exceeded. Therefore, the margin of safety would not be reduced.

Complete for 72.48:

☐ YES ☒ NO **Will the proposed activity involve a significant increase in occupational dose?**

A significant increase in occupational dose:

The radiation protection design and operation of the NUHOMS-24P dry cask storage system would not be changed by this proposed activity. The DSC would maintain the radioactivity confinement boundary. Because none of these attributes would be changed, the occupational doses summarized in USAR Table 7.4-1 would not be affected by this activity.

☐ YES ☒ NO **Will the proposed activity involve a significant unreviewed environmental impact?**

A significant unreviewed environmental impact:

The NUHOMS-24P dry cask storage system confinement and radiological shielding functions would not be reduced by this activity.

This activity would not affect any area of the plant site previously undisturbed for the ISFSI, and would not cause any reason for revision to the ISFSI Updated Environmental Report. This activity would not affect the environmental conditions associated with the ISFSI. Therefore, this activity would not involve an unreviewed environmental impact.

ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008

ISFSI – Proof Pressure Testing of DSCs

References:

1. Calvert Cliffs Independent Spent Fuel Storage Installation USAR, Rev. 9
2. CCNPP ISFSI USAR Change Request, UCR-00219
3. CCNPP Issue Report No. IR0-037-091, 8/27/95
4. Safety Evaluation Report (SER) for Baltimore Gas and Electric Company's Safety Analysis Report for an Independent Spent Fuel Storage Installation at Calvert Cliffs, November 1992
5. Technical Specifications for Calvert Cliffs ISFSI, Amendment 2
6. Nuclear Regulatory Commission's Confirmatory Action Letter Issued to Vectra Technologies, Inc., 7/7/1995
7. Vectra Technologies' Letter to the NRC, No. VF-95-047, Vectra Supplemental Response to Confirmatory Action Letter, 9/22/1995
8. NRC's Letter to Vectra Technologies, Clarification of Item 3 of Confirmatory Action Letter Dated July 7, 1995, 2/25/1997
9. BG&E Letter from Bruce Tracey to R. A. Ayers of Vectra Technologies, Quality Assurance Surveillance of Vectra Technologies, Inc. Fuel Services, July 23, 1996
10. BG&E Letter from Bruce Tracey to R. A. Ayers of Vectra Technologies, Quality Assurance Surveillance of Vectra Technologies, Inc. Fuel Services (NTE), August 26, 1996
11. Siemens Nuclear Power Reports EMF-92-146(P), Rev. 0, and EMF-94-136(P)
12. CCNPP Letter the NRC, License Amendment Request: Revision to License Conditions 9,12, and 16, November 16, 2000
13. ASME Boiler and Pressure Vessel Code, Section III, Subsection NB, 1983
14. RANOR, Inc., Procedure P-LTP-1, Rev. 0, Leak Testing Procedure, 1/22/91
15. Topical Report for the NUTECH Horizontal Modular Storage (NUHOMS) System for Irradiated Nuclear Fuel, NUH-002, Rev. 2
16. Calvert Cliffs Updated Final Safety Analysis Report (UFSAR), Rev. 26
17. NEI 96-07, Rev. 0, Guidelines for 10 CFR 50.59 Safety Evaluations, 09/97
18. Calvert Cliffs ISFSI Updated Environmental Report, Rev. 1

SAFETY EVALUATION FORM

ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008

ISFSI – Proof Pressure Testing of DSCs

Summary: (For NRC Report, provide a brief overview)

Proposed Activity:

The proposed activity consists of making changes to the ISFSI USAR. The changes are being made to incorporate a description of the alternate way of leak testing which was used for the ten DSCs that were put in service first. The DSCs impacted by this activity are BGE24P-R002, -R007, and -R010 through -R017. The proposed activity does not involve any hardware changes.

Reason for Activity:

Proof pressure testing of the DSC girth and longitudinal welds was not done per ASME B&PV Code, Section III, NB-6000, as stated in the CCNPP ISFSI SER, to demonstrate the leak tightness. Leak tightness of the DSC is required to assure that the helium from the DSC does not completely leak out over the storage period, which could otherwise expose the fuel cladding to potentially corrosive environment.

Activity Summary:

The USAR change being made documents the following. The only welds on the in-service DSCs, which were not pressure-tested per the CCNPP ISFSI SER were the girth and longitudinal welds; instead they were tested by the soap bubble film test. The soap bubble film test performed on those welds measures the air leakage.

Continued use of those DSCs "as is" is justified based on the facts that the plate and weld materials and welding procedures used were sound, weldments were both surface and volumetrically examined, weldments were leak tested per ANSI N14.5, and the pressure loading in a DSC was very low.

CCNPP subsequently tested over 26 DSCs per NB-6000 with no canister failing the test. The fuel assemblies themselves were also tested before being loaded into the DSCs to ensure that there were no cladding failures.

NB-6000 proof-pressure testing of the in-service DSCs is not practical, and based on the above facts, they should be accepted "as is". The NRC agreed with this conclusion for the general license canisters, as well those governed by 10 CFR 72 site-specific licenses, such as those in use at CCNPP, and provided their reason for the agreement as follows. "The objective of the NB-6000 test is to demonstrate DSC's structural capability to maintain containment pressure boundary. Compared to the mechanical loads, such as cask impact, that govern the sizing of the DSC shell plate thickness and design of fabrication details to ensure adequate performance, the design internal pressure as a basis for an NB-6000 pressure test will generate a stress condition far less severe than is intended to demonstrate DSC's structural capability."

USQ Determination: This activity was evaluated against the criteria of 10CFR72.48(a)(2), such as the probability of occurrence or the consequences of an accident or the malfunction of equipment important to safety, and it was concluded that it does not involve an unreviewed safety question (USQ).

ATTACHMENT 3, POSRC/PRC PRESENTATION FORM

POSRC/PRC PRESENTATION FORM

Presentation Date: April 11, 2001

Presenter: Mohammed Kaiseruddin | Extension: 4120

Procedures or Activity:

10CFR72.48 Safety Evaluation, Log No. SE00008, ISFSI – Proof Pressure Testing of DSCs

Purpose of Presentation:

- [x] Recommendation for Approval
- [ ] Information
- [ ] Close OI
- [ ] Extend OI

Activity Summary: (See POSRC/PRC Presenter's Guide III.A.1):

The proposed activity consists of making changes to the ISFSI USAR. The changes are being made to incorporate a description of the alternate method of leak testing which was used for the ten DSCs that were put in service first, instead of ASME Section III, NB-6000 proof pressure-testing as stated in the CCNPP ISFSI SER. The DSCs impacted by this activity are BGE24P-R002, -R007, and -R010 through -R017. The proposed activity does not involve any hardware changes.

Continued use of those DSCs "as is" is justified based on the facts that the plate and weld materials and welding procedures used were sound, weldments were both surface and volumetrically examined, weldments were leak tested per ANSI N14.5, and the pressure loading in a DSC was very low.

CCNPP subsequently tested over 26 DSCs per NB-6000 with no canister failing the test. The fuel assemblies themselves were also tested before being loaded into the DSCs to ensure that there were no cladding failures.

NB-6000 proof-pressure testing of the in-service DSCs is not practical, and based on the above facts, they should be accepted "as is". The NRC concurred with this conclusion for the general license canisters, as well those governed by 10 CFR 72 site-specific licenses such as those in use at CCNPP. The USAR change consists of inserting a new paragraph in Section 3.3.2.1.

Safety Issues Involved: (See POSRC/PRC Presenter's Guide II.B, C, D, E, and III.A.2):

The affected systems, structures and components (SSCs) are DSCs BGE24P-R002, -R007, and -R010 through -R017.

The DSC is classified as important-to-safety per 10 CFR 72. It provides containment, shielding, criticality control, configuration control related to fuel retrievability, structural support, and thermal safety functions during loading operations, transfer operations, and storage. It is designed and tested to assure that it contains helium, thus preserving a non-corrosive environment for fuel cladding.

Recommendations to POSRC or PRC: (See POSRC/PRC Presenter's Guide II.F, G. H, and III.A.3 and F): Recommend approval of this 10CFR72.48 safety evaluation.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Closure Operations				72.48 Log No.: SE00009
A-DSC-8; 6/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. WRIGHT
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Closure Operations				72.48 Log No.: SE00009
A-DSC-8; 6/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This safety evaluation addresses a difference in regard to filling the TC-DSC (Transfer Cask-Dry Shielded Canister) annulus area during transfer DSC closure operations.

Reason for Activity:. The SER identifies the difference in use of water in the TC-DSC (Transfer Cask-Dry Shielded Canister) annulus between the NUHOMS-24P System (Nutech Horizontal Modular Storage) defined in the TR (Topical Report) and the Calvert Cliffs SAR without acknowledging the fact that Calvert Cliffs allows varying the sequence of operations detailed in Chapter 5 of the ISFSI USAR, as long as the limiting conditions for operation are not exceeded.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections Reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.4, 4.2, 4.3, 4.4, 5.1, 7.4, 8.1, and 8.2, including figure 5.1-1, "ISFSI Loading Operations Flowchart.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Closure Operations				72.48 Log No.: SE00009
A-DSC-8; 6/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the USAR varying the sequence of DSC closure operations. The NRC SER states that the water in the DSC/cask annular gap will be drained when the water inside the DSC is drained following completion of the top shield primary seal weld, and that subsequent DSC closure operations will be performed with the DSC cavity and the annular gap dry. The shielding calculations were performed assuming that water would be present in the annular gap when the DSC is flooded, and that the annular gap would be drained when the DSC is drained. The ISFSI USAR provides in Section 5.1.1 a narrative that describes operations unique to the Nutech Horizontal Modular Storage (NUHOMS) systems, such as draining, drying and closure of the dry shielded canister (DSC), in some detail but it is not intended to be limiting or restrictive. Operational procedures may be revised according to the requirements of the plant, provided that the limiting conditions of operation are not exceeded. The justification is that over time, procedures will be revised to incorporate more efficient and/or safer work practices. BGE has written and revised technical procedure ISFSI-01, Independent Spent Fuel Storage Installation (ISFSI) Loading. The procedure requires that demineralized water remain in the annulus through the last closure operation for ALARA purposes. This approach is conservative, in that shielding is provided for as long as possible.

This Safety Evaluation clarifies an existing condition and does not change the original design or operation of the DSC. This clarification has no detrimental impact on equipment important to safety. Therefore, this clarification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the DSC closure operations..

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Closure Operations				72.48 Log No.: SE00009
A-DSC-8; 6/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The ISFSI USAR provides in Section 5.1.1 a narrative that describes operations unique to the Nutech Horizontal Modular Storage (NUHOMS) systems, such as draining, drying and closure of the dry shielded canister (DSC), in some detail but it is not intended to be limiting or restrictive. Operational procedures may be revised according to the requirements of the plant, provided that the limiting conditions of operation are not exceeded. The justification is that over time, procedures will be revised to incorporate more efficient and/or safer work practices. BGE has written and revised technical procedure ISFSI-01, Independent Spent Fuel Storage Installation (ISFSI) Loading. The procedure requires that demineralized water remain in the annulus through the last closure operation for ALARA purposes. This approach is conservative, in that shielding is provided for as long as possible.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
3/4.2.3	This Technical Specification addresses the maximum allowable DSC Exterior Surface Contamination limits. The USAR requires filling the DSC-TC annulus with demineralized water, placing a mechanical seal over the annulus, and utilizing procedures which require examination of the annulus surfaces for smearable contamination. In addition, technical procedure ISFSI-01, Independent Spent Fuel Storage Installation (ISFSI) Loading, requires that demineralized water remain in the annulus through the last closure operation for ALARA purposes. This approach is conservative, in that shielding is provided for as long as possible. Therefore, there is no possibility of significant radionuclide release from the DSC exterior surface during transfer or storage.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this activity. Since technical procedure ISFSI-01, Independent Spent Fuel Storage Installation (ISFSI) Loading, requires that demineralized water remain in the annulus through the last closure operation for ALARA purposes, shielding is provided for as long as possible.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Closure Operations				72.48 Log No.: SE00009
A-DSC-8; 6/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This safety evaluation addresses a difference in regard to filling the TC-DSC (Transfer Cask-Dry Shielded Canister) annulus area during transfer DSC closure operations.

Reason for Activity: The SER identifies the difference in use of water in the TC-DSC (Transfer Cask-Dry Shielded Canister) annulus between the NUHOMS-24P System (Nutech Horizontal Modular Storage) defined in the TR (Topical Report) and the Calvert Cliffs SAR without acknowledging the fact that Calvert Cliffs allows varying the sequence of operations detailed in Chapter 5 of the ISFSI USAR, as long as the limiting conditions for operation are not exceeded.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Corner Weld Design Change				72.48 Log No.: SE00010
D3-DSC-1; 7/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. WRIGHT
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Corner Weld Design Change			72.48 Log No.: SE00010	
D3-DSC-1; 7/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) guide sleeve corner weld.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Corner Weld Design Change				72.48 Log No.: SE00010
D3-DSC-1; 7/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the guide sleeve corner weld design change. The subject guide sleeve corner weld design change meets the weld design requirements as established by Pacific Nuclear Fuel Services (PNFS). This change does not affect any design or licensing requirements. The original weld on the drawing was a full length (100%) fillet weld. The revised weld is an intermittent weld which provides approximately 30% of the length of the original weld. However, because the fuel loads are transmitted directly to the spacer discs, the weld stresses are negligible, and the full length weld was not necessary. Intermittent welding is a common practice for components not subjected to direct loading. The weld symbol on the drawing indicates that the 4" continuous weld is required at both ends. This is to ensure that the free ends are not unwelded. In addition, Note 12 on the drawing (84-002-E) states that the welds shall be ground flush outside and shall not protrude inside the guide sleeve. This is required to protect the fuel assemblies from protruding weld material. Based on this information, the subject design change will not affect the form, fit or function of the DSC guide sleeve, is not detrimental to the structural integrity of the guide sleeve, will not obstruct insertion of the fuel assemblies into the guide sleeves and will not adversely affect the ability of the DSC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the weld design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Corner Weld Design Change				72.48 Log No.: SE00010
D3-DSC-1; 7/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

has not changed as a result of the weld design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

<u>Possibility of New Malfunction:</u>

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject guide sleeve corner weld design change meets the weld design requirements as established by Pacific Nuclear Fuel Services (PNFS). This change does not affect any design or licensing requirements. The original weld on the drawing was a full length (100%) fillet weld. The revised weld is an intermittent weld which provides approximately 30% of the length of the original weld. However, because the fuel loads are transmitted directly to the spacer discs, the weld stresses are negligible. Based on this information, the subject design change will not affect the form, fit or function of the DSC guide sleeve, is not detrimental to the structural integrity of the guide sleeve, will not obstruct insertion of the fuel assemblies into the guide sleeves and will not adversely affect the ability of the DSC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

<u>Possibility of New Accident:</u>

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

<u>Complete for 50.59 and 72.48:</u>

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

<u>Bases</u> <u>Discussion of why the margin of safety is not reduced</u>

None of the Technical Specifications nor the Bases are affected by this activity.

<u>Complete for 72.48:</u>

NO Will the proposed activity involve a significant increase in occupational dose?

<u>A significant increase in occupational dose:</u>

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a guide sleeve corner weld design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The weld change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

<u>A significant unreviewed environmental impact:</u>

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Corner Weld Design Change			72.48 Log No.: SE00010	
D3-DSC-1; 7/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) guide sleeve corner weld.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Tolerance Design Change				72.48 Log No.: SE00011
D3-DSC-2; 8/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO — Involve an unreviewed safety question (USQ)?
NO — Involve a change in the Technical Specifications/License Conditions or Bases?
NO — Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO — Involve a Significant Increase in Occupational Dose?
NO — Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] PRINTED NAME AND SIGNATURE — Department: NED-CEU 42-01-04 — Date: 11.7.97

YES — Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved — Disapproved
Signature: Mark A. Wright M.A. WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved — Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 — Date: 11.19.97

Recommend Approval ✓ — Recommend Disapproval ______ — Signature: [signature] POSRC CHAIRMAN — Date 11-19-97

Approved ✓ — Disapproved ______ — Signature: [signature] PLANT GENERAL MANAGER — Date 11-19-97

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: J R Lemons — Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.:______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Tolerance Design Change	72.48 Log No.: SE00011
D3-DSC-2; 8/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a tolerance design change to the DSC (Dry Shielded Canister) guide sleeve.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this report.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Tolerance Design Change				72.48 Log No.: SE00011
D3-DSC-2; 8/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

<u>Complete for 50.59 and 72.48:</u>

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Probability of Malfunction:</u>

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the guide sleeve tolerance design change. The subject change in tolerances meets the current design requirement as established by Pacific Nuclear Fuel Services (PNFS). These dimensions are not critical for proper DSC operation. This change has no effect on DSC design. The design change relaxed the tolerances for the lengths of the guide sleeve and flare from ± 0.06" to ± 0.12". The drawing (84-002-E) indicates that the tolerances are applied at the top end for the flare and overall length, and both are +/- 0.12". Since the spacer disc detail shows that the guide sleeves are separated by 1.50", the flare tolerance is acceptable. For the length, the possible additional 0.06" is negligible, and is therefore acceptable. The subject tolerance change will not affect the form, fit or function of the guide sleeve, and will not adversely affect the ability of the DSC to perform its intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Consequences of Malfunction:</u>

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

<u>Probability of Accident:</u>

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the tolerance design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

<u>Consequences of Accident:</u>

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the tolerance design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Tolerance Design Change			72.48 Log No.: SE00011	
D3-DSC-2; 8/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. The subject guide sleeve length and flare dimensional tolerance change meets the design requirements as established by Pacific Nuclear Fuel Services (PNFS). The design change relaxed the tolerances for the lengths of the guide sleeve and flare from ± 0.06" to ± 0.12". The drawing (84-002-E) indicates that the tolerances are applied at the top end for the flare and overall length, and both are +/- 0.12". Since the spacer disc detail shows that the guide sleeves are separated by 1.50", the flare tolerance is acceptable. For the length, the possible additional 0.06" is negligible, and is therefore acceptable. Based on this information, the subject tolerance change will not affect the form, fit or function of the guide sleeve, and will not adversely affect the ability of the DSC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a tolerance design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The tolerance change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Guide Sleeve Tolerance Design Change			72.48 Log No.: SE00011	
D3-DSC-2; 8/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a tolerance design change to the DSC (Dry Shielded Canister) guide sleeve.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Spacer Disc Surface Finish Requirements				72.48 Log No.: SE00012
D3-DSC-3; 9/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
Attachment [signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: [signature] M.A. WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Spacer Disc Surface Finish Requirements				72.48 Log No.: SE00012
D3-DSC-3; 9/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the surface finish requirements of the DSC (Dry Shielded Canister) spacer disc interior cut-outs.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Spacer Disc Surface Finish Requirements			72.48 Log No.: SE00012	
D3-DSC-3; 9/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the spacer disc surface finish requirements design change. The subject design change allowed the interior finish of the spacer disc cut-outs to be relaxed to 500 micro-inches to provide the fabricator a wider choice of cutting methods. The DSC spacer disc cut-out interior surface finish design change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The cut-out finish only needs to be adequate to allow the guide sleeves to be installed in the basket. The drawing (84-002-E) indicates that the outside dimension of a guide sleeve is (8.70" +/- 0.03") + 2(0.105" +/- 0.005") = maximum 8.95". The spacer disc cut-out 9.10" +/- 0.015", thus it has a minimum opening of 9.085". This leaves a gap of (0.135 / 2) = 0.0675" on each side of the guide sleeve (less the finish coat) when centered during insertion. The 500 micro-inch finish, which equals (500)(1/1,000,000) = 0.0005", is insignificant compared to 0.0675". The drawing symbol indicates that this is the minimum finish required. Even if a finish of, say 10 mils is applied, that is still only 0.01" thick". Therefore, the change to the 500 micro-inch surface finish is adequate to allow the guide sleeves to be installed in the basket. This change therefore does not affect the operation or design of the DSC. The subject change in surface finish will not affect the form, fit or function of the spacer disc, will not adversely affect the ability of the DSC to perform it's intended design function, and has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the surface finish requirement design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Spacer Disc Surface Finish Requirements				72.48 Log No.: SE00012
D3-DSC-3; 9/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the surface finish requirement design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. The subject design change allowed the interior finish of the spacer disc cut-outs to be relaxed to 500 micro-inches to provide the fabricator a wider choice of cutting methods. The DSC spacer disc cut-out interior surface finish design change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The cut-out finish only needs to be adequate to allow the guide sleeves to be installed in the basket. The 500 micro-inch finish is insignificant compared to the 0.0675" on each side of the guide sleeve when centered during insertion. Therefore, the change to the 500 micro-inch surface finish is adequate to allow the guide sleeves to be installed in the basket. This change therefore does not affect the operation or design of the DSC. The subject change in surface finish will not affect the form, fit or function of the spacer disc, will not adversely affect the ability of the DSC to perform it's intended design function, and has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a spacer disc surface finish requirements design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The finish requirements change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Spacer Disc Surface Finish Requirements			72.48 Log No.: SE00012	
D3-DSC-3; 9/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the surface finish requirements of the DSC (Dry Shielded Canister) spacer disc interior cut-outs.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Grapple Ring Material Classification Design Change				72.48 Log No.: SE00014
D3-DSC-5; 11/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: [signature] M.A. WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN ~~III~~
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Grapple Ring Material Classification Design Change			72.48 Log No.: SE00014	
D3-DSC-5; 11/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) grapple ring.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Grapple Ring Material Classification Design Change			72.48 Log No.: SE00014	
D3-DSC-5; 11/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the grapple ring material classification design change. The subject activity changed the grapple ring material classification from ASTM A-240 Type 304 to ASME SA-240 Type 304 (see drawing 84-003-E). The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). The grapple ring material classification was upgraded for consistency with the grapple ring code classification. This change does not adversely affect the design, since the material did not change, only the classification of the material. Although the grapple ring material did not change, the designation was upgraded to ASME from ASTM. The ASME material has the same properties as the ASTM, but, in addition, material documentation (chemical/physical characteristics) would be provided. The subject material designation change does not affect the form, fit or function of the grapple ring, and will not adversely affect the ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the grapple ring material classification design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the grapple ring material classification design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Grapple Ring Material Classification Design Change			72.48 Log No.: SE00014	
D3-DSC-5; 11/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

<u>Possibility of New Malfunction:</u>

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed the grapple ring material classification from ASTM A-240 Type 304 to ASME SA-240 Type 304. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). The grapple ring material classification was upgraded for consistency with the grapple ring code classification. This change does not adversely affect the design, since the material did not change, only the classification of the material. Although the grapple ring material did not change, the designation was upgraded to ASME from ASTM. The ASME material has the same properties as the ASTM, but, in addition, material documentation (chemical/physical characteristics) would be provided. The subject material designation change does not affect the form, fit or function of the grapple ring, and will not adversely affect the ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

<u>Possibility of New Accident:</u>

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

<u>Complete for 50.59 and 72.48:</u>

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

<u>Bases</u> <u>Discussion of why the margin of safety is not reduced</u>

None of the Technical Specifications nor the Bases are affected by this activity.

<u>Complete for 72.48:</u>

NO Will the proposed activity involve a significant increase in occupational dose?

<u>A significant increase in occupational dose:</u>

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a grapple ring material classification design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The grapple ring material classification change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

<u>A significant unreviewed environmental impact:</u>

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Grapple Ring Material Classification Design Change	72.48 Log No.: SE00014
D3-DSC-5; 11/129; ES199601368 Supplement 001 Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) grapple ring.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Grapple Ring Inside Grinding Requirement			72.48 Log No.: SE00015	
D3-DSC-6; 12/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: [signature] M.A. Wright
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Grapple Ring Inside Grinding Requirement			72.48 Log No.: SE00015	
D3-DSC-6; 12/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) grapple ring.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Grapple Ring Inside Grinding Requirement			72.48 Log No.: SE00015
D3-DSC-6; 12/129; ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the deletion of the grapple ring grinding requirement design change (see drawing 84-003-E). The subject design change deleted the grinding requirement from the inside surface of the grapple ring to facilitate fabrication (grinding of the surface is difficult) and is not required (a weld crown on the inside surface does not affect the operation of the grapple or DSC). The subject deletion of grapple ring inside surface grinding requirements meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The subject design change will not affect the form, fit or function of the grapple ring , and will not adversely affect the ability of the DSC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the grapple ring grinding requirement design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the grapple ring grinding requirement design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Grapple Ring Inside Grinding Requirement			72.48 Log No.: SE00015	
D3-DSC-6; 12/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject design change deleted the grinding requirement from the inside surface of the grapple ring to facilitate fabrication (grinding of the surface is difficult) and is not required (a weld crown on the inside surface does not affect the operation of the grapple or DSC). The subject deletion of grapple ring inside surface grinding requirements meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The subject design change will not affect the form, fit or function of the grapple ring , and will not adversely affect the ability of the DSC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a grapple ring grinding requirement design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The grapple ring grinding requirement design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Grapple Ring Inside Grinding Requirement			72.48 Log No.: SE00015	
D3-DSC-6; 12/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) grapple ring.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top & Bottom Shield Plug Tolerance Design Change			72.48 Log No.: SE00016	
D3-DSC-7; 13/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO	Involve an unreviewed safety question (USQ)?
NO	Involve a change in the Technical Specifications/License Conditions or Bases?
NO	Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO	Involve a Significant Increase in Occupational Dose?
NO	Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: Mark A. Wright M.A. WRIGHT
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-18-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No ______

Signature: ____________________ Date: ______
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top & Bottom Shield Plug Tolerance Design Change			72.48 Log No.: SE00016	
D3-DSC-7; 13/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top and bottom shield plug plate thickness tolerances.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top & Bottom Shield Plug Tolerance Design Change			72.48 Log No.: SE00016	
D3-DSC-7; 13/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the top and bottom shield plug tolerance design change. The subject design change broadened the thickness tolerances of the top and bottom shield plug plates to provide maximum / minimum calculated thicknesses (see drawing 84-003-E). The subject change in tolerances meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The material thickness in the shield plugs were re-dimensioned to clarify the minimum and maximum acceptable thicknesses of each material. The thicknesses shown represent the bounding analyzed configurations of the DSC. The thickness requirements were computed during the DSC structural analysis. The DSC end plugs provide confinement and radiation shielding. The bottom end plug sandwiches lead between an outer plate and an inner plate of Type 304 stainless steel. The top plug is formed by two covers, separately welded to the DSC stainless steel shell. The inner cover and outer cover are manufactured from Type 304 stainless steel with lead placed between these cover plates. The increase in DSC weight due to the increase in the shield plug thickness is negligible as compared to the weight of the entire DSC. The subject tolerance change will not affect the form, fit or function of the top and bottom shield plugs, and will not adversely affect the ability of the DSC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the top and bottom shield plug tolerance design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top & Bottom Shield Plug Tolerance Design Change			72.48 Log No.: SE00016	
D3-DSC-7; 13/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the top and bottom shield plug tolerance design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. The subject design change broadened the thickness tolerances of the top and bottom shield plug plates to provide maximum / minimum calculated thicknesses. The subject change in tolerances meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The material thickness in the shield plugs were re-dimensioned to clarify the minimum and maximum acceptable thicknesses of each material. The thicknesses shown represent the bounding analyzed configurations of the DSC. The thickness requirements were computed during the DSC structural analysis. The increase in DSC weight due to the increase in the shield plug thickness is negligible as compared to the weight of the entire DSC. The subject tolerance change will not affect the form, fit or function of the top and bottom shield plugs, and will not adversely affect the ability of the DSC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a top and bottom shield plug tolerance design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The top and bottom shield plug tolerance design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top & Bottom Shield Plug Tolerance Design Change			72.48 Log No.: SE00016	
D3-DSC-7; 13/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top and bottom shield plug plate thickness tolerances.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of DSC Lead Casting Full Surface Requirement				72.48 Log No.: SE00017
D3-DSC-8; 14/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11·7·97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Mark A. Wright M.A. Wright
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11·19·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: J. R. Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of DSC Lead Casting Full Surface Requirement			72.48 Log No.: SE00017	
D3-DSC-8; 14/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) lead shielding inspection requirement.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of DSC Lead Casting Full Surface Requirement	72.48 Log No.: SE00017
D3-DSC-8; 14/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

<u>Complete for 50.59 and 72.48:</u>

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Probability of Malfunction:</u>

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the deletion of the lead casting full surface requirement design change. The subject design change deleted the requirement that the lead casting have full surface contact with the shield plug plates to facilitate the fabrication and pouring of the lead plugs (see drawing 84-003-E). The subject design change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). Full surface contact between the lead casting and the shield plug plates is neither necessary nor detectable, since any gap between the lead and the shell would not form a streaming path due to the geometry of the DSC. The gamma scan required by the fabrication specification ensures that full shielding thickness is obtained. This change therefore does not affect the design or operation of the DSC and does not impact any safety or licensing criteria.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Consequences of Malfunction:</u>

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

<u>Probability of Accident:</u>

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the deletion of the lead casting full surface requirement design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

<u>Consequences of Accident:</u>

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the deletion of the lead casting full surface requirement design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject design change deleted the requirement that the lead casting have full surface contact with the shield plug plates to facilitate the fabrication and pouring of the lead plugs. The subject design change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). Full surface contact between the lead casting and the shield plug plates is neither necessary nor detectable, since any gap between the lead and the shell would not form a streaming path due to the geometry of the DSC. The gamma scan required by the fabrication specification ensures that full shielding thickness is obtained. This change therefore does not affect the design or operation of the DSC and does not impact any safety or licensing criteria.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. This activity involved the deletion of the lead casting full surface requirement. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The deletion of the lead casting full surface requirement design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1, since the gamma scan required by the fabrication specification ensured that full shielding thickness was obtained.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of DSC Lead Casting Full Surface Requirement	**72.48 Log No.: SE00017**
D3-DSC-8; 14/129; ES199601368 Supplement 001	**Revision 0000 Page 5 of 5**

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) lead shielding inspection requirement.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Shell Weld Preparation			72.48 Log No.: SE00018	
D3-DSC-9; 15/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11·7·97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Mark A. Wright M.A. WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11·19·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Shell Weld Preparation			72.48 Log No.: SE00018	
D3-DSC-9; 15/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the inside surface of the DSC (Dry Shielded Canister) shell for the top cover bevel weld preparation.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation..

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Shell Weld Preparation			72.48 Log No.: SE00018	
D3-DSC-9; 15/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the design change to the inside surface of the DSC shell for the top cover weld preparation. The subject design change added a bevel of 0.75" x 22.5° to the inside surface of the DSC shell for the top cover weld preparation to facilitate DSC shell fabrication (see 84-003-E). The top end of the DSC shell has a tendency to bow inward during the placement of the shield plug weldment. This change prevents the movement of the shell from interfering with the installation of the top cover plate. The subject change in weld prep configuration meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS), and does not affect the in-use configuration of the DSC. The revising of the DSC shell inside surface weld prep configuration for installation of the top cover plate does not reduce the joint weld throat thickness and does not have a detrimental affect on the weld configuration strength. The subject change does not compromise design integrity, will not affect the form, fit or function of the DSC shell configuration, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the design change to the inside surface of the DSC shell for the top cover weld preparation does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Shell Weld Preparation			72.48 Log No.: SE00018	
D3-DSC-9; 15/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the design change to the inside surface of the DSC shell for the top cover weld preparation, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject design change added a bevel of 0.75" x 22.5° to the inside surface of the DSC shell for the top cover weld preparation to facilitate DSC shell fabrication. The top end of the DSC shell has a tendency to bow inward during the placement of the shield plug weldment. This change prevents the movement of the shell from interfering with the installation of the top cover plate. The subject change in weld prep configuration meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS), and does not affect the in-use configuration of the DSC. The revising of the DSC shell inside surface weld prep configuration for installation of the top cover plate does not reduce the joint weld throat thickness and does not have a detrimental affect on the weld configuration strength. The subject change does not compromise design integrity, will not affect the form, fit or function of the DSC shell configuration, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a design change to the inside surface of the DSC shell for the top cover weld preparation. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The design change to the inside surface of the DSC shell for the top cover weld preparation does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Shell Weld Preparation			72.48 Log No.: SE00018	
D3-DSC-9; 15/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the inside surface of the DSC (Dry Shielded Canister) shell for the top cover bevel weld preparation.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Cover Plate Weld Design Changes				72.48 Log No.: SE00019
D3-DSC-10; 16/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
Getachew Tesfaye 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Mark A. Wright M.A. WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11.19.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: John Carroll Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: John Carroll Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JB Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Cover Plate Weld Design Changes				72.48 Log No.: SE00019
D3-DSC-10; 16/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top cover plate weld preparation and top cover to shell weldment.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Cover Plate Weld Design Changes				72.48 Log No.: SE00019
D3-DSC-10; 16/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the design change to the DSC top cover plate weld preparation and top cover to shell weldment. The subject design change revised the top cover plate weld preparation and the top cover to shell weldment. The top cover weld preparation was reduced from 45 degrees to 30 degrees, and the top cover plate to shell weldment was changed from a 5/8" J weld to a 5/8" V weld (see drawings 84-006-E and 84-009-E). The reason for this design change was to prevent burning through the plate during fabrication. The revised weld symbol, but unchanged plate details, give an identical weld throat to that of the original design. The subject change in weld configuration meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). This change has no effect on the DSC structural calculations. The subject design change does not affect the DSC shell to top cover plate weld NDE (Non-destructive examination) requirements, does not reduce the weld throat thickness, and does not have a detrimental affect on the weld strength. The subject change does not compromise design integrity, will not affect the form, fit or function of the top cover plate to DSC shell configuration, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the design change to the DSC top cover plate weld preparation and top cover to shell weldment does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Cover Plate Weld Design Changes				72.48 Log No.: SE00019
D3-DSC-10; 16/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the design change to the DSC top cover plate weld preparation and top cover to shell weldment, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. The subject design change revised the top cover plate weld preparation and the top cover to shell weldment. The top cover weld preparation was reduced from 45 degrees to 30 degrees, and the top cover plate to shell weldment was changed from a 5/8" J weld to a 5/8" V weld. The reason for this design change was to prevent burning through the plate during fabrication. The revised weld symbol, but unchanged plate details, give an identical weld throat to that of the original design. The subject change in weld configuration meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). This change has no effect on the DSC structural calculations. The subject design change does not affect the DSC shell to top cover plate weld NDE (Non-destructive examination) requirements, does not reduce the weld throat thickness, and does not have a detrimental affect on the weld strength. The subject change does not compromise design integrity, will not affect the form, fit or function of the top cover plate to DSC shell configuration, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a design change to the DSC top cover plate weld preparation and top cover to shell weldment. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The design change to the DSC top cover plate weld preparation and top cover to shell weldment does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Cover Plate Weld Design Changes			72.48 Log No.: SE00019	
D3-DSC-10; 16/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top cover plate weld preparation and top cover to shell weldment.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Siphon Tube Dimensional Design Change				72.48 Log No.: SE00020
D3-DSC-12; 17/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: Mark A. Wright M.A. WRIGHT
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, SS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11.19.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: J R Lemons Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Siphon Tube Dimensional Design Change			72.48 Log No.: SE00020	
D3-DSC-12; 17/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) siphon tube.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Siphon Tube Dimensional Design Change			72.48 Log No.: SE00020	
D3-DSC-12; 17/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the siphon tube dimensional design change. The subject change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The siphon tube was previously dimensioned to be 0.12" below the face of the bottom cover. It is now dimensioned to be 0.19" +/- 0.06" (see drawing 84-004-E), which gives it the range of 0.13" to 0.25" above the bottom of the (bottom cover plate) cut out, which is 0.25" deep. The subject change in siphon tube dimensioning was made to better control the position of the siphon tube in order to reduce the likelihood of the tube becoming clogged during water removal. The siphon tube is used with the Vacuum Drying System to pump water from the canister to the spent fuel pool. The cut-out is designed to capture what little excess water will remain at the bottom of the canister that could not physically be removed. The fact that the siphon tube will be no higher than the top of the cut-out makes this change acceptable. This change does not affect the DSC design or operation, and will not have a detrimental impact on the water removal ability of the siphon tube, in fact, the water removal ability is enhanced. The subject change does not compromise design integrity, will not affect the form, fit or function of the siphon tube or DSC shell configuration, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the siphon tube dimensional design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Siphon Tube Dimensional Design Change			72.48 Log No.: SE00020	
D3-DSC-12; 17/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the siphon tube dimensional design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject change in siphon tube dimensioning was made to better control the position of the siphon tube in order to reduce the likelihood of the tube becoming clogged during water removal. The siphon tube is used with the Vacuum Drying System to pump water from the canister to the spent fuel pool. The cut-out is designed to capture what little excess water will remain at the bottom of the canister that could not physically be removed. The fact that the siphon tube will be no higher than the top of the cut-out makes this change acceptable. This change does not affect the DSC design or operation, and will not have a detrimental impact on the water removal ability of the siphon tube, in fact, the water removal ability is enhanced. The subject change does not compromise design integrity, will not affect the form, fit or function of the siphon tube or DSC shell configuration, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a siphon tube dimensional design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The siphon tube dimensional design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Siphon Tube Dimensional Design Change				72.48 Log No.: SE00020
D3-DSC-12; 17/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) siphon tube.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Drain & Fill Block Bottom Weld				72.48 Log No.: SE00021
D3-DSC-13; 18/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: Mark A Wright M.A. WRIGHT
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11·19·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Drain & Fill Block Bottom Weld	72.48 Log No.: SE00021
D3-DSC-13; 18/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) drain and fill block weldment to the DSC shell.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Drain & Fill Block Bottom Weld			72.48 Log No.: SE00021	
D3-DSC-13; 18/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the deletion of the drain & fill block bottom weld design change. The subject design change deleted the weld between the bottom of the drain/fill block and the DSC shell . The weld was a 5/16" fillet weld, as originally found on DWG DUK-03-1003 of the NUHOMS TR (Topical Report). The subject design change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The function of the weld is served by the fillets on the side and the groove weld on top of the drain & fill block (see 84-004-E). This is structurally acceptable as there will be over 37 inches of weld for the drain & fill block. This change does not affect the DSC design or operation, does not compromise design integrity, will not affect the form, fit or function of the drain and fill block to DSC shell joint, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the deletion of the drain & fill block bottom weld design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the deletion of the drain & fill block bottom weld design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Drain & Fill Block Bottom Weld				72.48 Log No.: SE00021
D3-DSC-13; 18/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject design change deleted the weld between the bottom of the drain/fill block and the DSC shell . The subject design change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The function of the weld is served by the fillets on the side and the groove weld on top of the drain & fill block. This is structurally acceptable as there will be over 37 inches of weld for the drain & fill block. This change does not affect the DSC design or operation, does not compromise design integrity, will not affect the form, fit or function of the drain and fill block to DSC shell joint, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved the deletion of the drain & fill block bottom weld. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The deletion of the drain & fill block bottom weld design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Drain & Fill Block Bottom Weld				72.48 Log No.: SE00021
D3-DSC-13; 18/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) drain and fill block weldment to the DSC shell.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Maximum Length Design Change				72.48 Log No.: SE00022
D3-DSC-14; 19/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-for CEU 42-01-04 Date: 11·7·97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
attachment [signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: [signature] M.A. WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11·19·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Maximum Length Design Change				72.48 Log No.: SE00022
D3-DSC-14; 19/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the length of the DSC (Dry Shielded Canister).

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.1, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Maximum Length Design Change				72.48 Log No.: SE00022
D3-DSC-14; 19/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the DSC maximum length design change. The subject design change increased the DSC design length from 172.87" to 172.93" (see drawing 84-006-E). The subject change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). This change was made to better control this critical interface dimension. The DSC will fit inside the transfer cask under worst case thermal conditions, and as such, this design change has a negligible effect on the interface between the DSC and the transfer cask. The additions of 0.06" of material is negligible from a structural standpoint. The subject change does not compromise design integrity, will not affect the form, fit or function of the DSC, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the DSC maximum length design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the DSC maximum length design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Maximum Length Design Change				72.48 Log No.: SE00022
D3-DSC-14; 19/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject design change increased the DSC design length from 172.87" to 172.93". The subject change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). This change was made to better control this critical interface dimension. The DSC will fit inside the transfer cask under worst case thermal conditions, and as such, this design change has a negligible effect on the interface between the DSC and the transfer cask. The additions of 0.06" of material is negligible from a structural standpoint. The subject change does not compromise design integrity, will not affect the form, fit or function of the DSC, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a DSC maximum length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The DSC maximum length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Maximum Length Design Change				72.48 Log No.: SE00022
D3-DSC-14; 19/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the length of the DSC (Dry Shielded Canister).

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Shield Plug Keyway Design Change				72.48 Log No.: SE00023
D3-DSC-16; 20/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Mark A. Wright M.A. Wright
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11.19.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Shield Plug Keyway Design Change	72.48 Log No.: SE00023
D3-DSC-16; 20/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top lead plug side casing plate keyway.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Shield Plug Keyway Design Change			72.48 Log No.: SE00023	
D3-DSC-16; 20/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the shield plug keyway design change. The subject design change permitted the use of a single bent plate to fabricate the keyway in the top shield plug in lieu of five plates joined by four double v-groove welds surrounding the drain & fill block (see drawing 84-007-E). The reason for this design change was to provide the fabricator the option to bend one piece of material as compared to welding five plates together. The subject change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The use of a single plate to form the shield plug keyway in place of several joined plated does not affect the DSC design or operation. The subject design change, providing the option to form the DSC shield plug keyway from one piece of material, will not adversely affect the form, fit or function of the DSC or the assembly interface between the top shield plug and drain & fill block. Additionally this design change will not have a detrimental impact on the DSC's ability to perform it's intended design function.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the shield plug keyway design change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the shield plug keyway design change, there will be no increase in the accident dose consequences already described in the USAR. The consequences of the accidents described in Chapter 8 of the ISFSI

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Shield Plug Keyway Design Change			72.48 Log No.: SE00023	
D3-DSC-16; 20/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

USAR vary from none to minimal worker exposure. None of these accident scenario consequences will be impacted by the subject design change.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject design change permitted the use of a single bent plate to fabricate the keyway in the top shield plug in lieu of five plates joined by four double v-groove welds surrounding the drain & fill block. The reason for this design change was to provide the fabricator the option to bend one piece of material as compared to welding five plates together. The subject change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The use of a single plate to form the shield plug keyway in place of several joined plated does not affect the DSC design or operation. The subject design change, providing the option to form the DSC shield plug keyway from one piece of material, will not adversely affect the form, fit or function of the DSC or the assembly interface between the top shield plug and drain & fill block. Additionally this design change will not have a detrimental impact on the DSC's ability to perform it's intended design function.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a shield plug keyway design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The shield plug keyway design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Shield Plug Keyway Design Change			72.48 Log No.: SE00023	
D3-DSC-16; 20/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top lead plug side casing plate keyway.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Realignment of Top Cover Plate Lifting Holes				72.48 Log No.: SE00024
D3-DSC-17; 21/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Mark A. Wright M.A. WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: J B Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Realignment of Top Cover Plate Lifting Holes				72.48 Log No.: SE00024
D3-DSC-17; 21/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top cover plate.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) as related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Realignment of Top Cover Plate Lifting Holes			72.48 Log No.: SE00024	
D3-DSC-17; 21/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the realignment of the top cover plate lifting holes. The subject design change realigned the top cover lifting holes to the same locations as those in the top shield plug to reduce streaming through the lifting holes (see drawings 84-002-E, 84-007-E and 84-009-E). The function of the top cover plate lifting holes is to assist with the lifting, positioning, and placement of the 1-1/4" thick top cover plate on the DSC. The lifting holes for both the top shield plug assembly and the top cover plate are right above the support rod locations. There was no change to the diameter, thread pitch, or hole depth. The subject design change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). This change does not affect the DSC interface with any other item, including the welding machine. In addition, this change does not affect the DSC design or operation. This design change has no detrimental impact on the DSC structure, and does not cause an interference with any other component (including the transfer cask). The subject change does not compromise design integrity, will not affect the form, fit or function of the DSC top cover plate, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the realignment of the top cover plate lifting holes does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Realignment of Top Cover Plate Lifting Holes				72.48 Log No.: SE00024
D3-DSC-17; 21/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the realignment of the top cover plate lifting holes, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject design change realigned the top cover lifting holes to the same locations as those in the top shield plug to reduce streaming through the lifting holes. The function of the top cover plate lifting holes is to assist with the lifting, positioning, and placement of the 1-1/4" thick top cover plate on the DSC. The lifting holes for both the top shield plug assembly and the top cover plate are right above the support rod locations. There was no change to the diameter, thread pitch, or hole depth. The subject design change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). This change does not affect the DSC interface with any other item, including the welding machine. In addition, this change does not affect the DSC design or operation. This design change has no detrimental impact on the DSC structure, and does not cause an interference with any other component (including the transfer cask). The subject change does not compromise design integrity, will not affect the form, fit or function of the DSC top cover plate, and will not adversely affect the DSC's ability to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a realignment of the top cover plate lifting holes. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The realignment of the top cover plate lifting holes does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Realignment of Top Cover Plate Lifting Holes			72.48 Log No.: SE00024	
D3-DSC-17; 21/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO   Will the proposed activity involve a significant unreviewed environmental impact?

<u>A significant unreviewed environmental impact:</u>

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top cover plate.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Addition of Shield Plug Backing Bar				72.48 Log No.: SE00025
D3-DSC-18; 22/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Mark A. Wright M.A. Wright
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11.19.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Addition of Shield Plug Backing Bar			72.48 Log No.: SE00025	
D3-DSC-18; 22/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) side casing to top casing plate joint configuration.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Addition of Shield Plug Backing Bar				72.48 Log No.: SE00025
D3-DSC-18; 22/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the addition of the shield plug backing bar. The subject change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The bar is 1/2" x 1/2" ASTM A479 or ASTM A240 Type 304 and is non-safety related (see drawing 84-006-E). The reason for this change was to prevent the lead plug from "wicking" into the side casing plate to casing plate weld pool during fabrication. The joint between the side casing plate and the top casing plate is made after lead has been poured into the shield plug. Lead has a tendency to wick through the joint and into the weld pool during welding. A backing bar has been added in accordance with NB-4435 to reduce the likelihood of this occurrence (see drawing 84-007-E). The addition of the backing bar does not affect the structural calculations. The presence of the backing bar (and the corresponding lack of lead) will slightly increase dose rates during installation of the shield plug. This slight increase will have a negligible effect on occupational doses, which will be offset by the increased ease of placing the shield plug to shell weldment. The shorter time required to install the plug should offset the higher dose rate. Therefore, based on the above information, the subject change does not compromise design integrity, will not affect the form, fit or function of the DSC side casing plate to top casing plate joint configuration, and will not adversely affect the DSC's ability to perform it's intended design function. This design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the addition of the shield plug backing bar does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Addition of Shield Plug Backing Bar				72.48 Log No.: SE00025
D3-DSC-18; 22/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the addition of the shield plug backing bar, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject change meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The bar is 1/2" x 1/2" ASTM A479 or ASTM A240 Type 304 and is non-safety related. The reason for this change was to prevent the lead plug from "wicking" into the side casing plate to casing plate weld pool during fabrication. The joint between the side casing plate and the top casing plate is made after lead has been poured into the shield plug. Lead has a tendency to wick through the joint and into the weld pool during welding. A backing bar has been added in accordance with NB-4435 to reduce the likelihood of this occurrence. The addition of the backing bar does not affect the structural calculations. The presence of the backing bar (and the corresponding lack of lead) will slightly increase dose rates during installation of the shield plug. This slight increase will have a negligible effect on occupational doses, which will be offset by the increased ease of placing the shield plug to shell weldment. The shorter time required to install the plug will offset the higher dose rate. Therefore, based on the above information, the subject change does not compromise design integrity, will not affect the form, fit or function of the DSC side casing plate to top casing plate joint configuration, and will not adversely affect the DSC's ability to perform it's intended design function. This design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Addition of Shield Plug Backing Bar			72.48 Log No.: SE00025	
D3-DSC-18; 22/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved the addition of the shield plug backing bar. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The presence of the backing bar (and the corresponding lack of lead) will slightly increase dose rates during installation of the shield plug. This slight increase will have a negligible effect on occupational doses, which will be offset by the increased ease of placing the shield plug to shell weldment. The shorter time required to install the plug will offset the higher dose rate. Therefore, the addition of the shield plug backing bar does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The subject design change does not involve the ISFSI Updated Environmental Report or deal with any environmental issues.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) side casing to top casing plate joint configuration.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Shield Plug Casing Plate Thickness Tolerance Change			72.48 Log No.: SE00026	
D3-DSC-19; 23/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Mark A. Wright M.A. WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gaharan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Shield Plug Casing Plate Thickness Tolerance Change			72.48 Log No.: SE00026	
D3-DSC-19; 23/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top shield plug casing plate thickness tolerances.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Shield Plug Casing Plate Thickness Tolerance Change			72.48 Log No.: SE00026	
D3-DSC-19; 23/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the top shield plug casing plate thickness tolerance change. The subject design change allowed the thickness of the top shield plug top casing plate to vary between 0.24" and 0.52" to allow the fabricator flexibility in machining the top shield plug casing plate (see drawing 84-007-E). The previously allowed range was 0.24" to 0.30". The subject change in tolerances meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The design change made to provide the fabricator with additional flexibility to achieve a flat surface. The fabricator can start with a 1/2" thick plate and does not have to machine it if it meets the flatness tolerance. The minimum allowable thickness is unchanged. The maximum DSC length is controlled separately, so the additional allowed thickness will not affect the cask / DSC interface. The increase in DSC weight due to the potential increase in top shield plug casing plate thickness is extremely negligible compared to the weight of the DSC. The subject tolerance change will not affect the form, fit or function of the top shield plug casing plate, and will not adversely affect the ability of the DSC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the top shield plug casing plate thickness tolerance change does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Shield Plug Casing Plate Thickness Tolerance Change				72.48 Log No.: SE00026
D3-DSC-19; 23/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the top shield plug casing plate thickness tolerance change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. The subject design change allowed the thickness of the top shield plug top casing plate to vary between 0.24" and 0.52" to allow the fabricator flexibility in machining the top shield plug casing plate. The previously allowed range was 0.24" to 0.30". The subject change in tolerances meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). The design change made to provide the fabricator with additional flexibility to achieve a flat surface. The fabricator can start with a 1/2" thick plate and does not have to machine it if it meets the flatness tolerance. The minimum allowable thickness is unchanged. The maximum DSC length is controlled separately, so the additional allowed thickness will not affect the cask / DSC interface. The increase in DSC weight due to the potential increase in top shield plug casing plate thickness is extremely negligible compared to the weight of the DSC. The subject tolerance change will not affect the form, fit or function of the top shield plug casing plate, and will not adversely affect the ability of the DSC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a top shield plug casing plate thickness tolerance change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The top shield plug casing plate thickness tolerance change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Top Shield Plug Casing Plate Thickness Tolerance Change			72.48 Log No.: SE00026	
D3-DSC-19; 23/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the DSC (Dry Shielded Canister) top shield plug casing plate thickness tolerances.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Weld Upgrades				72.48 Log No.: SE00027
D3-DSC-20; 24/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: [signature] H.A. WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .:______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Weld Upgrades				72.48 Log No.: SE00027
D3-DSC-20; 24/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses weld upgrades to the DSC (Dry Shielded Canister).

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

   NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

   Probability of Malfunction:

   The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the DSC weld upgrades. The following changes were made to the DSC, which are shown on drawing 84-007-E:

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Weld Upgrades				72.48 Log No.: SE00027
D3-DSC-20; 24/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

1) A test port was added to the shield plug to demonstrate leak tightness of the shield plug welds. The test port is welded out and vacuum box tested after the shield plug pressure testing is completed.
2) A 5/16" backing fillet was added to the weld between the side casing and top pressure plates.
3) The welds joining the keyway plates were upgraded from 1/4" groove welds to full penetration welds.
4) Added PT requirements to the welds between the casing plate and the lifting lug posts and center post.

The welds were upgraded to allow the shield plug to be pressure tested through the test port to demonstrate leak tightness of the shield plug. The side casing and keyway weldments were upgraded to reduce the likelihood of leakage during final weld-out of the plug. The test port weld is a 3/8" groove weld. Under normal and accident DSC internal pressures, this weld resists the pressure load on the 2.0" diameter lug. The shear stress induced in the weld is minor (less than 1 ksi). The resistance strength of the 3/8" single vee groove weld is 21 ksi, which far exceeds the expected stress in the weld. During the drop accident, this weld resists the 75g acceleration of the 2.0" diameter by 1/2" thick plug. Therefore, the addition of the test port will not adversely affect the integrity of the DSC. The addition of the test port does not affect the fit, form, or function of the DSC. The changes described above are considered upgrades to the DSC design and do not adversely affect the DSC. During the DSC fabrication process final inspection, leakage was observed through a breakdown in the top shield plug welds. The side casing and keyway weldments were upgraded to reduce the likelihood of leakage during the final weld-out of the plug. Since these changes will improve the integrity of the DSC and will not affect any other ISFSI SSC, the proposed activity does not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the proposed activity. One accident scenario described in the ISFSI USAR addresses DSC leakage. The accident would be associated with this activity if the DSC did not meet design requirements and did not maintain integrity. However, the DSC meets it design requirements and will maintain integrity. The DSC design was changed to upgrade the welds on the top and side casing plates. The welds were upgraded to allow the shield plug to be pressure tested through the test port to demonstrate leak tightness of the shield plug. The side casing and keyway weldments were upgraded to reduce the likelihood of leakage during final weld-out of the plug. Under normal and accident DSC internal pressures, this weld resists the pressure load on the 2.0" diameter lug. Therefore, the addition of the test port will not adversely affect the integrity of the DSC. The addition of the test port does not affect the fit, form, or function of the DSC. The changes are considered upgrades to the DSC design and does not adversely affect the DSC. Since the DSC meets it's design requirements and will maintain integrity, the proposed activity will not affect the possibility of occurrence of an accident. Based on the above discussion and a thorough review of all applicable documents, it was concluded that this proposed activity would not increase the probability of occurrence of an accident previously evaluated in the SAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Weld Upgrades			72.48 Log No.: SE00027	
D3-DSC-20; 24/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The proposed activity does not affect the resulting dose rate in or around the HSM or DSC. The DSC meets it's design requirements and will maintain it's integrity. Therefore, the ISFSI SSCs will not be adversely affected and will remain intact as designed.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of the proposed activity. The subject change does not compromise design integrity, and will not affect the form, fit or function of the DSC. Therefore, this design change has no detrimental impact on equipment important to safety. In regard to the proposed change, no credible scenario can be postulated which could create a malfunction of a different type than any previously evaluated in the SAR. After a thorough review, it was concluded that this activity would not create the possibility of a malfunction of a different type than any previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
3/4.2.2	DSC Closure Welds - The proposed activity is a DSC design change which upgraded the welds in the top and side casing plates. It does not affect any other ISFSI SSC. The bases of this technical specification is to ensure that the safety analysis of leak tightness of the DSC is maintained. The safety analysis is based on a weld being leak tight to 10E-4 atm-cc/s. This activity upgrades the welds to ensure that that leak tightness is obtained. Therefore, the proposed activity does not affect this technical specification, and therefore, does not affect the margin of safety associated with this technical specification.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided weld upgrades to the DSC. BGE approved these weld upgrades for construction prior to the issuance of the ISFSI license in November, 1992. The weld upgrades to the DSC do not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Weld Upgrades			72.48 Log No.: SE00027	
D3-DSC-20; 24/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

<u>A significant unreviewed environmental impact:</u>

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses weld upgrades to the DSC (Dry Shielded Canister).

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Guide Sleeve Inside Dimension Non Conformance				72.48 Log No.: SE00028
D4-DSC-1; 25/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Mark A. Wright M.A.WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11.19.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JM Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Guide Sleeve Inside Dimension Non Conformance			72.48 Log No.: SE00028	
D4-DSC-1; 25/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the DSC (Dry Shielded Canister) guide sleeves identified during DSC fabrication. This non conformance applies only to DSC BGE24P-R001.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Guide Sleeve Inside Dimension Non Conformance	72.48 Log No.: SE00028
D4-DSC-1; 25/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the guide sleeve inside dimension non conformance. The subject non conformance (Ranor, Inc. NCR No. 9500-3) identifies the DSC guide sleeves having oversize inside dimensions. The allowable dimension is 8.70" +/- 0.03" (see drawing 84-002-E). The maximum recorded deviation is 0.025" over the high tolerance limit. The oversize dimension has no effect on the design as long as the guide sleeves fit in the basket assembly. The fuel assemblies are located in the basket assembly by the spacer disc cutouts and the guide sleeve thickness. Neither of these items are out of tolerance. It must be noted that this non conformance applies only to DSC BGE24P-R001, which was loaded and stored in the HSM in 1996. The minimum possible gap between the inside of the spacer disc cutout and the outside of the guide sleeve is 0.0675" less the finish thickness. This non conformance reduces the possible gap to {0.0675" - (0.025" / 2)} = 0.0675" - 0.0125 = 0.0550". This still leaves enough of a gap for the required minimum 500 micro-inch finish. The subject non conformance meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on the above information and a review of the design drawings, the subject non conformance will not affect the form, fit or function of the DSC, is not detrimental to the structural integrity of the DSC, and will not adversely affect the ability of the DSC to perform it's intended design function. There is no detrimental operational impact associated with this activity. Additionally, the subject justification will not create any component assembly interference, including the guide sleeve and spacer disc interface. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the guide sleeve inside dimension non conformance does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the DSC has not changed as a result of the guide sleeve inside dimension non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the DSC guide sleeves having oversize inside dimensions. It must be noted that this non conformance applies only to DSC BGE24P-R001. The minimum possible gap between the inside of the spacer disc cutout and the outside of the guide sleeve is not reduced as a result of this non conformance. The subject non conformance meets the current design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on the above information and a review of the design drawings, the subject non conformance will not affect the form, fit or function of the DSC, is not detrimental to the structural integrity of the DSC, and will not adversely affect the ability of the DSC to perform it's intended design function. There is no detrimental operational impact associated with this activity. Additionally, the subject justification will not create any component assembly interference, including the guide sleeve and spacer disc interface. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a guide sleeve inside dimension non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The guide sleeve inside dimension non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Guide Sleeve Inside Dimension Non Conformance			72.48 Log No.: SE00028	
D4-DSC-1; 25/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

<u>A significant unreviewed environmental impact:</u>

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the DSC (Dry Shielded Canister) guide sleeves identified during DSC fabrication. This non conformance applies only to DSC BGE24P-R001.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Bottom Interior Seal Weld Non Conformance			72.48 Log No.: SE00030	
D4-DSC-3; 27/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
Getachew Tesfaye 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Mark A. Wright M.A.WRIGHT
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-132 Date: 11-19-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-19-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11-19-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Bottom Interior Seal Weld Non Conformance			72.48 Log No.: SE00030	
D4-DSC-3; 27/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the DSC (Dry Shielded Canister) bottom interior seal weld identified during DSC fabrication. This non conformance applies only to DSC Nos. BGE24P-R001, BGE24P-R002, and BGE24P-R003.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Special Note: This proposed activity was presented as a 10 CFR 72.48 safety evaluation to the Plant Operations and Safety Review Committee (POSRC) on April 6, 1992, Meeting No. 92-035. POSRC reviewed and recommended approval of the safety evaluation to the Plant General Manager, who subsequently approved the safety evaluation. Since this safety evaluation was approved prior to the issuance of the ISFSI 10 CFR 72.48 license, the change was incorporated in the first revision of the original SAR. As stated above, this safety evaluation was performed even though the change was incorporated into the ISFSI USAR.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Bottom Interior Seal Weld Non Conformance			72.48 Log No.: SE00030	
D4-DSC-3; 27/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of the DSC bottom interior seal weld non conformance. The subject non conformance (Ranor, Inc. NCR No. 9500-6) identifies that the interior 1/4" seal weld at the bottom end of the DSC was not made with at least two passes and at least two levels of PT inspection (see drawing 84-003-E). The subject closure weld was made with a single pass and a single liquid penetrant (PT) inspection was performed on the weld. The PT inspection showed the weld to be satisfactory. It must be noted that this non conformance applies only to DSC Nos. BGE24P-R001, BGE24P-R002, and BGE24P-R003. All other DSC's meet the existing requirement for the weld. The safety function of the DSC is to provide a physical containment barrier to prevent the release of radioactive materials from spent fuel which is stored inside. The double closure welds at each end of the canisters form a part of this physical containment barrier. The structural quality of the double closure seal weld is not affected by the number of passes. The multiple liquid penetrant inspection, which reduces the probability of coincidental pinhole flaws, is compensated by the requirement to leak test the weld. Leak testing the closure weld provides positive assurance of leak tightness. There is no reduction in the structural support or quality of the DSC. The subject non conformance meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on the above information and a review of the design drawings, the subject non conformance is not detrimental to the structural integrity of the DSC and will not adversely affect the ability of the DSC to perform it's intended design function. Leak testing of the closure weld assures leak tightness of the DSC and compensates for the liquid penetrant inspection. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the DSC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the proposed activity. One accident scenario described in the ISFSI USAR addresses DSC leakage. The accident would be associated with this activity if the DSC did not meet design requirements and did not maintain integrity. However, the DSC meets it design requirements and passes it's required acceptance testing. Since the DSC bottom interior seal weld non conformance does not adversely affect the ability of the DSC to perform it's intended design function, the structural integrity of the DSC is not affected, and as such, the probability of occurrence of the DSC leakage accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Bottom Interior Seal Weld Non Conformance			72.48 Log No.: SE00030	
D4-DSC-3; 27/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. Since the intended design function of the DSC has not changed as a result of the DSC bottom interior seal weld non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies that the interior 1/4" seal weld at the bottom end of the DSC was not made with at least two passes and at least two levels of PT inspection. The subject closure weld was made with a single pass and a single liquid penetrant (PT) inspection was performed on the weld. The PT inspection showed the weld to be satisfactory. It must be noted that this non conformance applies only to DSC Nos. BGE24P-R001, BGE24P-R002, and BGE24P-R003. All other DSC's meet the existing requirement for the weld. The multiple liquid penetrant inspection, which reduces the probability of coincidental pinhole flaws, is compensated by the requirement to leak test the weld. Leak testing the closure weld provides positive assurance of leak tightness. There is no reduction in the structural support or quality of the DSC. The subject non conformance meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on the above information and a review of the design drawings, the subject non conformance is not detrimental to the structural integrity of the DSC and will not adversely affect the ability of the DSC to perform it's intended design function. Leak testing of the closure weld assures leak tightness of the DSC and compensates for the liquid penetrant inspection. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
3/4.2.2	This technical specification addresses the minimum allowable leak tightness for DSC closure welds. To ensure compliance with this technical specification, the USAR specifies a certain sequence of events including the performance of NDE on the DSC seal welds prior to performance of helium leak testing. This order of operations is consistent with the manufacturer design as detailed in the NUHOMS-24P Topical Report, Section 5.1, Operation Description, which describes the performance of dye penetrant weld examination of the seal weld just after the weld is created. As such, the margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - DSC Bottom Interior Seal Weld Non Conformance			72.48 Log No.: SE00030	
D4-DSC-3; 27/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a DSC bottom interior seal weld non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The DSC bottom interior seal weld non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the DSC (Dry Shielded Canister) bottom interior seal weld identified during DSC fabrication. This non conformance applies only to DSC Nos. BGE24P-R001, BGE24P-R002, and BGE24P-R003.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper & Lower Trunnion Design Changes				72.48 Log No.: SE00033
D3-TC-1; 30/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11·7·97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved Approved Disapproved

Signature: [signature] Jon N. Woodfield Signature: Michael J. Gahan
INDEPENDENT REVIEWER for GS-DES, ES-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11·24·97

Recommend Approval ✓ Recommend Disapproval ________ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ________ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ________ No X

Signature: J R Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ________________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper & Lower Trunnion Design Changes	72.48 Log No.: SE00033
D3-TC-1; 30/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate ISFSI design changes that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses design changes to the TC (Transfer Cask) upper and lower trunnion sleeves.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper & Lower Trunnion Design Changes			72.48 Log No.: SE00033	
D3-TC-1; 30/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the upper & lower trunnion design changes. The subject activity changed the material for the trunnion sleeves to SA 182 F304N (see drawing 84-021-E). They were 533 Gr B Cl2 or 508 Cl 3A (upper) and 516 Gr 70 or 508 Cl 3A (lower). The outer diameter of the upper trunnion sleeves (see drawing 84-023-E) was changed to 17.0" from 15.15". The subject changes meet the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). The trunnion changes were analyzed in revision 4 of calculation BGE001.0202. The revised trunnion analysis shows that stresses due to the design basis loads remain below allowables. A review of calculation BGE001.0202, Transfer Cask Structural Analysis, revealed that the upper and lower trunnions (with the new material SA 182, F304N) were analyzed for seven load conditions (three handling and four transportation). The total design weight of the transfer cask and DSC is 200k, versus an estimated absolute worst case actual weight of 188.5k. Trunnion stresses were limited to Fy/6 or Fu/10. In addition, all handling cases were increased by 15% for motion loads. This is required per CMAA #70. The revised trunnion design is therefore acceptable from a structural standpoint, and has no operational or radiological impact. Based on this information, the subject design changes will not affect the form, fit or function of the TC trunnions, are not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. These design changes do not affect the lifting or positioning of the transfer cask. Therefore, these design changes have no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the upper & lower trunnion design changes do not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper & Lower Trunnion Design Changes				72.48 Log No.: SE00033
D3-TC-1; 30/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the upper & lower trunnion design changes, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed the material for the trunnion sleeves and the outer diameter of the upper trunnion sleeves was increased. The subject changes meet the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). The trunnion changes were analyzed in revision 4 of calculation BGE001.0202. The revised trunnion analysis shows that stresses due to the design basis loads remain below allowables. The revised trunnion design is therefore acceptable from a structural standpoint, and has no operational or radiological impact. Based on this information, the subject design changes will not affect the form, fit or function of the TC trunnions, are not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. These design changes do not affect the lifting or positioning of the transfer cask. Therefore, these design changes have no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided upper & lower trunnion design changes. BGE approved these design changes for construction prior to the issuance of the ISFSI license in November, 1992. The upper & lower trunnion design changes do not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper & Lower Trunnion Design Changes			72.48 Log No.: SE00033	
D3-TC-1; 30/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

<u>A significant unreviewed environmental impact:</u>

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate ISFSI design changes that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses design changes to the TC (Transfer Cask) upper and lower trunnion sleeves.

Reason for Activity: These design changes were fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. These design changes were included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Structural Shell Upper Section Design Change		72.48 Log No.: SE00034		
D3-TC-2; 31/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11-24-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: J R Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Structural Shell Upper Section Design Change			72.48 Log No.: SE00034	
D3-TC-2; 31/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) upper trunnion structural shell.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Structural Shell Upper Section Design Change				72.48 Log No.: SE00034
D3-TC-2; 31/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the upper trunnion structural shell design change. The subject activity involved the replacement of the 2" thick trunnion insert plates with the 2" thick upper shell section (see drawing 84-023-E). The 2" thick portion of the structural shell is equal to, or larger than, the insert plate that it replaces. The penetration stresses calculated in BGE001.0202 are therefore conservative for the 2" thick upper shell and no additional calculations are required. The revised design has no significant radiological or operational impact. A review of calculation BGE001.0202, Transfer Cask Structural Analysis, revealed that the use of a thicker shell in lieu of insert plates will indeed result in a more conservative design. Based on this information, the subject design change will not affect the form, fit or function of the TC upper trunnions, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. The increase in weight of the TC caused by the increased shell thickness is insignificant compared to the weight of the entire TC. This small weight increase would not be detrimental during the lifting or positioning of the TC. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the upper trunnion structural shell design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Structural Shell Upper Section Design Change			72.48 Log No.: SE00034	
D3-TC-2; 31/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the upper trunnion structural shell design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity involved the replacement of the 2" thick trunnion insert plates with the 2" thick upper shell section. The 2" thick portion of the structural shell is equal to, or larger than, the insert plate that it replaces. The penetration stresses calculated in BGE001.0202 are therefore conservative for the 2" thick upper shell and no additional calculations are required. The revised design has no significant radiological or operational impact. A review of calculation BGE001.0202, Transfer Cask Structural Analysis, revealed that the use of a thicker shell in lieu of insert plates will indeed result in a more conservative design. Based on this information, the subject design change will not affect the form, fit or function of the TC upper trunnions, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. The increase in weight of the TC caused by the increased shell thickness is insignificant compared to the weight of the entire TC. This small weight increase would not be detrimental during the lifting or positioning of the TC. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided an upper trunnion structural shell design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The upper trunnion structural shell design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Structural Shell Upper Section Design Change			72.48 Log No.: SE00034	
D3-TC-2; 31/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) upper trunnion structural shell.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Sleeve Weld Design Change				72.48 Log No.: SE00035
D3-TC-3; 32/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk ________ Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
11/12/97 SIGNATURE / DATE	11/10/97 SIGNATURE / DATE	11/11/97 SIGNATURE / DATE

Approved Disapproved — Approved Disapproved

Signature: Jon N Woodfield INDEPENDENT REVIEWER — Signature: Michael J. Gahan for ~~GS-DES~~, GS-TES, or PE-PDSU MICHAEL J. GAHAN III

Date 11/12/97 — Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11.24.97

Recommend Approval ✓ Recommend Disapproval ________ Signature: ________ Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ________ Signature: ________ Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ________ No X

Signature: ________ Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Sleeve Weld Design Change			72.48 Log No.: SE00035	
D3-TC-3; 32/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) upper trunnion sleeve.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Sleeve Weld Design Change			72.48 Log No.: SE00035	
D3-TC-3; 32/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the upper trunnion sleeve design change. The subject activity deleted the inconel butter layer from the end of the upper trunnion sleeves, and also changed the weldment between the upper trunnion sleeve and the trunnion from a 7/8" "J" weld with a 3/8" fillet to a 1-1/4" "J" weld with a 3/8" fillet (see drawing 84-018-E). The butter layer was no longer needed since the upper trunnion sleeve was changed to stainless steel. The weld size was increased to add strength to the upper trunnion to trunnion sleeve joint. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Inconel butter requirements are not needed for corrosion protection because the trunnion sleeve was changed to stainless steel. The redesigned weld detail is analyzed in calculation BGE001.0202. A review of calculation BGE001.0202, Transfer Cask Structural Analysis, revealed that all actual weld stresses were below the allowables. The welding filler material used was ERNICR-3 or AWS ENICRFE-3. The critical lift analysis yielded the highest actual to allowable stresses in both potential failure planes of 0.88 and 0.66, respectively, where 1.00 is the point that the actuals equal the allowables. The revised design is therefore acceptable from a structural standpoint. The revised design has no operational or radiological impact. Based on this information, the subject design change, deleting of the stainless butter layer and increasing the subject weld size, will not affect the form, fit or function of the TC trunnions, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the lifting or positioning of the transfer cask. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the upper trunnion sleeve design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Sleeve Weld Design Change				72.48 Log No.: SE00035
D3-TC-3; 32/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the upper trunnion sleeve design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity deleted the inconel butter layer from the end of the upper trunnion sleeves, and also changed the weldment between the upper trunnion sleeve and the trunnion. The butter layer was no longer needed since the upper trunnion sleeve was changed to stainless steel. The weld size was increased to add strength to the upper trunnion to trunnion sleeve joint. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). A review of calculation BGE001.0202, Transfer Cask Structural Analysis, revealed that all actual weld stresses were below the allowables. The welding filler material used was ERNICR-3 or AWS ENICRFE-3. The critical lift analysis yielded the highest actual to allowable stresses in both potential failure planes of 0.88 and 0.66, respectively, where 1.00 is the point that the actuals equal the allowables. The revised design is therefore acceptable from a structural standpoint. The revised design has no operational or radiological impact. Based on this information, the subject design change, deleting of the stainless butter layer and increasing the subject weld size, will not affect the form, fit or function of the TC trunnions, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the lifting or positioning of the transfer cask. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided an upper trunnion sleeve design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The upper trunnion sleeve design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Sleeve Weld Design Change				72.48 Log No.: SE00035
D3-TC-3; 32/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) upper trunnion sleeve.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Sleeve Design Changes				72.48 Log No.: SE00036
D3-TC-4; 33/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11-24-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Sleeve Design Changes			72.48 Log No.: SE00036	
D3-TC-4; 33/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate ISFSI design changes that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses design changes to the TC (Transfer Cask) lower trunnion sleeve.

Reason for Activity: These design changes were fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. These design changes were included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Sleeve Design Changes			72.48 Log No.: SE00036	
D3-TC-4; 33/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the lower trunnion sleeve design changes. The subject activity deleted the stainless butter layer from the end of the lower trunnion sleeve, and increased the height of the sleeve from 4.25" to 4.5" (see drawing 84-024-E). Since the lower trunnion sleeve was changed to stainless steel, the subject butter layer was no longer needed. The butter layer was used to provide corrosion protection for the carbon steel trunnion sleeve. The height of the lower trunnion sleeve was changed to compensate for the increased thickness of the structural shell upper section. The structural shell upper section thickness was increased by 1/2" to 2", and centerline increase is therefore (1/2") / (2) = 1/4". The subject changes meet the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Revision 4 of calculation BGE001.0202 shows that the stress intensities in the redesigned trunnion are below allowables for each of the design basis loadings. In addition, a review of calculation BGE001.0202, Transfer Cask Structural Analysis, revealed that all actual weld stresses were below the allowables. The revised trunnion design is therefore acceptable from a structural standpoint, and has no operational or radiological impact. Based on this information, the subject design changes will not affect the form, fit or function of the TC trunnions, are not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. These design changes do not affect the lifting or positioning of the transfer cask. Therefore, these design changes have no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the lower trunnion sleeve design changes do not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Sleeve Design Changes			72.48 Log No.: SE00036	
D3-TC-4; 33/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the lower trunnion sleeve design changes, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity deleted the stainless butter layer from the end of the lower trunnion sleeve, and increased the height of the sleeve from 4.25" to 4.5". The subject changes meet the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Revision 4 of calculation BGE001.0202 shows that the stress intensities in the redesigned trunnion are below allowables for each of the design basis loadings. In addition, a review of calculation BGE001.0202, Transfer Cask Structural Analysis, revealed that all actual weld stresses were below the allowables. The revised trunnion design is therefore acceptable from a structural standpoint, and has no operational or radiological impact. Based on this information, the subject design changes will not affect the form, fit or function of the TC trunnions, are not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. These design changes do not affect the lifting or positioning of the transfer cask. Therefore, these design changes have no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided lower trunnion sleeve design changes. BGE approved these design changes for construction prior to the issuance of the ISFSI license in November, 1992. The lower trunnion sleeve design changes do not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Sleeve Design Changes			72.48 Log No.: SE00036	
D3-TC-4; 33/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate ISFSI design changes that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses design changes to the TC (Transfer Cask) lower trunnion sleeve.

Reason for Activity: These design changes were fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. These design changes were included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Surface Finish Requirements Design Change				72.48 Log No.: SE00037
D3-TC-5; 34/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO	Involve an unreviewed safety question (USQ)?
NO	Involve a change in the Technical Specifications/License Conditions or Bases?
NO	Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO	Involve a Significant Increase in Occupational Dose?
NO	Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved (circled) Disapproved — Approved (circled) Disapproved

Signature: [signature] Jon N. Woodfield INDEPENDENT REVIEWER
Date 11/12/97

Signature: [signature] for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11-24-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] POSRC CHAIRMAN Date 11-24-97

Approved ✓ Disapproved ______ Signature: [signature] PLANT GENERAL MANAGER Date 11/25/97

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] OSSRC SES CHAIRMAN Date: 1/30/98

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Surface Finish Requirements Design Change			72.48 Log No.: SE00037	
D3-TC-5; 34/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) surface finish requirements.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Surface Finish Requirements Design Change			72.48 Log No.: SE00037	
D3-TC-5; 34/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the surface finish requirements design change. The subject activity improved the cask surface finish requirements on all exposed surfaces to 63 micro-inches rms (see drawing 84-021-E). The sole reason for this design change was to improve the TC surface finish to facilitate cask decontamination. This change does not change the structural adequacy of the cask. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC structural shell, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the lifting or positioning of the transfer cask. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the surface finish requirements design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the surface finish requirements design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Surface Finish Requirements Design Change			72.48 Log No.: SE00037	
D3-TC-5; 34/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity improved the cask surface finish requirements on all exposed surfaces to 63 micro-inches rms. The sole reason for this design change was to improve the TC surface finish to facilitate cask decontamination. This change does not change the structural adequacy of the cask. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC structural shell, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the lifting or positioning of the transfer cask. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a surface finish requirements design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The surface finish requirements design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Surface Finish Requirements Design Change			72.48 Log No.: SE00037	
D3-TC-5; 34/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) surface finish requirements.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Bottom Cover Plate Design Changes	**72.48 Log No.: SE00038**
D3-TC-6; 35/129; ES199601368 Supplement 001 Revision 0000	**Page 1 of 5**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO	Involve an unreviewed safety question (USQ)?
NO	Involve a change in the Technical Specifications/License Conditions or Bases?
NO	Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO	Involve a Significant Increase in Occupational Dose?
NO	Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved (circled) Disapproved — Approved (circled) Disapproved

Signature: [signature] Jon N. Woodfield — INDEPENDENT REVIEWER
Date 11/12/97

Signature: Michael J. Gahan — for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11·24·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Lemon Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Bottom Cover Plate Design Changes			72.48 Log No.: SE00038	
D3-TC-6; 35/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate ISFSI design changes that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses design changes to the TC (Transfer Cask) bottom cover plate.

Reason for Activity: These design changes were fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. These design changes were included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Bottom Cover Plate Design Changes			72.48 Log No.: SE00038	
D3-TC-6; 35/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the bottom cover plate design changes. The subject activity moved the bottom cover bolt circle out and the seal installation groove in to allow the bottom cover seal to be placed inside the bolt circle (see drawings 84-027-E and 84-030-E). The bolt circle on the temporary shield plug was changed accordingly. The reason for these changes was to reduce the likelihood of leakage through the cask bottom cover. The subject changes meet the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). These changes do not change the structural adequacy of the cask. The bottom cover plate assembly is to be used for transfer cask operations within the Auxiliary Building. The temporary shield plug is to be installed for all cask operations outside of the Auxiliary Building during which spent fuel is present. The design changes are therefore acceptable from a structural standpoint, and have no operational or radiological impact. Based on this information, the subject design changes will not affect the form, fit or function of the TC bottom cover plate, are not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. These design changes do not affect the lifting or positioning of the transfer cask. Therefore, these design changes have no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the bottom cover plate design changes do not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Bottom Cover Plate Design Changes			72.48 Log No.: SE00038	
D3-TC-6; 35/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the bottom cover plate design changes, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity moved the bottom cover bolt circle out and the seal installation groove in to allow the bottom cover seal to be placed inside the bolt circle. The bolt circle on the temporary shield plug was change accordingly. The reason for these changes was to reduce the likelihood of leakage through the cask bottom cover. The subject changes meet the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). These changes do not change the structural adequacy of the cask. The design changes have no operational or radiological impact. Based on this information, the subject design changes will not affect the form, fit or function of the TC bottom cover plate, are not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. These design changes do not affect the lifting or positioning of the transfer cask. Therefore, these design changes have no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided bottom cover plate design changes. BGE approved these design changes for construction prior to the issuance of the ISFSI license in November, 1992. The bottom cover plate design changes do not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Bottom Cover Plate Design Changes			72.48 Log No.: SE00038	
D3-TC-6; 35/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate ISFSI design changes that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses design changes to the TC (Transfer Cask) bottom cover plate.

Reason for Activity: These design changes were fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. These design changes were included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Attachment Design Change				72.48 Log No.: SE00039
D3-TC-7; 36/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved (Approved circled)

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved (Approved circled)

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11.24.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Attachment Design Change			72.48 Log No.: SE00039	
D3-TC-7; 36/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) upper trunnion covers.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Attachment Design Change			72.48 Log No.: SE00039	
D3-TC-7; 36/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the upper trunnion attachment design change. The subject activity removed the tapped holes for the upper trunnion covers and added a weld between the trunnion and cover (see drawing 84-029-E). The reason for this design change was to eliminate the trapping of crud between the cover plate and trunnion, thus easing cask decontamination. The method of attachment for the upper trunnion covers was changed from bolting to welding (5/16" all-around fillet weld). The gap between the cover and the trunnion was thus removed, easing the decontamination of the cask. The weld material provides equivalent strength to the bolts that were replaced. This change therefore, has no negative impact on the structural adequacy of the cask. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC upper trunnions, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the lifting or positioning of the transfer cask. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the upper trunnion attachment design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Attachment Design Change				72.48 Log No.: SE00039
D3-TC-7; 36/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the upper trunnion attachment design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity removed the tapped holes for the upper trunnion covers and added a weld between the trunnion and cover. The reason for this design change was to eliminate the trapping of crud between the cover plate and trunnion, thus easing cask decontamination. The method of attachment for the upper trunnion covers was changed from bolting to welding (5/16" all-around fillet weld). The gap between the cover and the trunnion was thus removed, easing the decontamination of the cask. The weld material provides equivalent strength to the bolts that were replaced. This change therefore, has no negative impact on the structural adequacy of the cask. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC upper trunnions, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the lifting or positioning of the transfer cask. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a upper trunnion attachment design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The upper trunnion attachment design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Attachment Design Change				72.48 Log No.: SE00039
D3-TC-7; 36/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) upper trunnion covers.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Relief Holes Threading				72.48 Log No.: SE00040
D3-TC-8; 37/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER
Date 11/12/97

Approved Disapproved
Signature: Michael J. Gahan III
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11-24-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Relief Holes Threading	72.48 Log No.: SE00040
D3-TC-8; 37/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) top flange.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Relief Holes Threading			72.48 Log No.: SE00040	
D3-TC-8; 37/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

<u>Complete for 50.59 and 72.48:</u>

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Probability of Malfunction:</u>

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the top flange relief holes threading design change. The subject activity added threads to the relief holes in the TC top flange to allow them to be plugged when the cask is immersed in the fuel pool (see drawing 84-022-E). This helps ease the decontamination of the top cover bolt holes before installation of the cover. Water relief holes are tapped 3/8"-16 UNC-2B x .50" deep, and are provided at each pin and bolt hole, drilled horizontally to meet bottom of the vertical holes. Based on this information, the subject design change will not affect the form, fit or function of the TC top flange or the flange to top cover plate joint interface, is not detrimental to the structural integrity of the TC and will not adversely affect the ability of the TC to perform it's intended design function. This design change enhanced TC design, in that, it reduces the potential for the relief holes to become contaminated. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Consequences of Malfunction:</u>

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

<u>Probability of Accident:</u>

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the top flange relief holes threading design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

<u>Consequences of Accident:</u>

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the top flange relief holes threading design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Relief Holes Threading			72.48 Log No.: SE00040	
D3-TC-8; 37/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity added threads to the relief holes in the TC top flange to allow them to be plugged when the cask is immersed in the fuel pool. This helps ease the decontamination of the top cover bolt holes before installation of the cover. Based on this information, the subject design change will not affect the form, fit or function of the TC top flange or the flange to top cover plate joint interface, is not detrimental to the structural integrity of the TC and will not adversely affect the ability of the TC to perform it's intended design function. This design change enhanced TC design, in that, it reduces the potential for the relief holes to become contaminated. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a top flange relief holes threading design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The top flange relief holes threading design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Relief Holes Threading			72.48 Log No.: SE00040	
D3-TC-8; 37/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) top flange.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shell Weld Process Design Change			72.48 Log No.: SE00041
D3-TC-9; 38/129; ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved | Approved Disapproved

Signature: [signature] Jon N. Woodfield Signature: Michael J. Gahan
INDEPENDENT REVIEWER | for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11-24-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shell Weld Process Design Change				72.48 Log No.: SE00041
D3-TC-9; 38/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) structural shell weld process.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shell Weld Process Design Change			72.48 Log No.: SE00041	
D3-TC-9; 38/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the shell weld process design change. The subject activity allowed the use of automatic submerged arc weld process for weldments between structural shell and forgings, with proper protection of the heat affected zone. The other allowed welding methods were gas tungsten arc and gas metal arc. The reason for this change is to facilitate fabrication of the TC shell. Welds made by the submerged-arc process are found to have uniformly high quality, good ductility, high density, high impact strength, and good corrosion resistance. Mechanical properties of the weld are consistently as good as the base metal. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC structural shell, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the design properties of the cask or the weld joints. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the shell weld process design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the shell weld process design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shell Weld Process Design Change			72.48 Log No.: SE00041	
D3-TC-9; 38/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity allowed the use of automatic submerged arc weld process for weldments between structural shell and forgings, with proper protection of the heat affected zone. The reason for this change is to facilitate fabrication of the TC shell. Welds made by the submerged-arc process are found to have uniformly high quality, good ductility, high density, high impact strength, and good corrosion resistance. Mechanical properties of the weld are consistently as good as the base metal. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC structural shell, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the design properties of the cask or the weld joints. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a shell weld process design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The shell weld process design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shell Weld Process Design Change			72.48 Log No.: SE00041	
D3-TC-9; 38/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) structural shell weld process.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Location Hole Depth Design Change	72.48 Log No.: SE00042
D3-TC-10; 39/129; ES199601368 Supplement 001 Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER
Date 11/12/97

Approved Disapproved
Signature: Michael J. Gahan
for ~~CS-DES~~ CS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11-24-97

Recommend Approval ✓ Recommend Disapproval ________ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ________ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ________ No X

Signature: J R Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ________________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Location Hole Depth Design Change			72.48 Log No.: SE00042	
D3-TC-10; 39/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) top flange location pin hole.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Location Hole Depth Design Change			72.48 Log No.: SE00042	
D3-TC-10; 39/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the top flange location hole depth design change. The subject activity changed the length of the location pin hole at the 185 degree azimuth from 1.75" to 2.75" (see drawing 84-022-E). This depth is now consistent with the depth of the location pin hole at the 5 degree azimuth. The reason for this change is to assure adequate depth of the location pin, and to maintain consistency with the depth of the other location pin hole, since the hole at 5 degree azimuth was already designed for 2.75" with a water relief hole at the end of the pin hole. This change does not change the structural adequacy of the cask. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC top flange, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the lifting or positioning of the transfer cask. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the top flange location hole depth design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the top flange location hole depth design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Location Hole Depth Design Change			72.48 Log No.: SE00042	
D3-TC-10; 39/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

<u>Possibility of New Malfunction:</u>

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed the length of the location pin hole at the 185 degree azimuth to 2.75". This depth is now consistent with the depth of the location pin hole at the 5 degree azimuth. The reason for this change is to assure adequate depth of the location pin, and to maintain consistency with the depth of the other location pin hole, since the hole at 5 degree azimuth was already designed for 2.75" with a water relief hole at the end of the pin hole. This change does not change the structural adequacy of the cask. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC top flange, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. This design change does not affect the lifting or positioning of the transfer cask. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

<u>Possibility of New Accident:</u>

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

<u>Complete for 50.59 and 72.48:</u>

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

<u>Bases</u> <u>Discussion of why the margin of safety is not reduced</u>

None of the Technical Specifications nor the Bases are affected by this activity.

<u>Complete for 72.48:</u>

NO Will the proposed activity involve a significant increase in occupational dose?

<u>A significant increase in occupational dose:</u>

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a top flange location hole depth design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The top flange location hole depth design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

<u>A significant unreviewed environmental impact:</u>

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Flange Location Hole Depth Design Change			72.48 Log No.: SE00042	
D3-TC-10; 39/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) top flange location pin hole.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of TC Lead Casting Full Surface Requirement				72.48 Log No.: SE00043
D3-TC-12; 40/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11.24.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of TC Lead Casting Full Surface Requirement			72.48 Log No.: SE00043	
D3-TC-12; 40/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) lead shielding inspection requirement.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of TC Lead Casting Full Surface Requirement	72.48 Log No.: SE00043
D3-TC-12; 40/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the deletion of the lead casting full surface requirement design change. The subject design change deleted the requirement that the lead casting have full surface contact with the structural shell to facilitate fabrication and pouring of the TC lead shielding. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Full surface contact between the lead casting and the cask shell is neither necessary nor detectable, since any gap between the lead and the shell would not form a streaming path due to the geometry of the cask. The gamma scan required by the fabrication specification ensures that full shielding thickness is obtained. This change therefore does not affect the design or operation of the cask, and does not impact any safety or licensing criteria. Based on the above information, the subject design change will not have a detrimental impact on the integrity or shielding capability of the TC. The subject design change will not affect the form, fit or function of the lead shielding and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the deletion of the lead casting full surface requirement design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of TC Lead Casting Full Surface Requirement			72.48 Log No.: SE00043	
D3-TC-12; 40/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the deletion of the lead casting full surface requirement design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject design change deleted the requirement that the lead casting have full surface contact with the structural shell to facilitate fabrication and pouring of the TC lead shielding. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Full surface contact between the lead casting and the cask shell is neither necessary nor detectable, since any gap between the lead and the shell would not form a streaming path due to the geometry of the cask. The gamma scan required by the fabrication specification ensures that full shielding thickness is obtained. This change therefore does not affect the design or operation of the cask, and does not impact any safety or licensing criteria. Based on the above information, the subject design change will not have a detrimental impact on the integrity or shielding capability of the TC. The subject design change will not affect the form, fit or function of the lead shielding and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved the deletion of the lead casting full surface requirement. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The deletion of the lead casting full surface requirement design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1, since the gamma scan required by the fabrication specification ensured that full shielding thickness was obtained.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of TC Lead Casting Full Surface Requirement			72.48 Log No.: SE00043	
D3-TC-12; 40/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) lead shielding inspection requirement.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Neutron Shield Panel Tolerance Design Change			72.48 Log No.: SE00044	
D3-TC-13; 41/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11·7·97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: Jon N. Woodfield [signature]
INDEPENDENT REVIEWER
Date 11/12/97

Approved Disapproved
Signature: Michael J. Gahan [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11·24·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Neutron Shield Panel Tolerance Design Change			72.48 Log No.: SE00044	
D3-TC-13; 41/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) upper neutron shield panel support ring.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Neutron Shield Panel Tolerance Design Change			72.48 Log No.: SE00044	
D3-TC-13; 41/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the upper neutron shield panel support ring tolerance design change. The subject activity loosened the tolerance on the placement of the upper neutron shield panel support ring from +/- 0.06" to +/- 0.12" (see drawings 84-018-E and 84-025-E). The purpose of the old tolerance was to prevent an interference of the weld between the supporting ring and the structural shell with the access port cover. This purpose is now achieved by adding a note to the weldment requiring the weld to be a 5/16" seal weld only where adjacent to access hole cover. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC shell, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC/upper neutron shield panel support ring from performing their intended design functions. There is no detrimental operational impact associated with this design change. Additionally, the revised tolerance dimensions will not create any component assembly interference. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the upper neutron shield panel support ring tolerance design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Neutron Shield Panel Tolerance Design Change			72.48 Log No.: SE00044	
D3-TC-13; 41/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the upper neutron shield panel support ring tolerance design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity loosened the tolerance on the placement of the upper neutron shield panel support ring from +/- 0.06" to +/- 0.12". The purpose of the old tolerance was to prevent an interference of the weld between the supporting ring and the structural shell with the access port cover. This purpose is now achieved by adding a note to the weldment requiring the weld to be a 5/16" seal weld only where adjacent to access hole cover. The subject change meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). Based on this information, the subject design change will not affect the form, fit or function of the TC shell, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC/upper neutron shield panel support ring from performing their intended design functions. There is no detrimental operational impact associated with this design change. Additionally, the revised tolerance dimensions will not create any component assembly interference. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a upper neutron shield panel support ring tolerance design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The upper neutron shield panel support ring tolerance design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Neutron Shield Panel Tolerance Design Change			72.48 Log No.: SE00044	
D3-TC-13; 41/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) upper neutron shield panel support ring.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Cover Plate Material Design Change			72.48 Log No.: SE00045	
D3-TC-14; 42/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved — Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER
Date 11/12/97

Signature: [signature]
for ~~GS-DES, GS-TES~~, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11-24-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Cover Plate Material Design Change	72.48 Log No.: SE00045
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) top cover plate.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Cover Plate Material Design Change			72.48 Log No.: SE00045	
D3-TC-14; 42/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the top cover plate material design change. The subject activity changed the material for the TC top cover plate from carbon steel ASTM A516 Gr 70 with stainless steel ASTM A240 Type 304 to reduce the probability of corrosion of the top cover plate and improve the overall operability of the cask (see drawing 84-027-E). The structural impact of the change is negligible and justified in calculation BGE001.0202 revision 4. The change in material results in a negligible effect on the dead weight (0.286 vs. 0.283 lbs./cu.ft.). For the static analysis performed, the reduction in Modulus of Elasticity E (26.5E6 vs. 27.7 E6) and the increased coefficient of thermal expansion (9.80 E-6 vs. 7.60 E-6) resulted in a reduction of the calculated stresses. Based on this information, the subject design change will not affect the form, fit or function of the TC top cover plate, is not detrimental to the structural integrity of the TC or the top plate joint interface, and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the top cover plate material design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the top cover plate material design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Cover Plate Material Design Change			72.48 Log No.: SE00045	
D3-TC-14; 42/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed the material for the TC top cover plate from carbon steel ASTM A516 Gr 70 with stainless steel ASTM A240 Type 304 to reduce the probability of corrosion of the top cover plate and improve the overall operability of the cask. The structural impact of the change is negligible and justified in calculation BGE001.0202 revision 4. Based on this information, the subject design change will not affect the form, fit or function of the TC top cover plate, is not detrimental to the structural integrity of the TC or the top plate joint interface, and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a top cover plate material design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The top cover plate material design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Top Cover Plate Material Design Change			72.48 Log No.: SE00045	
D3-TC-14; 42/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) top cover plate.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Alignment Mounting Holes				72.48 Log No.: SE00046
D3-TC-15; 43/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved (circled) Disapproved | Approved (circled) Disapproved

Signature: Jon N. Woodfield Jon N. Woodfield Signature: Michael J. Gahan
INDEPENDENT REVIEWER | for ~~GS-DES~~, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11-24-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Alignment Mounting Holes			72.48 Log No.: SE00046	
D3-TC-15; 43/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask).

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Alignment Mounting Holes			72.48 Log No.: SE00046	
D3-TC-15; 43/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the alignment mounting holes design change. The subject activity added mounting holes to provide locations for mounting the cask alignment targets (see drawings 84-027-E and 84-029-E). The structural integrity of the cask is not affected. Based on this information, this activity will not affect the form, fit or function of the TC, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. There is no detrimental operational impact associated with this design change. Additionally, this design change will not create any component assembly interference. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the alignment mounting holes design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the alignment mounting holes design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Alignment Mounting Holes			72.48 Log No.: SE00046	
D3-TC-15; 43/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity added mounting holes to provide locations for mounting the cask alignment targets. The structural integrity of the cask is not affected. Based on this information, this activity will not affect the form, fit or function of the TC, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. There is no detrimental operational impact associated with this design change. Additionally, this design change will not create any component assembly interference. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a alignment mounting holes design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The alignment mounting holes design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Alignment Mounting Holes			72.48 Log No.: SE00046	
D3-TC-15; 43/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask).

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Plate Weld Surface Finish Requirements Clarification				72.48 Log No.: SE00047
D3-TC-16; 44/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved (circled) Disapproved — Approved (circled) Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER
Date 11/12/97

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11-24-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Plate Weld Surface Finish Requirements Clarification			72.48 Log No.: SE00047	
D3-TC-16; 44/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) surface finish requirements for the top cover plate welds.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Plate Weld Surface Finish Requirements Clarification			72.48 Log No.: SE00047	
D3-TC-16; 44/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the surface finish requirements design change. The subject activity clarified the surface finish requirements of the TC top cover welds for fabrication purposes. Essentially, all exposed external cask, interior cavity, and top and bottom cover plate assembly surfaces shall be finished to 63 (micro) inch RMS or better (see drawing 84-028-E). Plate surfaces which will not be exposed to pool water shall have an ASTM A480 No. 1 or 250 (micro) inch RMS finish. Top cover plate assembly welds are not exposed to the spent fuel pool and need not meet surface finish requirements. These welds shall be ground to permit NDE as required. The subject clarification of the TC top cover plate weld surface finish meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). These welds are not exposed to the pool and therefore need only be ground as required for NDE. This change does not affect the cask design basis. Based on this information, the subject surface finish requirement clarification will not affect the form, fit or function of the TC or the TC top cover plate, is not detrimental to the structural integrity of the TC and will not adversely affect the ability of the TC to perform it's intended design function. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the surface finish requirements design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Plate Weld Surface Finish Requirements Clarification			72.48 Log No.: SE00047
D3-TC-16; 44/129;	ES199601368	Supplement 001 Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the surface finish requirements design change, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity clarified the surface finish requirements of the TC top cover welds for fabrication purposes. The subject clarification of the TC top cover plate weld surface finish meets the original design requirements as established by Pacific Nuclear Fuel Services (PNFS). These welds are not exposed to the pool and therefore need only be ground as required for NDE. This change does not affect the cask design basis. Based on this information, the subject surface finish requirement clarification will not affect the form, fit or function of the TC or the TC top cover plate, is not detrimental to the structural integrity of the TC and will not adversely affect the ability of the TC to perform it's intended design function. There is no detrimental operational impact associated with this design change. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a surface finish requirements design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The surface finish requirements design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Plate Weld Surface Finish Requirements Clarification			**72.48 Log No.: SE00047**	
D3-TC-16; 44/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 5 of 5**

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) surface finish requirements for the top cover plate welds.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Material Design Change			72.48 Log No.: SE00048	
D3-TC-17; 45/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved Approved Disapproved

Signature: [signature] Jon N. Woodfield Signature: Michael J. Gahan
INDEPENDENT REVIEWER for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11·24·97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Material Design Change			72.48 Log No.: SE00048	
D3-TC-17; 45/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) shield plug plate material.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Material Design Change			72.48 Log No.: SE00048	
D3-TC-17; 45/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the shield plug plate material design change. The subject activity allowed the use of ASTM A36 or A516 Gr 70 in place of ASTM A283 Grade C plate in the shield plug assembly to provide flexibility in shield plug fabrication (see drawing 84-030-E). The alternate materials are acceptable since they have equal or better allowable stresses, and since the assembly plates are essentially unstressed in this application. This is an acceptable practice to use materials of comparable properties. All three are carbon steels. A36 is a primary structural steel ($F_y = 36$ ksi), A516 is a pressure vessel steel ($F_y = 38$ ksi), and A283 is a low tensile strength carbon steel ($F_y = 30$ ksi). The temporary shield plug assembly is non-safety related. Based on this information, changing the subject temporary shield plug assembly material will not affect the form, fit or function of the TC temporary shield plug, is not detrimental to the structural integrity of the TC or the shield plug, and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the shield plug plate material design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the shield plug plate material design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Material Design Change	72.48 Log No.: SE00048
D3-TC-17; 45/129; ES199601368 Supplement 001 Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity allowed the use of ASTM A36 or A516 Gr 70 in place of ASTM A283 Grade C plate in the shield plug assembly to provide flexibility in shield plug fabrication. The alternate materials are acceptable since they have equal or better allowable stresses, and since the assembly plates are essentially unstressed in this application. Based on this information, changing the subject temporary shield plug assembly material will not affect the form, fit or function of the TC temporary shield plug, is not detrimental to the structural integrity of the TC or the shield plug, and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a shield plug plate material design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The shield plug plate material design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Material Design Change			72.48 Log No.: SE00048	
D3-TC-17; 45/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) shield plug plate material.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Width Tolerance Design Change			72.48 Log No.: SE00049	
D3-TC-18; 46/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-134 Date: 11·24·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-24-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 11/25/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Width Tolerance Design Change			72.48 Log No.: SE00049	
D3-TC-18; 46/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) shield plug.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Width Tolerance Design Change	72.48 Log No.: SE00049
D3-TC-18; 46/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the shield plug tolerance design change. The subject activity relaxed the tolerance requirements on the width of the shield plug assembly inner plug (was +/- .03", now +/- .06"), inner plug support bracket (was 5.00" +/- .03" now "to be free sliding"), and inner diameter of outer plug (was +/- .06", now +/- .12") (see drawing 84-030-E). The reason for this design change was to provide flexibility in shield plug fabrication. The new tolerances are consistent with the functional requirements of the components. The prime consideration is that the components fit together without binding. The shield plug assembly is non-safety related. Based on this information, changing the subject temporary shield plug tolerances will not affect the form, fit or function of the TC temporary shield plug, is not detrimental to the structural integrity of the TC or the shield plug, and will not adversely affect the ability of the TC to perform it's intended design function. Additionally, the revised clearance dimensions will not create any component assembly interference. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the shield plug tolerance design change does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the shield plug tolerance design change, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Width Tolerance Design Change				72.48 Log No.: SE00049
D3-TC-18; 46/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity relaxed the tolerance requirements on the width of the shield plug assembly inner plug, inner plug support bracket, and inner diameter of outer plug. The reason for this design change was to provide flexibility in shield plug fabrication. The new tolerances are consistent with the functional requirements of the components. The prime consideration is that the components fit together without binding. The shield plug assembly is non-safety related. Based on this information, changing the subject temporary shield plug tolerances will not affect the form, fit or function of the TC temporary shield plug, is not detrimental to the structural integrity of the TC or the shield plug, and will not adversely affect the ability of the TC to perform it's intended design function. Additionally, the revised clearance dimensions will not create any component assembly interference. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a shield plug tolerance design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The shield plug tolerance design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1. This design change did not reduce the lead shielding thickness nor did it alter the shielding capability of the TC. Therefore, this subject design change will not decrease the shielding requirements/ability of the TC.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Shield Plug Width Tolerance Design Change			72.48 Log No.: SE00049	
D3-TC-18; 46/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the TC (Transfer Cask) shield plug.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Minimum Shell Thickness Non Conformance				72.48 Log No.: SE00050
D4-TC-1; 47/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for ~~GS-DES~~, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Minimum Shell Thickness Non Conformance			72.48 Log No.: SE00050	
D4-TC-1; 47/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Minimum Shell Thickness Non Conformance			72.48 Log No.: SE00050	
D4-TC-1; 47/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the minimum shell thickness non conformance. The subject non conformance (Sulzer Bingham NCR No. 108826) identifies the TC structural shell as-built plate average thickness to be 1.459" at one of thirty-four measured areas. The minimum allowable thickness of 1.490" was not met. Calculation BGE001.0202, revision 4, shows that the maximum calculated stress versus allowable for the transfer cask structural shell occurs for the Level A Cases 1 through 5 load combinations. The corresponding maximum calculated stress is 55.8 ksi with an allowable of 56.1 ksi. The SA 240 Type 304 plate material for the structural shell has a yield strength of 42.5 ksi and a tensile strength of 89.0 ksi at room temperature, as determined by a CMTR (Certified Material Test Report). This compares with the ASME code minimum values for yield strength of 30 ksi and a tensile strength of 75 ksi used for design.

The Code allowable stress intensity for the plate materials is proportional to the material strength properties. Conservatively assuming that the increased stress in the reduced plate section is resisted entirely by bending, and that the bending stress is inversely proportional to the square of the plate thickness, the minimum acceptable material thickness is determined as follows:

$\{(tmin) / (1.50)\}^2 = \{S_{design} / S_{actual}\}$

$t_{min} >/= 1.50 \{30.0 / 42.5\}^{1/2}$

$t_{min} >/=$ 1.26 inches

Substituting based on tensile strength:

$t_{min} >/= 1.50\{75 / 89\}^{1/2}$

$t_{min} >/=$ 1.38 inches

Since the actual thickness of the structural shell exceeds the minimum required thickness, the structural shell is acceptable as is. The reduced shell thickness has a negligible affect on the thermal and shielding calculations. A review of the calculation showed that the design was based on a shell thickness of 1.50", not the minimum required 1.490". However, there are several cases throughout the calculations that the expected loads were conservatively increased (a common practice in design). For example, the total design weight of the transfer cask and DSC is 200k, versus an estimated absolute worst case actual weight of 188.5k. In addition, the transfer cask analytical models were developed and analyzed using a carbon steel SA 516 Gr. 70 shell. The fabricator elected to use a stainless steel SA 240 Type 304 shell. This resulted in lower calculated stresses. Also, the minimum average value of 1.459" was only found in one of thirty-four measured areas. All other areas measured at least 1.472". Based on the above information, the subject non conformance will not affect the form, fit or function of the TC shell, is not detrimental to the structural integrity of the TC and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Minimum Shell Thickness Non Conformance				72.48 Log No.: SE00050
D4-TC-1; 47/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the minimum shell thickness non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the minimum shell thickness non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the TC structural shell as-built plate thickness to be 1.459". The minimum allowable thickness of 1.490" was not met. The minimum acceptable material thickness was then calculated to be 1.38", which exceeds the minimum required thickness, thus the structural shell is acceptable as is. Based on the above information, the subject non-conformance will not affect the form, fit or function of the TC shell, is not detrimental to the structural integrity of the TC and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this activity has no detrimental impact on equipment important to safety, and does not create the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases   Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Minimum Shell Thickness Non Conformance			72.48 Log No.: SE00050	
D4-TC-1; 47/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a minimum shell thickness non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The minimum shell thickness non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell Maximum Lead Thickness Non Conformance				72.48 Log No.: SE00051
D4-TC-2; 48/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11·26·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell Maximum Lead Thickness Non Conformance	72.48 Log No.: SE00051
D4-TC-2; 48/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell Maximum Lead Thickness Non Conformance			72.48 Log No.: SE00051	
D4-TC-2; 48/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the maximum lead thickness non conformance. The subject non conformance (Sulzer Bingham NCR No. 108831) identifies the TC lead cavity exceeding the maximum allowable thickness. The maximum measured thickness is 4.138" while the maximum allowable is 4.12". A slight increase in the transfer cask weight will result from the increased lead cavity thickness. Calculation BGE001.0202, Revision 4, is based on a total weight of 200 kips. The actual weight of the transfer cask plus the DSC (dry) is 180 kips. The 20 kip weight margin is more than adequate to accommodate the increased lead thickness. Also, the average lead cavity thickness is within the nominal design thickness. The transfer cask is therefore structurally adequate. The thickness increase has a negligible effect on the transfer cask thermal calculations and a positive effect on the shielding calculations. The estimated absolute worst case actual weight is 188.5k, which occurs during the critical vertical handling condition at the spent fuel pool. The 180k referenced above occurs with the cask loaded with the DSC and fuel assemblies during transfer. Still, the design is more than adequate even with the increased lead cavity thickness. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC shell, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the maximum lead thickness non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell Maximum Lead Thickness Non Conformance			**72.48 Log No.: SE00051**	
D4-TC-2; 48/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 4 of 5**

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the maximum lead thickness non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the TC lead cavity exceeding the maximum allowable thickness. The maximum measured thickness is 4.138" while the maximum allowable is 4.12". The thickness increase has a negligible effect on the transfer cask structural and thermal calculations, and a positive effect on the shielding calculations. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC shell, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this activity has no detrimental impact on equipment important to safety, and does not create the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a maximum lead thickness non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The maximum lead thickness non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell Maximum Lead Thickness Non Conformance			72.48 Log No.: SE00051	
D4-TC-2; 48/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Flange Maximum Bore Diameter Non Conformance				72.48 Log No.: SE00052
D4-TC-3; 49/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved — Approved Disapproved

Signature: Jon N. Woodfield Jon N. Woodfield — Signature: Michael J. Gahan
INDEPENDENT REVIEWER — for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 — Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ________ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ________ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ________ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Flange Maximum Bore Diameter Non Conformance			72.48 Log No.: SE00052	
D4-TC-3; 49/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) top flange identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Flange Maximum Bore Diameter Non Conformance			72.48 Log No.: SE00052	
D4-TC-3; 49/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the maximum bore diameter non conformance. The subject non conformance (Sulzer Bingham NCR No. 108834) identifies the maximum bore dimension of the TC cask top flange as 69.654" while the maximum allowable is 69.58". The oversize condition evidently resulted from shrinkage of the flange to shell weldment which caused an axisymmetric rotation of the flange about its centerline. The flange became slightly conical with an included angle of about 1 degree, so that it is slightly bell mouthed. The slight increase in maximum flange diameter will not affect the ability of the annulus seal to perform its function, and has no impact on any other cask design condition. The bore dimension is shown to be 69.55 +/- 0.03". Thus, the variance is only 0.074". Since the flange ring is 5.48" wide, this variance will not affect the annulus seal. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC shell or the top flange, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC annulus seal to perform its intended design function. Additionally, the subject justification will not create any component assembly interference. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the maximum bore diameter non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Flange Maximum Bore Diameter Non Conformance			72.48 Log No.: SE00052	
D4-TC-3; 49/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

has not changed as a result of the maximum bore diameter non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the maximum bore diameter non conformance. The slight increase in maximum flange diameter will not affect the ability of the annulus seal to perform its function, and has no impact on any other cask design condition. The bore dimension is shown to be 69.55 +/- 0.03". Thus, the variance is only 0.074". Since the flange ring is 5.48" wide, this variance will not affect the annulus seal. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC shell or the top flange, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC annulus seal to perform its intended design function. Additionally, the subject justification will not create any component assembly interference. Therefore, this activity has no detrimental impact on equipment important to safety, and does not create the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a maximum bore diameter non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The maximum bore diameter non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Top Flange Maximum Bore Diameter Non Conformance			72.48 Log No.: SE00052	
D4-TC-3; 49/129;	ES199601368	Supplement 001	Revision 0000	

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) top flange identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Pour Preheat Non Conformance				72.48 Log No.: SE00053
D4-TC-4; 50/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved Approved Disapproved

Signature: Jon N. Woodfield - Jon N. Woodfield Signature: Michael J. Gahan
INDEPENDENT REVIEWER for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11·26·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Pour Preheat Non Conformance			72.48 Log No.: SE00053	
D4-TC-4; 50/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Pour Preheat Non Conformance			72.48 Log No.: SE00053	
D4-TC-4; 50/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the maximum shell preheat temperature non conformance. The subject non conformance (Sulzer Bingham NCR No. 109612) occurred during the preheat of the cask prior to the lead pour in which the area around the trunnions exceeded the maximum temperature of 725°F to a temperature of 880°F for approximately one hour. The shell material that experienced the temperature excursion is ASME SA Grade 304 with an actual carbon content of 0.058%. Per the Committee of Stainless Steel Producers of AISI, a time of 10 hours at a temperature of 500°C. (932°F) would be needed to form harmful amounts of chromium carbides. Since the actual temperature excursion was approximately one hour at 880°F, the time at temperature was insufficient to sensitize the material. The maximum temperature was observed about four inches from the trunnions. The actual ramp-up from 750°F to 880°F was quite rapid, about 15 minutes in duration, with an exposure of 30 minutes over 800°F and a total exposure of 1 hour and 50 minutes over 725 degrees F. It is not known what temperature was reached directly at the trunnion. It is known that the trunnion saw direct flame impingement during the 880°F temperature and that the high temperatures were only in the area of the trunnion. It is therefore likely that the trunnion was exposed to an even greater temperature. A sample was removed from the trunnion and tested for sensitization. The test confirmed that a condition of sensitization does not exist on the surface of the trunnion sleeve exposed to the elevated temperature. The material is therefore acceptable for use. The cask design is not otherwise affected by the temperature excursion. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC shell or the trunnions, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the maximum shell preheat temperature non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Pour Preheat Non Conformance			72.48 Log No.: SE00053	
D4-TC-4; 50/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the maximum shell preheat temperature non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance occurred during the preheat of the cask prior to the lead pour in which the area around the trunnions exceeded the maximum temperature of 725°F to a temperature of 880°F for approximately one hour. It is not known what temperature was reached directly at the trunnion. It is known that the trunnion saw direct flame impingement during the 880°F temperature and that the high temperatures were only in the area of the trunnion. It is therefore likely that the trunnion was exposed to an even greater temperature. A sample was removed from the trunnion and tested for sensitization. The test confirmed that a condition of sensitization does not exist on the surface of the trunnion sleeve exposed to the elevated temperature. The material is therefore acceptable for use. The cask design is not otherwise affected by the temperature excursion. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC shell or the trunnions, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety, and does not create the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a maximum shell preheat temperature non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The maximum shell preheat temperature non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Pour Preheat Non Conformance	72.48 Log No.: SE00053
D4-TC-4; 50/129; ES199601368 Supplement 001 Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Silver Content Non Conformance				72.48 Log No.: SE00054
D4-TC-5; 51/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11·7·97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES/GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11·26·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Silver Content Non Conformance			72.48 Log No.: SE00054	
D4-TC-5; 51/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) lead identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Silver Content Non Conformance			72.48 Log No.: SE00054	
D4-TC-5; 51/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the lead silver content non conformance. The subject non conformance (Sulzer Bingham NCR No. 109705) states that the measured silver content in the cask lead was less than 0.001%. ASTM B29, Chemical Grade requires silver content between 0.002% and 0.02%. The minimum reported lead content of 99.93% is greater than the 99.90% required by the specification. The shielding properties of the lead are not affected by the absence of trace silver. This deviation is therefore acceptable and has no impact on the cask design. ASTM B29 is the standard specification for pig lead, which is refined lead in pig form. Pig is defined in the specification as an oblong or square mass of metal that has been cast while still molten into a mold that gives the metal its particular shape. Based on the above information and review of design drawings, the subject non-conformance will not affect the form, fit or function of the TC, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the lead silver content non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the lead silver content non conformance, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Silver Content Non Conformance			72.48 Log No.: SE00054	
D4-TC-5; 51/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance states that the measured silver content in the cask lead was less than 0.001%. ASTM B29, Chemical Grade requires silver content between 0.002% and 0.02%. The minimum reported lead content of 99.93% is greater than the 99.90% required by the specification. The shielding properties of the lead are not affected by the absence of trace silver. This deviation is therefore acceptable and has no impact on the cask design. Based on the above information and review of design drawings, the subject non-conformance will not affect the form, fit or function of the TC, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform it's intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a lead silver content non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The lead silver content non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Lead Silver Content Non Conformance			72.48 Log No.: SE00054	
D4-TC-5; 51/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) lead identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell O.D. Maximum Temperature Non Conformance			72.48 Log No.: SE00055
D4-TC-6; 52/129;	ES199601368	Supplement 001	Revision 0000 Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved — Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Signature: Michael J. Gahan
for ~~GS-DES~~, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemone Date: 1/30/98
~~OSSRC~~ SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell O.D. Maximum Temperature Non Conformance	72.48 Log No.: SE00055
D4-TC-6; 52/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell O.D. Maximum Temperature Non Conformance			72.48 Log No.: SE00055	
D4-TC-6; 52/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the shell O.D. maximum temperature non conformance. The subject non conformance (Sulzer Bingham NCR No. 109731) identifies the temperature on the cask shell O.D. exceeding the maximum allowable of 725°F at several times during the lead pour operations. The maximum temperatures and durations are:

Location	°F	Duration (hrs)
1	750	5.00
2	760	5.00
3	765	5.00
4	760	1.17
5	740	1.17
6	730	1.25
7	733	1.50
8	730	1.00
9	730	1.00
10	730	1.00
11	730	1.00
12	730	1.92
13	740	3.75
14	780	1.75
15	750	5.00
16	740	1.08
17	735	1.75
18	740	1.00
19	730	1.00

The shell material that experienced the temperature excursion is ASME SA240, GR 304 with an actual carbon content of 0.058% on the lower shell and 0.039% on the upper shell. The times for which the cask temperatures exceeded the limits set by the procedure were insufficient to sensitize the material. Per the Committee of Stainless Steel Producers of AISI, for a worst case of 800°F for sixteen hours, with the given carbon content, there is no condition of sensitization of the material. The material is therefore acceptable for use. The cask design is not otherwise affected by the temperature excursion. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC shell O.D., is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell O.D. Maximum Temperature Non Conformance				72.48 Log No.: SE00055
D4-TC-6; 52/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the shell O.D. maximum temperature non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the shell O.D. maximum temperature non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the temperature on the cask shell O.D. exceeding the maximum allowable of 725°F at several times during the lead pour operations. The times for which the cask temperatures exceeded the limits set by the procedure were insufficient to sensitize the material. Per the Committee of Stainless Steel Producers of AISI, for a worst case of 800°F for sixteen hours, with the given carbon content, there is no condition of sensitization of the material. The material is therefore acceptable for use. The cask design is not otherwise affected by the temperature excursion. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC shell O.D., is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety, and does not create the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Shell O.D. Maximum Temperature Non Conformance			72.48 Log No.: SE00055	
D4-TC-6; 52/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a shell O.D. maximum temperature non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The shell O.D. maximum temperature non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Inner Liner I.D. Maximum Temperature Non Conformance			72.48 Log No.: SE00056	
D4-TC-7; 53/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Tom N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11·26·97

Recommend Approval ✓ Recommend Disapproval ________ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ________ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ________ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Inner Liner I.D. Maximum Temperature Non Conformance			72.48 Log No.: SE00056	
D4-TC-7; 53/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) inner liner identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the inner liner I.D. maximum temperature non conformance. The subject non conformance (Sulzer Bingham NCR No. 109732) identifies the temperature on the inner liner I.D. exceeding the maximum allowable of 725°F at several times during the lead pour operations. The maximum temperatures and durations are:

Location	°F	Duration (mins)
1	770	10
2	770	25
3	750	5
4	825	10
5	860	5
6	810	20
7	800	10
8	780	10
9	770	30
10	790	30
11	760	30
12	750	25
13	740	30
14	740	30
15	810	15
16	740	75
17	770	15

The inner liner material that experienced the temperature excursion is ASME SA240, GR 304 with an actual carbon content of 0.058%. The times for which the cask temperatures exceeded the limits set by the procedure were insufficient to sensitize the material. Per the Committee of Stainless Steel Producers of AISI, for a worst case of 860°F for ninety minutes, with the given carbon content, there is no condition of sensitization of the material. The material is therefore acceptable for use. The cask design is not otherwise affected by the temperature excursion. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC inner liner I.D., is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Inner Liner I.D. Maximum Temperature Non Conformance			72.48 Log No.: SE00056	
D4-TC-7; 53/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the inner liner I.D. maximum temperature non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the inner liner I.D. maximum temperature non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the temperature on the inner liner I.D. exceeding the maximum allowable of 725°F at several times during the lead pour operations. The times for which the cask temperatures exceeded the limits set by the procedure were insufficient to sensitize the material. Per the Committee of Stainless Steel Producers of AISI, for a worst case of 860°F for ninety minutes, with the given carbon content, there is no condition of sensitization of the material. The material is therefore acceptable for use. The cask design is not otherwise affected by the temperature excursion. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC inner liner I.D., is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety, and does not create the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Inner Liner I.D. Maximum Temperature Non Conformance				72.48 Log No.: SE00056
D4-TC-7; 53/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a inner liner I.D. maximum temperature non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The inner liner I.D. maximum temperature non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) inner liner identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Minimum Lead Thickness Non Conformance			72.48 Log No.: SE00057
D4-TC-8; 54/129;	ES199601368 Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved | Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER
Date 11/12/97

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: J B Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Minimum Lead Thickness Non Conformance			72.48 Log No.: SE00057	
D4-TC-8; 54/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Minimum Lead Thickness Non Conformance			72.48 Log No.: SE00057	
D4-TC-8; 54/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the minimum lead thickness non conformance. The subject non conformance (Sulzer Bingham NCR No. 110603) identifies that the as-poured cask lead thickness is less than the allowable in some locations. The minimum measured lead thickness is 3.845", which is less than the minimum allowable thickness of 3.880". The effect of the below tolerance lead shielding is analyzed in calculation BGE001.0616, revision 0. This calculation determined that under worst case conditions the maximum cask surface dose rate in the localized areas where the lead thickness is below the minimum required is 106 mrem/hr., as opposed to the nominal 85 mrem/hr. for the remainder of the cask site surface. Since the surface area where the lead thickness is below the minimum required is less than 0.6% of the total cask surface area, this increase will not significantly increase occupational exposure. This deviation therefore has a minimal impact on the cask design and is acceptable. A review of calculation BGE001.0616 revealed that the cask was designed so that the cask surface dose rate was less than 100 mrem/hr. A computer model (ANISN) was used to compute the maximum cask surface dose rate. Several assumptions were made and documented in the calculation to help maximize the dose rate. It is very unlikely these assumptions would all come true at once, so that the realistic maximum cask surface dose rate will be less than 100 mrem/hr. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC lead shield, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the minimum lead thickness non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the minimum lead thickness non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies that the as-poured cask lead thickness is less than the allowable in some locations. The minimum measured lead thickness is 3.845", which is less than the minimum allowable thickness of 3.880". The effect of the below tolerance lead shielding is analyzed in calculation BGE001.0616, revision 0. This calculation determined that under worst case conditions the maximum cask surface dose rate in the localized areas where the lead thickness is below the minimum required is 106 mrem/hr., as opposed to the nominal 85 mrem/hr. for the remainder of the cask site surface. Since the surface area where the lead thickness is below the minimum required is less than 0.6% of the total cask surface area, this increase will not significantly increase occupational exposure. This deviation therefore has a minimal impact on the cask design and is acceptable. A review of calculation BGE001.0616 revealed that the cask was designed so that the cask surface dose rate was less than 100 mrem/hr. A computer model (ANISN) was used to compute the maximum cask surface dose rate. Several assumptions were made and documented in the calculation to help maximize the dose rate. It is very unlikely these assumptions would all come true at once, so that the realistic maximum cask surface dose rate will be less than 100 mrem/hr. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC lead shield, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety, and does not create the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Minimum Lead Thickness Non Conformance	72.48 Log No.: SE00057
D4-TC-8; 54/129; ES199601368 Supplement 001 Revision 0000	Page 5 of 5

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a minimum lead thickness non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. A comparison was made between actual occupational dose received during decontaminating the outer surface of the cask (while located in the cask washdown pit), and the estimated occupational exposure (dose) in Table 7.4-1 of the ISFSI USAR. This comparison revealed that the estimated dose for this activity (as referenced in the SAR) was greater than the actual dose received during performance of this activity. This comparison indicates that the small decrease in the TC lead thickness in a few areas did not increase occupational dose above the exposure estimates established in Table 7.4-1. Therefore, it can be concluded that the minimum lead thickness non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) shell identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Outer Shoulder Diameter Non Conformance			72.48 Log No.: SE00058	
D4-TC-9; 55/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved Approved Disapproved

Signature: [signature] Tom N. Woodfield Signature: Michael J. Gahan
INDEPENDENT REVIEWER for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11·26·97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Lemon Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Outer Shoulder Diameter Non Conformance	72.48 Log No.: SE00058
D4-TC-9; 55/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) upper trunnion identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Outer Shoulder Diameter Non Conformance			72.48 Log No.: SE00058	
D4-TC-9; 55/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the upper trunnion outer shoulder diameter non conformance. The subject non conformance (Sulzer Bingham NCR No. 111333) identifies the TC upper trunnion outer shoulder diameter was reduced from 8.000" to 7.800" +/- 0.05". The trunnion outer shoulder diameter was changed to repair a false cut incurred during fabrication. Calculation BGE001.0217 revision 0 analyzed this condition and verified the structural adequacy of the upper lifting trunnion body. The supporting calculations are shown below.

Assuming outer and inner diameters of 7.75" and 4.00" respectively, the section properties of the upper trunnion body are:

$\text{Area} = \pi[\{(7.75)^2 - (4.00)^2\} / 4] = 34.6 \text{ in}^2$

$S = \pi[\{(7.75)^4 - (4.00)^4\} / \{(32)(7.75)] = 42.5 \text{ in}^3$

The maximum shear and moment handing loads, as shown in calculation BGE001.0202 revision 4, are 115 kips and 201 inch-kips respectively. The resulting stresses in the upper lifting trunnion body are:

$\sigma_v = 115 / 34.6 = 3.3 \text{ ksi}$

$\sigma_b = 201 / 42.5 = 4.7 \text{ ksi}$

The resulting stress intensity is therefore,

$\text{S.I.} = (4.7 / 2) +/- [(4.7 / 2)^2 + (3.3)^2]^{1/2} = 6.4\text{ksi}$

The calculated stress intensity increase from 5.9 ksi to 6.4 ksi is less than half of the ANSI N14.6 allowable stress intensity of 13.5 ksi. The upper trunnion shoulder are therefore adequate to perform their function. All other trunnion body stresses are unchanged. The section modulus above is validated by AISC, Ninth Edition. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC upper trunnion, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Outer Shoulder Diameter Non Conformance			72.48 Log No.: SE00058	
D4-TC-9; 55/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the upper trunnion outer shoulder diameter non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the upper trunnion outer shoulder diameter non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the TC upper trunnion outer shoulder diameter was reduced to repair a false cut incurred during fabrication. Based on previous information, the subject non conformance will not affect the form, fit or function of the TC upper trunnion, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Upper Trunnion Outer Shoulder Diameter Non Conformance			72.48 Log No.: SE00058	
D4-TC-9; 55/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a upper trunnion outer shoulder diameter non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The upper trunnion outer shoulder diameter non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) upper trunnion identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Bottom Neutron Shield Cover Tolerance Non Conformance		72.48 Log No.: SE00059		
D4-TC-10; 56/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for ~~GS-DES~~, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Bottom Neutron Shield Cover Tolerance Non Conformance		72.48 Log No.: SE00059
D4-TC-10; 56/129;	ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) bottom neutron shield identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Bottom Neutron Shield Cover Tolerance Non Conformance	72.48 Log No.: SE00059
D4-TC-10; 56/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the bottom neutron shield cover tolerance non conformance. The subject non-conformance (Sulzer Bingham NCR No. 111338) identifies the gap between the bottom surface of the bottom forging and the bottom of the bottom neutron shield cover varies within the range of 0.04" and 0.19". The allowable gap is 0.12" +/- 0.05. The 0.75" thick cask bottom neutron shield cover plate is designed to be recessed below the bottom flange by 0.12". The purpose of this design is to force the cask to rest on the bottom flange, a rigid machined flat surface, rather than the relatively yielding and uneven bottom cover plate when set vertically. With the as-built configuration the recess is maintained, although it deviates from the design tolerances. Since the recess is specified for clearance only, these deviations do not affect any function of the cask. No analytical condition is affected. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC bottom neutron shield cover, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the bottom neutron shield cover tolerance non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Bottom Neutron Shield Cover Tolerance Non Conformance			72.48 Log No.: SE00059	
D4-TC-10; 56/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the bottom neutron shield cover tolerance non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the gap between the bottom surface of the bottom forging and the bottom of the bottom neutron shield cover varies within the range of 0.04" and 0.19". The allowable gap is 0.12" +/- 0.05. The 0.75" thick cask bottom neutron shield cover plate is designed to be recessed below the bottom flange by 0.12". The purpose of this design is to force the cask to rest on the bottom flange, a rigid machined flat surface, rather than the relatively yielding and uneven bottom cover plate when set vertically. With the as-built configuration the recess is maintained, although it deviates from the design tolerances. Since the recess is specified for clearance only, these deviations do not affect any function of the cask. Based on previous information, the subject non conformance will not affect the form, fit or function of the bottom neutron shield cover, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a bottom neutron shield cover tolerance non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The bottom neutron shield cover tolerance non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Bottom Neutron Shield Cover Tolerance Non Conformance				72.48 Log No.: SE00059
D4-TC-10; 56/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) bottom neutron shield identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Plug Diameter Non Conformance				72.48 Log No.: SE00060
D4-TC-11; 57/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Tom N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for ~~GS-DES~~, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11.26.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Plug Diameter Non Conformance			72.48 Log No.: SE00060	
D4-TC-11; 57/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) lower trunnion identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Plug Diameter Non Conformance	72.48 Log No.: SE00060
D4-TC-11; 57/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the lower trunnion plug diameter non conformance. The subject non conformance identifies the diameter of the plug for the TC lower trunnions was changed from 2.00" to 2.25" to ease fabrication. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC lower trunnion, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the lower trunnion plug diameter non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the lower trunnion plug diameter non conformance, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Plug Diameter Non Conformance			72.48 Log No.: SE00060	
D4-TC-11; 57/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the diameter of the plug for the TC lower trunnions was changed from 2.00" to 2.25" to ease fabrication. Based on previous information, the subject non conformance will not affect the form, fit or function of the TC lower trunnion, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a lower trunnion plug diameter non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The lower trunnion plug diameter non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lower Trunnion Plug Diameter Non Conformance			72.48 Log No.: SE00060	
D4-TC-11; 57/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) lower trunnion identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Optical Plug Alignment Target Hole Oversize Non Conformance			72.48 Log No.: SE00061	
D4-TC-12; 58/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
Getachew Tesfaye 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: Jon N. Woodfield Jon N Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Optical Plug Alignment Target Hole Oversize Non Conformance			72.48 Log No.: SE00061	
D4-TC-12; 58/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) optical plug identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Optical Plug Alignment Target Hole Oversize Non Conformance				72.48 Log No.: SE00061
D4-TC-12; 58/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the optical plug target alignment hole non conformance. The subject non conformance (Sulzer Bingham NCR No. 111861) identifies an optical plug target alignment hole on a trunnion is oversized. The hole I.D. is 0.2530" at the outside and 0.2506" at the inside. The allowable is 0.2500" + 0.001" - 0.000". The function of the alignment hole is to provide a base for insertion of an optical plug target which is specified to be within 0.01" of the true position of the cask centerline. Although the shape of the hole (slightly conical) results in part of the hole exceeding the specified diameter tolerance, the actual location of the hole, combined with the oversize diameter, will not result in a target position outside the required tolerance. No analytical condition is affected. Since the final location of the optical plug location will still fall within the 0.01" design tolerance, then the fact that the target holes are oversized per their very constraining tolerances is acceptable. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC optical plug, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the optical plug target alignment hole non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the optical plug target alignment hole non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies an optical plug target alignment hole on a trunnion is oversized. The function of the alignment hole is to provide a base for insertion of an optical plug target which is specified to be within 0.01" of the true position of the cask centerline. Although the shape of the hole (slightly conical) results in part of the hole exceeding the specified diameter tolerance, the actual location of the hole, combined with the oversize diameter, will not result in a target position outside the required tolerance. Since the final location of the optical plug location will still fall within the 0.01" design tolerance, then the fact that the target holes are oversized per their very constraining tolerances is acceptable. Based on previous information, the subject non conformance will not affect the form, fit or function of the TC optical plug, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a optical plug target alignment hole non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The optical plug target alignment hole non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Optical Plug Alignment Target Hole Oversize Non Conformance			72.48 Log No.: SE00061	
D4-TC-12; 58/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) optical plug identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Nitronic Rail Minimum Width Non Conformance				72.48 Log No.: SE00062
D4-TC-13; 59/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved | Approved Disapproved

Signature: [signature] Tom N. Woodfield
INDEPENDENT REVIEWER
Date 11/12/97

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11·26·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: J R Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Nitronic Rail Minimum Width Non Conformance			72.48 Log No.: SE00062
D4-TC-13; 59/129; ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) Nitronic 60 rail identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Nitronic Rail Minimum Width Non Conformance				72.48 Log No.: SE00062
D4-TC-13; 59/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the Nitronic 60 rail minimum width non conformance. The subject non conformance (Sulzer Bingham NCR No. 111908) identifies the width of the TC Nitronic 60 rails is below the minimum tolerance. The minimum width of the rails is 2.916", while the minimum allowable is 2.95". This is acceptable since the DSC bears on the center portion of the rails, and not on the edges. The amount of the undersize of the rail represents roughly a reduction in width of 1% and does not adversely affect the performance of the rails when the canister is slid out of or back into the cask. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC or Nitronic 60 rails, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. In addition, there is no detrimental operational impact associated with this activity, including the insertion and removal of the DSC. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the Nitronic 60 rail minimum width non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the Nitronic 60 rail minimum width non conformance, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Nitronic Rail Minimum Width Non Conformance			72.48 Log No.: SE00062	
D4-TC-13; 59/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the width of the TC Nitronic 60 rails is below the minimum tolerance. This is acceptable since the DSC bears on the center portion of the rails, and not on the edges. The amount of the undersize of the rail represents roughly a reduction in width of 1% and does not adversely affect the performance of the rails when the canister is slid out of or back into the cask. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC or Nitronic 60 rails, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. In addition, there is no detrimental operational impact associated with this activity, including the insertion and removal of the DSC. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a Nitronic 60 rail minimum width non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The Nitronic 60 rail minimum width non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Nitronic Rail Minimum Width Non Conformance 72.48 Log No.: SE00062				
D4-TC-13; 59/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) Nitronic 60 rail identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Alignment Target Hole Oversize Non Conformance				72.48 Log No.: SE00063
D4-TC-14; 60/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Jon N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Alignment Target Hole Oversize Non Conformance	72.48 Log No.: SE00063
D4-TC-14; 60/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) alignment target hole identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Alignment Target Hole Oversize Non Conformance			72.48 Log No.: SE00063	
D4-TC-14; 60/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the TC alignment target hole non conformance. The subject non conformance (Sulzer Bingham NCR No. 111912) identifies an optical plug alignment target hole on a trunnion is oversized. The upper half of the target hole is oversize at 0.252". The allowable is 0.2500" + 0.001" - 0.000". The upper half of the target hole of 0.001" oversize at 0.252'. The function of the alignment hole is to provide a base for insertion of an optical plug target which is specified to be within 0.01" of the true position of the cask centerline. The true position of the hole is 0.008" from its specified location and the oversize condition will therefore not exceed the 0.010" tolerance. The oversize condition will not cause excessive looseness in the fit of the alignment target. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC optical plug, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the TC alignment target hole non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the TC alignment target hole non conformance, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Alignment Target Hole Oversize Non Conformance			72.48 Log No.: SE00063	
D4-TC-14; 60/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies an optical plug alignment target hole on a trunnion is oversized. The function of the alignment hole is to provide a base for insertion of an optical plug target which is specified to be within 0.01" of the true position of the cask centerline. The true position of the hole is 0.008" from its specified location and the oversize condition will therefore not exceed the 0.010" tolerance. The oversize condition will not cause excessive looseness in the fit of the alignment target. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC optical plug, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a TC alignment target hole non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The TC alignment target hole non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Alignment Target Hole Oversize Non Conformance			72.48 Log No.: SE00063	
D4-TC-14; 60/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) alignment target hole identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom O-Ring Groove Maximum Depth Non Conformance				72.48 Log No.: SE00064
D4-TC-15; 61/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] Tom N. Woodfield
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: J. R. Lemons Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.:______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom O-Ring Groove Maximum Depth Non Conformance				**72.48 Log No.: SE00064**
D4-TC-15; 61/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 2 of 5**

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) bottom O-ring identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom O-Ring Groove Maximum Depth Non Conformance				72.48 Log No.: SE00064
D4-TC-15; 61/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the bottom O-ring non conformance. The subject non conformance (Sulzer Bingham NCR No. 111918) identifies the design depth of the TC bottom cover plate bottom O-ring groove of 0.183" was exceeded. The maximum measured depth is 0.185". The O-ring seal is designed for a nominal compression of about 0.025". An excess depth of 0.002" will not reduce the pressure retaining capacity of the seal according to the manufacturer. In addition, the function of the seal has been demonstrated by hydrostatic testing. The O-rings are Parker O-rings made of ethylene propylene with an inside diameter of 17.955" and a width a of 0.21". The nominal compression expected by the manufacturer will meet the design needs. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC bottom O-ring, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the bottom O-ring non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the bottom O-ring non conformance, there will be no increase in the accident dose consequences already described in the USAR.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom O-Ring Groove Maximum Depth Non Conformance		72.48 Log No.: SE00064	
D4-TC-15; 61/129;	ES199601368	Supplement 001	Revision 0000 Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the design depth of the TC bottom cover plate bottom O-ring groove of 0.183" was exceeded. The maximum measured depth is 0.185". The O-ring seal is designed for a nominal compression of about 0.025". An excess depth of 0.002" will not reduce the pressure retaining capacity of the seal according to the manufacturer. In addition, the function of the seal has been demonstrated by hydrostatic testing. The O-rings are Parker O-rings made of ethylene propylene with an inside diameter of 17.955" and a width a of 0.21". The nominal compression expected by the manufacturer will meet the design needs. Based on previous information, the subject non conformance will not affect the form, fit or function of the TC bottom O-ring, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a bottom O-ring non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The bottom O-ring non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom O-Ring Groove Maximum Depth Non Conformance 72.48 Log No.: SE00064				
D4-TC-15; 61/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) bottom O-ring identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom Forging Minimum Diameter Non Conformance	**72.48 Log No.: SE00065**
D4-TC-16; 62/129; ES199601368 Supplement 001 Revision 0000	**Page 1 of 5**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO	Involve an unreviewed safety question (USQ)?
NO	Involve a change in the Technical Specifications/License Conditions or Bases?
NO	Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO	Involve a Significant Increase in Occupational Dose?
NO	Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved (circled) Disapproved — Approved (circled) Disapproved

Signature: [signature] Jon N. Whitfield — Signature: Michael J. Gahan
INDEPENDENT REVIEWER — for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 — Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11·26·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom Forging Minimum Diameter Non Conformance			72.48 Log No.: SE00065	
D4-TC-16; 62/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) bottom forging identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.5, 4.7, 5.1, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom Forging Minimum Diameter Non Conformance			72.48 Log No.: SE00065	
D4-TC-16; 62/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of the bottom forging non conformance. The subject non conformance (Sulzer Bingham NCR No. 110210) identifies the outside of the TC bottom forging with a minimum I.D. of 71.875" while the minimum allowable is 71.950" (a difference of 0.075"). Flatness on the inside of the bottom forging was also not met. The design flatness is 0.060", while the maximum deviation is 0.125". The 2" thick cast bottom plate is specified to be flat within 0.060". The as-built plate is concave with a maximum deviation of 0.125" due, evidently, to distortion from the attachment weld to the flange. The cask cavity length is not reduced by this deviation. The as-built geometry will result in the DSC being supported by the rim of the bottom plate, under normal conditions, so that the DSC dead weight is transmitted to the cask directly through the shell of the DSC. This is consistent with the existing analytical assumptions. During fabrication, deviations are expected to occur. The tolerances are often conservative, thus when they are exceeded, the magnitude of variance must be evaluated. In this case, the deviation does not affect the structural design nor the functionality of the transfer cask. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC bottom forging, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the TC which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

NO May the consequences of an accident previously evaluated in the SAR be increased?

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. One accident scenario described in the ISFSI USAR addresses the structural integrity of the transfer cask, the DSC, and its internals under a postulated transfer cask accident condition. The USAR states that an actual drop event is not credible, and the accident analysis concluded that fuel cladding integrity will be maintained for the postulated 80" transfer cask drop. Since the bottom forging non conformance does not adversely affect the ability of the TC to perform it's intended design function, the structural integrity of the TC is not affected, and as such, the probability of occurrence of the transfer cask accident previously evaluated in the SAR will not be increased as a result of this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom Forging Minimum Diameter Non Conformance			72.48 Log No.: SE00065	
D4-TC-16; 62/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this proposed activity. The cask drop analysis concluded that the transfer cask, the DSC, and its internal basket assembly and contained fuel will maintain its structural integrity through a cask drop. Since the intended design function of the TC has not changed as a result of the bottom forging non conformance, there will be no increase in the accident dose consequences already described in the USAR.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance identifies the outside of the TC bottom forging with a minimum I.D. of 71.875" while the minimum allowable is 71.950" (a difference of 0.075"). Flatness on the inside of the bottom forging was also not met. The cask cavity length is not reduced by this deviation. The as-built geometry will result in the DSC being supported by the rim of the bottom plate, under normal conditions, so that the DSC dead weight is transmitted to the cask directly through the shell of the DSC. This is consistent with the existing analytical assumptions. During fabrication, deviations are expected to occur. The tolerances are often conservative, thus when they are exceeded, the magnitude of variance must be evaluated. In this case, the deviation does not affect the structural design nor the functionality of the transfer cask. Based on the above information, the subject non conformance will not affect the form, fit or function of the TC bottom forging, is not detrimental to the structural integrity of the TC, and will not adversely affect the ability of the TC to perform its intended design function. Therefore, this activity has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a bottom forging non conformance. BGE approved this non conformance for construction prior to the issuance of the ISFSI license in November, 1992. The bottom forging non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - TC Bottom Forging Minimum Diameter Non Conformance				72.48 Log No.: SE00065
D4-TC-16; 62/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the TC (Transfer Cask) bottom forging identified during TC fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Classification				72.48 Log No.: SE00069
A-LY-11; 66/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk
PRINTED NAME AND SIGNATURE
Department: NED-CEU 42-01-04 Date: 11-7-97

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
11/12/97 SIGNATURE / DATE	11/10/97 SIGNATURE / DATE	11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: M.A. CARR
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, ES-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ____ Signature: ____ POSRC CHAIRMAN Date 11-26-97

Approved ✓ Disapproved ____ Signature: ____ PLANT GENERAL MANAGER Date 12/1/97

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: ____ OSSRC SES CHAIRMAN Date: 1/30/98

If yes, OSSRC Meeting No.: ____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Classification			72.48 Log No.: SE00069	
A-LY-11; 66/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses the classification of the lifting yoke.

Reason for Activity: This safety evaluation addresses a discrepancy between the NRC SER and ISFSI USAR. The NRC SER identifies the TC (Transfer Cask) lifting yoke system as "not important to safety", whereas the ISFSI USAR states the yoke is a "safety-related component", which is the correct classification. The reason for this particular safety evaluation is to assure that the discrepancy between the NRC SER and ISFSI USAR regarding the safety classification of the TC yoke system has been analyzed to assure conformance with the ISFSI Technical Specifications and the ISFSI USAR.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Lifting Yoke (Yoke) - the lifting yoke is a special lifting device consisting of an open hook design with two thick, high strength parallel lifting beams which is compatible with the single-failure-proof Spent Fuel Cask Handling Crane. The function of the yoke is to provide a means for performing all cask handling operations within the Auxiliary Building. The yoke engages the outer shoulder of the transfer cask lifting trunnions. It is designed to support a loaded transfer cask weighing up to 100 tons, and factory tested at three times its design load, or 300 tons. The lifting yoke has bolted connections to facilitate ease of maintenance. In addition, the lifting yoke is controlled by NUREG-0612 and is designed in accordance with Section 7 of ANSI N14.6-1986, and there are no structural welds requiring periodic inspection.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.4, 4.7, 5.1, 5.2, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Classification			72.48 Log No.: SE00069	
A-LY-11; 66/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of the USAR designating the lifting yoke as safety-related. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The NRC SER states in Section 2.2.4, that the yoke system is classified as equipment "not important to safety". The ISFSI USAR states in Section 4.7 that the lifting yoke is a special lifting device which provides the means for performing all cask handling operations in the plant's Auxiliary Building. It is designed to support a loaded transfer cask weighing up to 100 tons. A lifting pin connects the Spent Fuel Cask Handling Crane hook and the lifting yoke. The lifting yoke is designated safety-related since it is in the direct load path of the cask. The codes and standards used to design and fabricate the lifting yoke are presented in ISFSI USAR Section 4.7.4. The lifting yoke was designed, fabricated, and procured as a safety-related component for ISFSI operations. The SER and the SAR both correctly state that the TC yoke system is only used inside the spent fuel pool building and is controlled by 10CFR Part 50 regulations. This safety evaluation clarifies an existing condition, and does not change the approved safety-related design of the TC yoke system. This analysis assures the safety-related classification as described in the USAR. This clarification has no detrimental impact on equipment important to safety. Therefore, this discrepancy between the NRC SER and the ISFSI USAR will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. There are no physical changes to the lifting yoke as a result of this proposed activity. As stated above, there are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. There are no physical changes to the lifting yoke as a result of this proposed activity. None of the accident scenarios address the use of the lifting yoke in the Auxiliary Building.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. There are no physical changes to the lifting yoke as a result of this proposed activity. As stated above, there are no possible accidents of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Classification			**72.48 Log No.: SE00069**	
A-LY-11; 66/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 4 of 5**

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

<u>Possibility of New Malfunction:</u>

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this discrepancy between the NRC SER and the ISFSI USAR. The TC yoke system is safety-related as described in the ISFSI USAR. This safety evaluation clarifies an existing condition, and does not change the approved safety-related design of the TC yoke system. In regard to the subject clarification, no credible scenario can be postulated which would create a malfunction of a different type than any previously evaluated in the SAR. Therefore, this activity does not increase the possibility of a malfunction of a different type than any previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

<u>Possibility of New Accident:</u>

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. There are no physical changes to the lifting yoke as a result of this proposed activity. No new accident scenarios are created as the result of this proposed activity.

<u>Complete for 50.59 and 72.48:</u>

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

<u>Bases</u> <u>Discussion of why the margin of safety is not reduced</u>

None of the Technical Specifications nor the Bases are affected by this activity.

<u>Complete for 72.48:</u>

NO Will the proposed activity involve a significant increase in occupational dose?

<u>A significant increase in occupational dose:</u>

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity involved a discrepancy between the NRC SER and ISFSI USAR. The SER identifies the TC (Transfer Cask) lifting yoke system as "not important to safety", whereas the USAR states the yoke is a "safety related component", which is the correct classification. There are no physical changes to the lifting yoke as a result of this proposed activity. This activity does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

<u>A significant unreviewed environmental impact:</u>

A significant unreviewed environmental impact will not occur as the result of this proposed activity. There are no physical changes to the lifting yoke as a result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Classification			72.48 Log No.: SE00069	
A-LY-11; 66/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses the classification of the lifting yoke.

Reason for Activity: This safety evaluation addresses a discrepancy between the NRC SER and ISFSI USAR. The NRC SER identifies the TC (Transfer Cask) lifting yoke system as "not important to safety", whereas the ISFSI USAR states the yoke is a "safety-related component", which is the correct classification. The reason for this particular safety evaluation is to assure that the discrepancy between the NRC SER and ISFSI USAR regarding the safety classification of the TC yoke system has been analyzed to assure conformance with the ISFSI Technical Specifications and the ISFSI USAR.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Loctite From Lifting Yoke Connection Bolts				72.48 Log No.: SE00070
D3-LY-1; 67/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan III
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Loctite From Lifting Yoke Connection Bolts			72.48 Log No.: SE00070	
D3-LY-1; 67/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change which removed the Loctite from the yoke connection bolts.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Lifting Yoke (Yoke) - the lifting yoke is a special lifting device consisting of an open hook design with two thick, high strength parallel lifting beams which is compatible with the single-failure-proof Spent Fuel Cask Handling Crane. The function of the yoke is to provide a means for performing all cask handling operations within the Auxiliary Building. The yoke engages the outer shoulder of the transfer cask lifting trunnions. It is designed to support a loaded transfer cask weighing up to 100 tons, and factory tested at three times its design load, or 300 tons. The lifting yoke has bolted connections to facilitate ease of maintenance. In addition, the lifting yoke is controlled by NUREG-0612 and is designed in accordance with Section 7 of ANSI N14.6-1986, and there are no structural welds requiring periodic inspection.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.4, 4.7, 5.1, 5.2, 7.4, 8.1, and 8.2, and Appendix A, Yoke System.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Loctite From Lifting Yoke Connection Bolts			72.48 Log No.: SE00070	
D3-LY-1; 67/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of the lifting yoke connection bolts design change. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The subject activity removed the Loctite from the yoke connection bolts, which does not affect any design conditions of the yoke. The yoke connection has bolts, nuts, and washers which are acceptable for this application. The bolts are torqued to 500 ft-lbs after assembly, which eliminates the need for the Loctite. This activity has no impact on the fit, form, or function of the yoke connection bolts or the lifting yoke. Based on this information, eliminating the Loctite will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. There is no change in the performance of the connection bolts as a result of this proposed activity. As stated above, there are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. There is no change in the performance of the connection bolts as a result of this proposed activity. None of the accident scenarios address the use of the lifting yoke in the Auxiliary Building.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. As stated above, there are no possible accidents of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. There is no change in the performance of the connection bolts as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Loctite From Lifting Yoke Connection Bolts			72.48 Log No.: SE00070
D3-LY-1; 67/129;	ES199601368 Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity removed the Loctite from the yoke connection bolts, which does not affect any design conditions of the yoke. The yoke connection has bolts, nuts, and washers which are acceptable for this application. The bolts are torqued to 500 ft-lbs after assembly, which eliminates the need for the Loctite. This activity has no impact on the fit, form, or function of the yoke connection bolts or the lifting yoke. Based on this information, eliminating the Loctite will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. There is no change in the performance of the connection bolts as a result of this proposed activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a lifting yoke connection bolts design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. There is no change in the performance of the connection bolts or in the operation of the lifting yoke as a result of this proposed activity. The lifting yoke connection bolts design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. There is no change in the performance of the connection bolts or in the operation of the lifting yoke as a result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Deletion of Loctite From Lifting Yoke Connection Bolts			72.48 Log No.: SE00070
D3-LY-1; 67/129; ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change which removed the Loctite from the yoke connection bolts.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Profile Design Change				72.48 Log No.: SE00071
D3-LY-2; 68/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
Getachew Tesfaye 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: M. A. Carr M. A. CARR
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11.26.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Profile Design Change			72.48 Log No.: SE00071	
D3-LY-2; 68/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the lifting yoke bearing plate profile since the original profile of the bearing plate did not match that of the yoke hook.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Lifting Yoke (Yoke) - the lifting yoke is a special lifting device consisting of an open hook design with two thick, high strength parallel lifting beams which is compatible with the single-failure-proof Spent Fuel Cask Handling Crane. The function of the yoke is to provide a means for performing all cask handling operations within the Auxiliary Building. The yoke engages the outer shoulder of the transfer cask lifting trunnions. It is designed to support a loaded transfer cask weighing up to 100 tons, and factory tested at three times its design load, or 300 tons. The lifting yoke has bolted connections to facilitate ease of maintenance. In addition, the lifting yoke is controlled by NUREG-0612 and is designed in accordance with Section 7 of ANSI N14.6-1986, and there are no structural welds requiring periodic inspection.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.4, 4.7, 5.1, 5.2, 7.4, 8.1, and 8.2, and Appendix A, Yoke System.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Profile Design Change			72.48 Log No.: SE00071	
D3-LY-2; 68/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of the lifting yoke bearing plate profile design change. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The subject activity changed the profile of the bearing plate since the original profile of the bearing plate did not match that of the yoke hook. The change was made to ease installation of the bearing plate and does not affect the completed form of the lifting yoke. Therefore, the redesigned plate has no impact on the fit, form, or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. There is no change in the structural capability of the lifting yoke, and the ability of the lifting yoke to perform its intended design function is not affected as a result of this proposed activity. As stated above, there are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. There is no change in the structural capability of the lifting yoke, and the ability of the lifting yoke to perform its intended design function is not affected as a result of this proposed activity. None of the accident scenarios address the use of the lifting yoke in the Auxiliary Building.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. There is no change in the structural capability of the lifting yoke, and the ability of the lifting yoke to perform its intended design function is not affected as a result of this proposed activity. As stated above, there are no possible accidents of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Profile Design Change			72.48 Log No.: SE00071	
D3-LY-2; 68/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed the profile of the bearing plate since the original profile of the bearing plate did not match that of the yoke hook. The change was made to ease installation of the bearing plate and does not affect the completed form of the lifting yoke. Based on this information, the redesigned plate will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. There is no change in the structural capability of the lifting yoke, and the ability of the lifting yoke to perform its intended design function is not affected as a result of this proposed activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a lifting yoke bearing plate profile design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. There is no change in the structural capability of the lifting yoke, and the ability of the lifting yoke to perform its intended design function is not affected as a result of this proposed activity. The lifting yoke bearing plate profile design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. There is no change in the structural capability of the lifting yoke, and the ability of the lifting yoke to perform its intended design function is not affected as a result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Profile Design Change			72.48 Log No.: SE00071	
D3-LY-2; 68/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the lifting yoke bearing plate profile since the original profile of the bearing plate did not match that of the yoke hook.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Pin Support / Cradle Design Change				72.48 Log No.: SE00072
D3-LY-3; 69/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Pin Support / Cradle Design Change			72.48 Log No.: SE00072	
D3-LY-3; 69/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the lifting yoke which changed the pin support with a pin cradle.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Lifting Yoke (Yoke) - the lifting yoke is a special lifting device consisting of an open hook design with two thick, high strength parallel lifting beams which is compatible with the single-failure-proof Spent Fuel Cask Handling Crane. The function of the yoke is to provide a means for performing all cask handling operations within the Auxiliary Building. The yoke engages the outer shoulder of the transfer cask lifting trunnions. It is designed to support a loaded transfer cask weighing up to 100 tons, and factory tested at three times its design load, or 300 tons. The lifting yoke has bolted connections to facilitate ease of maintenance. In addition, the lifting yoke is controlled by NUREG-0612 and is designed in accordance with Section 7 of ANSI N14.6-1986, and there are no structural welds requiring periodic inspection.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.4, 4.7, 5.1, 5.2, 7.4, 8.1, and 8.2, and Appendix A, Yoke System.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Pin Support / Cradle Design Change			72.48 Log No.: SE00072	
D3-LY-3; 69/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of the lifting yoke pin support / cradle design change. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The subject activity replaces the lifting yoke pin support with a pin cradle. The pin support / cradle serves to hold the yoke pin when it is not engaged with the plant crane. The intent of this design change is to provide better full pin support and to ease the insertion and removal of the component without binding. The cradle is not safety-related and is not a structural component of the lifting yoke. This design change does not affect any analytical conditions. Based on this information, the lifting yoke pin support / cradle design change will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this design change has no detrimental impact on equipment important to safety. Since this activity has no impact on the lifting yoke or any other SSC, this activity would not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The cradle is not safety-related and is not a structural component of the lifting yoke, and therefore will not adversely affect the ability of the lifting yoke to perform its intended design function. As stated above, there are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The cradle is not safety-related and is not a structural component of the lifting yoke, and therefore will not adversely affect the ability of the lifting yoke to perform its intended design function. None of the accident scenarios address the use of the lifting yoke in the Auxiliary Building.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Pin Support / Cradle Design Change			72.48 Log No.: SE00072	
D3-LY-3; 69/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The cradle is not safety-related and is not a structural component of the lifting yoke, and therefore will not adversely affect the ability of the lifting yoke to perform its intended design function. As stated above, there are no possible accidents of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity replaces the lifting yoke pin support with a pin cradle. The pin support / cradle serves to hold the yoke pin when it is not engaged with the plant crane. The intent of this design change is to provide better full pin support and to ease the insertion and removal of the component without binding. The cradle is not safety-related and is not a structural component of the lifting yoke. This design change does not affect any analytical conditions. Based on this information, the lifting yoke pin support / cradle design change will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The cradle is not safety-related and is not a structural component of the lifting yoke, and therefore will not adversely affect the ability of the lifting yoke to perform its intended design function. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a lifting yoke pin support / cradle design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. There is no change in the performance of the pin cradle or in the operation of the lifting yoke as a result of this proposed activity. The lifting yoke pin support / cradle design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Pin Support / Cradle Design Change			72.48 Log No.: SE00072	
D3-LY-3; 69/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. There is no change in the performance of the pin cradle or in the operation of the lifting yoke as a result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the lifting yoke which changed the pin support with a pin cradle.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Cable Assemblies Design Change				72.48 Log No.: SE00073
D3-LY-4; 70/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved ~~Approved~~ Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/12/97

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11-26-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .:______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Cable Assemblies Design Change				72.48 Log No.: SE00073
D3-LY-4; 70/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change which upgraded the lifting yoke cable assemblies to comply with ANSI N14.6-1986.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Lifting Yoke (Yoke) - the lifting yoke is a special lifting device consisting of an open hook design with two thick, high strength parallel lifting beams which is compatible with the single-failure-proof Spent Fuel Cask Handling Crane. The function of the yoke is to provide a means for performing all cask handling operations within the Auxiliary Building. The yoke engages the outer shoulder of the transfer cask lifting trunnions. It is designed to support a loaded transfer cask weighing up to 100 tons, and factory tested at three times its design load, or 300 tons. The lifting yoke has bolted connections to facilitate ease of maintenance. In addition, the lifting yoke is controlled by NUREG-0612 and is designed in accordance with Section 7 of ANSI N14.6-1986, and there are no structural welds requiring periodic inspection.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.4, 4.7, 5.1, 5.2, 7.4, 8.1, and 8.2, and Appendix A, Yoke System.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Cable Assemblies Design Change	72.48 Log No.: SE00073
D3-LY-4; 70/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of the lifting yoke cable assemblies design change. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The subject activity upgraded the four cable assemblies to comply with ANSI N14.6-1986. This change moved the turnbuckles to the bottom of the assemblies, replaced the lower connector with a jaw, replaced the upper connector with a shackle, and increased the cable size to 1/2" diameter 6x19 cable. The result of this change was that the yoke cable assemblies load rating increased. The cable assemblies were redesigned as a dual load path system with a design load of 7,900 pounds. In addition, each of cables were factory load tested to 6,000 pounds with a working load rating of 4,550 pounds, with a safety factor of 5:1. The function of the cable assemblies is to lift and transfer the shield plug during the DSC transfer and closure operations. This design change was fully evaluated and approved via calculation BGE001.0209, Revision 5. This design change does not adversely affect any hardware and does not affect any analytical conditions. Based on this information, the lifting yoke cable assemblies design change will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this design change has no detrimental impact on equipment important to safety. Since this activity has no impact on the lifting yoke or any other SSC, this activity would not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. As stated above, there are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. None of the accident scenarios address the use of the lifting yoke in the Auxiliary Building.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. As stated above, there are no possible accidents of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Cable Assemblies Design Change				72.48 Log No.: SE00073
D3-LY-4; 70/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity upgraded the four cable assemblies to comply with ANSI N14.6-1986. This change moved the turnbuckles to the bottom of the assemblies, replaced the lower connector with a jaw, replaced the upper connector with a shackle, and increased the cable size to 1/2" diameter 6x19 cable. The result of this change was that the yoke cable assemblies load rating increased. The cable assemblies were redesigned as a dual load path system with a design load of 7,900 pounds. In addition, each of cables were factory load tested to 6,000 pounds with a working load rating of 4,550 pounds, with a safety factor of 5:1. The function of the cable assemblies is to lift and transfer the shield plug during the DSC transfer and closure operations. This design change was fully evaluated and approved via calculation BGE001.0209, Revision 5. This design change does not adversely affect any hardware and does not affect any analytical conditions. Based on this information, the lifting yoke cable assemblies design change will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a lifting yoke cable assemblies design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The lifting yoke cable assemblies design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Cable Assemblies Design Change				72.48 Log No.: SE00073
D3-LY-4; 70/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change which upgraded the lifting yoke cable assemblies to comply with ANSI N14.6-1986.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Fab Plate Max Thickness Non Conformance				72.48 Log No.: SE00074
D4-LY-1; 71/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan III
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11.26.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Fab Plate Max Thickness Non Conformance			72.48 Log No.: SE00074	
D4-LY-1; 71/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the lifting yoke identified during fabrication in which the plate used to fabricate the lifting yoke hooks and beams was oversized by 0.02".

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Lifting Yoke (Yoke) - the lifting yoke is a special lifting device consisting of an open hook design with two thick, high strength parallel lifting beams which is compatible with the single-failure-proof Spent Fuel Cask Handling Crane. The function of the yoke is to provide a means for performing all cask handling operations within the Auxiliary Building. The yoke engages the outer shoulder of the transfer cask lifting trunnions. It is designed to support a loaded transfer cask weighing up to 100 tons, and factory tested at three times its design load, or 300 tons. The lifting yoke has bolted connections to facilitate ease of maintenance. In addition, the lifting yoke is controlled by NUREG-0612 and is designed in accordance with Section 7 of ANSI N14.6-1986, and there are no structural welds requiring periodic inspection.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.4, 4.7, 5.1, 5.2, 7.4, 8.1, and 8.2, and Appendix A, Yoke System.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Fab Plate Max Thickness Non Conformance	72.48 Log No.: SE00074
D4-LY-1; 71/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of the lifting yoke fab plate non conformance. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The subject non conformance (Sulzer Bingham NCR No. 111319) identified the plate used to fabricate the lifting yoke hooks and beams was oversized by 0.02". The maximum allowable was 3.03" and the actual plate used was 3.05". The calculated stresses were reduced slightly by the oversized plate and the fit-up of the yoke with the cask was assured by testing. This non conformance does not adversely affect any hardware. This non conformance does not affect any analytical conditions. Based on this information, the lifting yoke fab plate non conformance will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this non conformance has no detrimental impact on equipment important to safety. Since this activity has no impact on the lifting yoke or any other SSC, this activity would not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. As stated above, there are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. None of the accident scenarios address the use of the lifting yoke in the Auxiliary Building.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. As stated above, there are no possible accidents of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Fab Plate Max Thickness Non Conformance			72.48 Log No.: SE00074
D4-LY-1; 71/129; ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance (Sulzer Bingham NCR No. 111319) identified the plate used to fabricate the lifting yoke hooks and beams was oversized by 0.02". The maximum allowable was 3.03" and the actual plate used was 3.05". The calculated stresses were reduced slightly by the oversized plate and the fit-up of the yoke with the cask was assured by testing. This non conformance does not adversely affect any hardware. This non conformance does not affect any analytical conditions. Based on this information, the lifting yoke fab plate non conformance will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this non conformance has no detrimental impact on equipment important to safety. Since this activity has no impact on the lifting yoke or any other SSC, this activity would not increase the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. This proposed activity will not adversely affect the ability of the lifting yoke to perform its intended design function. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a lifting yoke fab plate non conformance. BGE approved this non conformance prior to the issuance of the ISFSI license in November, 1992. There is no change in the performance or in the operation of the lifting yoke as a result of this proposed activity. The lifting yoke fab plate non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. There is no change in the performance or in the operation of the lifting yoke as a result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Fab Plate Max Thickness Non Conformance			72.48 Log No.: SE00074	
D4-LY-1; 71/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the lifting yoke identified during fabrication in which the plate used to fabricate the lifting yoke hooks and beams was oversized by 0.02".

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Material Non Conformance			72.48 Log No.: SE00075	
D4-LY-2; 72/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A CARR
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11·26·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Material Non Conformance	72.48 Log No.: SE00075
D4-LY-2; 72/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the lifting yoke bearing plate material identified during fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Lifting Yoke (Yoke) - the lifting yoke is a special lifting device consisting of an open hook design with two thick, high strength parallel lifting beams which is compatible with the single-failure-proof Spent Fuel Cask Handling Crane. The function of the yoke is to provide a means for performing all cask handling operations within the Auxiliary Building. The yoke engages the outer shoulder of the transfer cask lifting trunnions. It is designed to support a loaded transfer cask weighing up to 100 tons, and factory tested at three times its design load, or 300 tons. The lifting yoke has bolted connections to facilitate ease of maintenance. In addition, the lifting yoke is controlled by NUREG-0612 and is designed in accordance with Section 7 of ANSI N14.6-1986, and there are no structural welds requiring periodic inspection.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.4, 4.7, 5.1, 5.2, 7.4, 8.1, and 8.2, and Appendix A, Yoke System.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Material Non Conformance			72.48 Log No.: SE00075	
D4-LY-2; 72/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of the lifting yoke bearing plate material non conformance. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The subject non conformance (Sulzer Bingham NCR No. 111339) involved the use of an aluminum bronze tube for the lifting yoke bearing plates with an 8% aluminum content, while the allowable aluminum range was 9% ± 1/2%. The yield strength of the material is 24.1 ksi, which is slightly less than the 25 ksi required by ASTM B148. The bearing plates are used as a bearing surface only and are not in tension. Any tensile strength in the general range of aluminum bronze properties is acceptable. The bearing function and galling resistance are not affected by this minor out-of-specification condition. This non conformance does not adversely affect any hardware. This non conformance does not affect any analytical conditions. Based on this information, the lifting yoke bearing plate material non conformance will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this non conformance has no detrimental impact on equipment important to safety. Since this activity has no impact on the lifting yoke or any other SSC, this activity would not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. As stated above, there are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. None of the accident scenarios address the use of the lifting yoke in the Auxiliary Building.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. As stated above, there are no possible accidents of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Material Non Conformance			72.48 Log No.: SE00075	
D4-LY-2; 72/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance involved the use of an aluminum bronze tube for the lifting yoke bearing plates with an 8% aluminum content, while the allowable aluminum range was 9% $\pm$ 1/2%. The yield strength of the material is 24.1 ksi, which is slightly less than the 25 ksi required by ASTM B148. The bearing plates are used as a bearing surface only and are not in tension. Any tensile strength in the general range of aluminum bronze properties is acceptable. The bearing function and galling resistance are not affected by this minor out of specification condition. This non conformance does not adversely affect any hardware. This non conformance does not affect any analytical conditions. Based on this information, the lifting yoke bearing plate material non conformance will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this non conformance has no detrimental impact on equipment important to safety. Since this activity has no impact on the lifting yoke or any other SSC, this activity would not increase the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. This proposed activity will not adversely affect the ability of the lifting yoke to perform its intended design function. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a lifting yoke bearing plate material non conformance. BGE approved this non conformance prior to the issuance of the ISFSI license in November, 1992. There is no change in the performance or in the operation of the lifting yoke as a result of this proposed activity. The lifting yoke bearing plate material non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. There is no change in the performance or in the operation of the lifting yoke as a result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Bearing Plate Material Non Conformance			72.48 Log No.: SE00075	
D4-LY-2; 72/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the lifting yoke bearing plate material identified during fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification.
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Beams Maximum Spacing Non Conformance				72.48 Log No.: SE00076
D4-LY-3; 73/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature]
for GS-DES, ES-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-135 Date: 11·26·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 11-26-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Beams Maximum Spacing Non Conformance			72.48 Log No.: SE00076	
D4-LY-3; 73/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the lifting yoke beams maximum spacing identified during fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. Those four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Lifting Yoke (Yoke) - the lifting yoke is a special lifting device consisting of an open hook design with two thick, high strength parallel lifting beams which is compatible with the single-failure-proof Spent Fuel Cask Handling Crane. The function of the yoke is to provide a means for performing all cask handling operations within the Auxiliary Building. The yoke engages the outer shoulder of the transfer cask lifting trunnions. It is designed to support a loaded transfer cask weighing up to 100 tons, and factory tested at three times its design load, or 300 tons. The lifting yoke has bolted connections to facilitate ease of maintenance. In addition, the lifting yoke is controlled by NUREG-0612 and is designed in accordance with Section 7 of ANSI N14.6-1986, and there are no structural welds requiring periodic inspection.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.4, 4.7, 5.1, 5.2, 7.4, 8.1, and 8.2, and Appendix A, Yoke System.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Beams Maximum Spacing Non Conformance			72.48 Log No.: SE00076
D4-LY-3; 73/129;	ES199601368 Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of the lifting yoke beams maximum spacing non conformance. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. The subject non conformance (Sulzer Bingham NCR No. 111663) involves the maximum spacing of the lifting beams. The maximum spacing is 7.84", while the allowable spacing is 7.81". The deviation in the beam spacing is due to the waviness in the lifting beam plate material which is not machined on the surfaces. The deviations are local and do not affect the fit-up of the lifting hook plates or of the crane hook pin with the lifting beams. Based on this information, the lifting yoke beams maximum spacing non conformance will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this non conformance has no detrimental impact on equipment important to safety. Since this activity has no impact on the lifting yoke or any other SSC, this activity would not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. As stated above, there are no possible malfunctions of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. None of the accident scenarios address the use of the lifting yoke in the Auxiliary Building.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. The single-failure-proof Spent Fuel Cask Handling Crane is not affected by this proposed activity. As stated above, there are no possible accidents of the lifting yoke which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Beams Maximum Spacing Non Conformance			72.48 Log No.: SE00076	
D4-LY-3; 73/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject non conformance involves the maximum spacing of the lifting beams. The maximum spacing is 7.84", while the allowable spacing is 7.81". The deviation in the beam spacing is due to the waviness in the lifting beam plate material which is not machined on the surfaces. The deviations are local and do not affect the fit-up of the lifting hook plates or of the crane hook pin with the lifting beams. This non conformance does not affect any analytical conditions. Based on this information, the lifting yoke beams maximum spacing non conformance will not affect the form, fit or function of the lifting yoke, is not detrimental to the structural integrity of the lifting yoke, and will not adversely affect the ability of the lifting yoke to perform its intended design function. Therefore, this non conformance has no detrimental impact on equipment important to safety. Since this activity has no impact on the lifting yoke or any other SSC, this activity would not increase the possibility of a new malfunction.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this activity. This proposed activity will not adversely affect the ability of the lifting yoke to perform its intended design function. No new accident scenarios are created as the result of this proposed activity.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a lifting yoke beams maximum spacing non conformance. BGE approved this non conformance prior to the issuance of the ISFSI license in November, 1992. There is no change in the performance or in the operation of the lifting yoke as a result of this proposed activity. The lifting yoke beams maximum spacing non conformance does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. There is no change in the performance or in the operation of the lifting yoke as a result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Lifting Yoke Beams Maximum Spacing Non Conformance			72.48 Log No.: SE00076	
D4-LY-3; 73/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI non conformance that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a non conformance with the lifting yoke beams maximum spacing identified during fabrication.

Reason for Activity: This non conformance was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification.
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Air Flow				72.48 Log No.: SE00077
A-HSM-6; 74/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Air Flow				72.48 Log No.: SE00077
A-HSM-6; 74/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses the air flow openings for the HSM.

Reason for Activity: This safety evaluation addresses a difference between the NRC SER and the ISFSI USAR in regard to Horizontal Storage Module (HSM) air flow. The SER states that air enters each HSM through two inlets. This differs from the USAR description which states that air enters each HSM through one inlet.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Air Flow				72.48 Log No.: SE00077
A-HSM-6; 74/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the identified difference between the NRC SER and the ISFSI USAR with regard to HSM air flow. The NRC SER states in Section 2.2.6.1.2 that each HSM has two air inlets. The ISFSI USAR states in Section 4.3.1 that each HSM has one air inlet. Both documents are in agreement that each HSM has two outlets and rely on convective cooling by natural circulation. BGE Dwg. No. 84-081-E, Rev. 0, HSM Concrete Sections, clearly indicates that there is only one air inlet per HSM. In addition, a site tour confirmed that, as constructed, there are one inlet and two outlets for each HSM. The justification for one air inlet and two air outlets can be found in the Pacific Nuclear Fuel Services calculation BGE001.0407. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. This clarification has no detrimental impact on equipment important to safety. Therefore, this clarification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this activity. One accident scenario involves the complete and total blockage of the one air inlet and two air outlets for one HSM for a period of 48 hours, which would result in increased heating of the DSC and HSM due to loss of natural convection cooling. The justification for one air inlet and two air outlets can be found in the Pacific Nuclear Fuel Services calculation BGE001.0407. In addition, each HSM is monitored by security cameras, which looks at the inlets and outlets for any blockage. Any detected debris is removed by qualified site personnel. Also, ISFSI TS 3/4.4.1 requires, as a minimum, an inspection of the inlets and outlets every 24 hours to ensure that are free of obstructions when there is fuel in the HSM. And finally, the ISFSI perimeter fence and the separation of the air inlet from the air outlets, in addition to the other design features mentioned above, will ensure that the probability of occurrence of this accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, the blockage of air inlets and outlets accident scenario is not affected by this activity, and as such, the consequences of the accident as described in ISFSI USAR Section 8.2.7.3 would not be increased.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Air Flow				72.48 Log No.: SE00077
A-HSM-6; 74/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. After a thorough and intense review, it was concluded that this activity will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
3/4.4	This technical specification addresses the maximum allowable temperature rise from the HSM inlet to the HSM outlets. The USAR surveillance requirement requires that each HSM be visually inspected every 24 hours to verify that the air inlet and outlets are free from obstructions when there is fuel in the HSM. The technical specification also allows temporary forced ventilation should the maximum allowable temperature rise be exceeded. The blockage of the air inlet and outlets accident scenario is not affected by this activity. As such, this proposed activity will not reduce this margin of safety.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. This clarification has no detrimental impact on equipment important to safety, and does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Air Flow				72.48 Log No.: SE00077
A-HSM-6; 74/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses the air flow openings for the HSM.

Reason for Activity: This safety evaluation addresses a difference between the NRC SER and the ISFSI USAR in regard to Horizontal Storage Module (HSM) air flow. The SER states that air enters each HSM through two inlets. This differs from the USAR description which states that air enters each HSM through one inlet.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Contact Dose Rates				72.48 Log No.: SE00078
A-HSM-7; 75/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan III
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/2/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Contact Dose Rates			72.48 Log No.: SE00078
A-HSM-7; 75/129;	ES199601368	Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses Horizontal Storage Module (HSM) contact dose rate.

Reason for Activity: This safety evaluation addresses a difference between the NRC SER and the ISFSI USAR in regard to Horizontal Storage Module (HSM) air flow. The SER states that the design criterion for the contact dose rate on the HSM exterior surfaces (those surfaces away from the door) are less than the design for the NUHOMS-24P Topical Report. This differs from the USAR which states that the design criteria is the same as the NUHOMS-24P Topical Report.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Contact Dose Rates				72.48 Log No.: SE00078
A-HSM-7; 75/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the identified difference between the NRC SER and the ISFSI USAR with regard to HSM contact dose rate. The NRC SER states in Section 2.2.8.1 that the design criteria for the contact dose rate on the HSM exterior surfaces away from the door or penetrations is 15 mrem/hr or less, which is less than the Topical Report which cited 20 mrem/hr. The ISFSI USAR states in Section 7.1.2 that the Topical Report contact dose rate is used. The justification for this difference is that this HSM design was used by BGE to ensure consistency with the NRC approved Topical Report. The Topical Report is the design basis used in preparation of the CCNPP site specific ISFSI USAR. This contact rate was selected to maintain ALARA exposure to the general public and to on-site personnel working around the HSM. There was no justification provided in the NRC SER for their more conservative 15 mrem/hr contact dose rate. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. This clarification has no detrimental impact on equipment important to safety. Therefore, this clarification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this difference between the NRC SER and the ISFSI USAR. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM, and as such, the consequences of an accident would not be increased.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Contact Dose Rates				72.48 Log No.: SE00078
A-HSM-7; 75/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. After a thorough and intense review, it was concluded that this activity will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
2.4	This technical specification states the contact dose rate on the surface of the HSM sides shall not exceed 20 mrem/hr. Since this activity is a clarification of the 20 mrem/hr contact dose rate and no physical changes will occur as a result of this activity, the margin of safety is not reduced.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. This clarification has no detrimental impact on equipment important to safety, and does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. This ISFSI change does not involve the ISFSI Updated Environmental Report or deal with any environmental issues.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Contact Dose Rates				72.48 Log No.: SE00078
A-HSM-7; 75/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses Horizontal Storage Module (HSM) contact dose rate.

Reason for Activity: This safety evaluation addresses a difference between the NRC SER and the ISFSI USAR in regard to Horizontal Storage Module (HSM) air flow. The SER states that the design criterion for the contact dose rate on the HSM exterior surfaces (those surfaces away from the door) are less than the design for the NUHOMS-24P Topical Report. This differs from the USAR which states that the design criteria is the same as the NUHOMS-24P Topical Report.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforced Concrete Load Combinations				72.48 Log No.: SE00079
A-HSM-9; 76/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-14-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemone Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforced Concrete Load Combinations			72.48 Log No.: SE00079	
A-HSM-9; 76/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses Horizontal Storage Module (HSM) reinforced concrete load combinations.

Reason for Activity: This safety evaluation addresses a difference between the NRC SER and the ISFSI USAR in regard to Horizontal Storage Module (HSM) reinforced concrete load combinations.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforced Concrete Load Combinations				72.48 Log No.: SE00079
A-HSM-9; 76/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this proposed activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the identified difference between the NRC SER and the ISFSI USAR with regard to HSM reinforced concrete load combinations. The NRC SER states in Table 2.2.3-1 omission of an ANSI 57.9 load combination is not acceptable unless tornado missile loadings and a drop of the HSM access door are acceptably analyzed. The omitted load combination of ANSI 57.9, Paragraph 6.17.3.1(f) is D+L+H+T+A, where D= Dead Weight x 1.05, L= Live Load, H= Lateral Soil Pressure Loads, T= Normal Condition Thermal Load, A= Accident (e.g. drop accident). The SER also states that the HSM load combinations shown in the SAR are considered to be acceptable, except that tornado missile forces are not included. These forces are of the nature of other "accident" forces and could therefore be treated by substituting the missile impact forces (with appropriate dynamic analysis) for the E, or earthquake, in load combination 5 and 6. Based on the following acceptable substitutions for current approved SAR load combination calculations, W (tornado wind loads) can be used as an accident load, or A. Currently, combination 3,4 of the ISFSI USAR (table 8.2-11) is: 0.75(1.4D + 1.7L + 1.7H + 1.7T + 1.7W) = 1.05D + 1.275L + 1.275H + 1.275T + 1.275W. Substitute A for W and the result is: 1.05D + 1.275L + 1.275H + 1.275T + 1.275A, which exceeds the load combination omitted in the ISFSI USAR of D + L + H + T + A. Also, substituting A (accident load) for E (earthquake load) in combination 5,6 (of ISFSI USAR table 8.2-11) will yield the omitted load combination as well. The SER also states that the SAR is very conservative in that combining forces, all forces are assumed to be positive and additive regardless of point and direction of occurrence in the structural component. The (NRC) staff does not consider that this method of load combination is necessary for the monolithic HSM since: (1) multiple concurrent missile strikes need not be assumed, and (2) the analysis of resistance capability does not include the capability of adjacent members to assume load on any initiation of yield in a single wall or roof panel. As a result, the treatment of the tornado missile forces is considered to be acceptable. Although the ISFSI USAR does not list the ANSI 57.9 Load Combination calculation for tornado missile loading, based on the above analysis, it can be seen that tornado missile loading is in fact analyzed in the ISFSI USAR. The omission of the load combination is covered by enveloping NRC approved allowable substitutions. Additionally, the HSM has been analyzed to withstand tornado wind loads and tornado generated missiles (reference ISFSI USAR section 8.2.2.2.A). Therefore, the HSM Enveloping Load Calculation Results found in the ISFSI USAR in Table 8.2-11 are acceptable for analyzing tornado missile loadings. The SER also states that the HSM structural design criteria, the load combinations, and the final design of the HSM as represented in the current docketed material is considered to be structurally acceptable.

The HSM access door was analyzed and documented in section 8.1.1.6 of the Topical Report, which is referenced in section 8.1.1.6 of the ISFSI USAR. This section of the Topical Report discusses that the door was designed for the worst normal operating load, which was assumed to be three times the dead weight of the door acting on the bottom angle section of the door frame. The normal operating loads on the door are much lower than the design allowables. Additionally, the HSM door is designed to withstand tornado wind loads and tornado generated missiles (reference ISFSI USAR section 8.2.2.2.C and Topical Report section 8.2.2.2.C). The above is an acceptable analysis for design of the HSM access door.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforced Concrete Load Combinations				**72.48 Log No.: SE00079**
A-HSM-9; 76/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 4 of 5**

This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM. This clarification has no detrimental impact on equipment important to safety. Therefore, this clarification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this difference between the NRC SER and the ISFSI USAR. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. This safety evaluation clarifies an existing condition and does not change the original design or operation of the HSM, and as such, the consequences of the accident would not be increased.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforced Concrete Load Combinations	**72.48 Log No.: SE00079**
A-HSM-9; 76/129; ES199601368 Supplement 001 Revision 0000	**Page 5 of 5**

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. This Safety Evaluation clarifies an existing condition and does not change the original design or operation of the HSM. This clarification has no detrimental impact on equipment important to safety, and does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. This ISFSI change does not affect the ISFSI Updated Environmental Report or deal with any environmental issues.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To reconcile one identified difference between the NRC Safety Evaluation Report (SER) and the BGE Independent Spent Fuel Storage Installation (ISFSI) Updated Safety Analysis Report (USAR). This particular safety evaluation addresses Horizontal Storage Module (HSM) reinforced concrete load combinations.

Reason for Activity: This safety evaluation addresses a difference between the NRC SER and the ISFSI USAR in regard to Horizontal Storage Module (HSM) reinforced concrete load combinations.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Shield Heat Bolts Design Change				72.48 Log No.: SE00080
D3-HSM-1; 77/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Shield Heat Bolts Design Change			72.48 Log No.: SE00080	
D3-HSM-1; 77/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) roof heat shield bolts.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Shield Heat Bolts Design Change				72.48 Log No.: SE00080
D3-HSM-1; 77/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

<u>Complete for 50.59 and 72.48:</u>

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Probability of Malfunction:</u>

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the roof heat shield bolts design change. The subject activity changed the roof heat shield bolts from 48-1/2" diameter Maxibolts to 48-1/4" diameter Hilti Kwik bolts, which was documented in the heat shield details. The Hilti Kwik bolts are shown to be an acceptable substitution in calculation BGE001.0214. A review of that calculation shows that the maximum tensile load on the roof panels is only 49 lbs., and there are no calculated shear loads. Since the chosen Hilti Kwik bolts have an allowable tension of 520 lbs. and allowable shear of 470 lbs., there is adequate margin to support the total weight of the heat shield panels. The function of the heat shield panels is to reduce the HSM roof temperature to within acceptable limits for all conditions. Based on this information, the subject design change will not affect the form, fit or function of the HSM roof or roof shield, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Consequences of Malfunction:</u>

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

<u>Probability of Accident:</u>

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this activity. One accident scenario involves the loss of both air outlet shielding blocks from the top of one HSM. The Calvert Cliffs air outlet shielding blocks are designed to remain in place and withstand all design events including the effects of tornado missiles, and as such, this accident event is not applicable to Calvert Cliffs. This accident scenario is not affected by this design change, thus the probability of occurrence of this accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

<u>Consequences of Accident:</u>

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, the loss of both air outlet shielding blocks from the top of one HSM is not applicable to Calvert Cliffs, and as such, the consequences of the accident would not be increased.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Shield Heat Bolts Design Change			72.48 Log No.: SE00080	
D3-HSM-1; 77/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed the roof heat shield bolts from 48-1/2" diameter Maxibolts to 48-1/4" diameter Hilti Kwik bolts, which was documented in the heat shield details. The Hilti Kwik bolts are shown to be an acceptable substitution in calculation BGE001.0214. A review of that calculation shows that the maximum tensile load on the roof panels is only 49 lbs., and there are no calculated shear loads. Since the chosen Hilti Kwik bolts have an allowable tension of 520 lbs. and allowable shear of 470 lbs., there is adequate margin to support the total weight of the heat shield panels. The function of the heat shield panels is to reduce the HSM roof temperature to within acceptable limits for all conditions. Based on this information, the subject design change will not affect the form, fit or function of the HSM roof or roof shield, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. The subject design change will not affect the form, fit or function of the HSM roof or roof shield, and as such, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a roof heat shield bolts design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The roof heat shield bolts design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Shield Heat Bolts Design Change	72.48 Log No.: SE00080
D3-HSM-1; 77/129; ES199601368 Supplement 001 Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) roof heat shield bolts.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Temporary Hand Rails				72.48 Log No.: SE00081
D3-HSM-2; 78/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Temporary Hand Rails	**72.48 Log No.: SE00081**
D3-HSM-2; 78/129; ES199601368 Supplement 001 Revision 0000	**Page 2 of 5**

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) temporary hand rails.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Temporary Hand Rails				72.48 Log No.: SE00081
D3-HSM-2; 78/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no malfunctions of the HSM which are described or evaluated in the USAR as a result of the temporary hand rails design change. The subject activity added embedded angles for temporary hand rails. The temporary hand rails are non-safety related and have been added as an upgrade to the HSM for personnel safety. The hand rails are 8'-0" on center with each 6" x 6 "x 3/4" angle embedment plate anchored with four 1/2" diameter x 3-1/8" long Nelson studs. The location of the 24 embedments is shown on drawings 84-080-E and 84-095-E. Passive additions to concrete are within ACI Code practices. The embedded angles were added as permanent fixtures during the construction phase, whereas the handrails are inserted at locations on a temporary basis whenever personnel safety is required (i.e. roof inspections, etc.). Based on this information, the subject design change will not affect the form, fit or function of the HSM roof, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this activity. The subject design change will not affect the form, fit or function of the HSM roof, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no accidents to consider, and as such, the consequences of an accident would not be increased.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Temporary Hand Rails			72.48 Log No.: SE00081	
D3-HSM-2; 78/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity added embedded angles for temporary hand rails. The temporary hand rails are non-safety related and have been added as an upgrade to the HSM for personnel safety. The hand rails are 8'-0" on center with each 6" x 6 "x 3/4" angle embedment plate anchored with four 1/2" diameter x 3-1/8" long Nelson studs. The location of the 24 embedments is shown on drawings 84-080-E and 84-095-E. Passive additions to concrete are within ACI Code practices. The embedded angles were added as permanent fixtures during the construction phase, whereas the handrails are inserted at locations on a temporary basis whenever personnel safety is required (i.e. roof inspections, etc.). Based on this information, the subject design change will not affect the form, fit or function of the HSM roof, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a temporary hand rails design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The temporary hand rails design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Temporary Hand Rails	**72.48 Log No.: SE00081**
D3-HSM-2; 78/129; ES199601368 Supplement 001 Revision 0000	**Page 5 of 5**

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) temporary hand rails.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Secondary Roof Slopes in Front of Outlet Vents				72.48 Log No.: SE00082
D3-HSM-3; 79/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for ~~GS-DES~~, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .:______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Secondary Roof Slopes in Front of Outlet Vents	72.48 Log No.: SE00082
D3-HSM-3; 79/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) secondary roof slopes.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Secondary Roof Slopes in Front of Outlet Vents			72.48 Log No.: SE00082	
D3-HSM-3; 79/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the secondary roof slope design change. The subject activity removed the secondary roof slopes from the outlet vents. The original intent of the secondary slopes was to prevent water from entering the outlet vents. However, the outlet vents are nominally 5-1/2" above the primary roof surface. The elevation difference, along with the primary roof slope, prevents water from entering the vents. This design change simplified the roof construction by removing the unnecessary secondary roof slopes. Based on this information, the subject design change will not affect the form, fit or function of the HSM roof, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this activity. One accident scenario involves the loss of both air outlet shielding blocks from the top of one HSM. The Calvert Cliffs air outlet shielding blocks are designed to remain in place and withstand all design events including the effects of tornado missiles, and as such, this accident event is not applicable to Calvert Cliffs. This accident scenario is not affected by this design change, thus the probability of occurrence of this accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, the loss of both air outlet shielding blocks from the top of one HSM is not applicable to Calvert Cliffs, and as such, the consequences of the accident would not be increased.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Secondary Roof Slopes in Front of Outlet Vents			72.48 Log No.: SE00082	
D3-HSM-3; 79/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity removed the secondary roof slopes from the outlet vents. The original intent of the secondary slopes was to prevent water from entering the outlet vents. However, the outlet vents are nominally 5-1/2" above the primary roof surface. The elevation difference, along with the primary roof slope, prevents water from entering the vents. This design change simplified the roof construction by removing the unnecessary secondary roof slopes. Based on this information, the subject design change will not affect the form, fit or function of the HSM roof, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. The subject design change will not affect the form, fit or function of the HSM roof, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a secondary roof slope design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The secondary roof slope design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Secondary Roof Slopes in Front of Outlet Vents				72.48 Log No.: SE00082
D3-HSM-3; 79/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) secondary roof slopes.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Finish Requirements			**72.48 Log No.: SE00083**	
D3-HSM-4; 80/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 1 of 5**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk
PRINTED NAME AND SIGNATURE
Department: NED-CEU 42-01-04 Date: 11·7·97

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
11/12/97 SIGNATURE / DATE	11/10/97 SIGNATURE / DATE	11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: M.A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12·1·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: ______ Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: ______ Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: J R Lemon Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Finish Requirements				72.48 Log No.: SE00083
D3-HSM-4; 80/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) roof finish requirements.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Finish Requirements				72.48 Log No.: SE00083
D3-HSM-4; 80/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the roof finish requirements design change. The subject activity clarified the roof finish requirements and provided a non-slip finish for safety. The design change was made to reduce the injury potential of personnel working on the HSM roof. The roof's formed surfaces meet the requirements of ACI 301-84, section 10.2. The roof slab is float finished in accordance with the requirements of ACI 301-84, section 11.7.2. ACI 301-84 is the specification for structural concrete for buildings. Based on this information, the subject design change will not affect the form, fit or function of the HSM roof, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this activity. One accident scenario involves the loss of both air outlet shielding blocks from the top of one HSM. The Calvert Cliffs air outlet shielding blocks are designed to remain in place and withstand all design events including the effects of tornado missiles, and as such, this accident event is not applicable to Calvert Cliffs. This accident scenario is not affected by this design change, thus the probability of occurrence of this accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, the loss of both air outlet shielding blocks from the top of one HSM is not applicable to Calvert Cliffs, and as such, the consequences of the accident would not be increased.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Finish Requirements				72.48 Log No.: SE00083
D3-HSM-4; 80/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity clarified the roof finish requirements and provided a non-slip finish for safety. The design change was made to reduce the injury potential of personnel working on the HSM roof. The roof's formed surfaces meet the requirements of ACI 301-84, section 10.2. The roof slab is float finished in accordance with the requirements of ACI 301-84, section 11.7.2. ACI 301-84 is the specification for structural concrete for buildings. Based on this information, the subject design change will not affect the form, fit or function of the HSM roof, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. The subject design change will not affect the form, fit or function of the HSM roof, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a roof finish requirements design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The roof finish requirements design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof Finish Requirements	**72.48 Log No.: SE00083**
D3-HSM-4; 80/129; ES199601368 Supplement 001 Revision 0000	**Page 5 of 5**

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) roof finish requirements.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Inlet & Outlet Screens				72.48 Log No.: SE00084
D3-HSM-5; 81/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER
Date 11/14/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-14-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Inlet & Outlet Screens			72.48 Log No.: SE00084	
D3-HSM-5; 81/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) inlet and outlet screens.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Inlet & Outlet Screens				72.48 Log No.: SE00084
D3-HSM-5; 81/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the inlet and outlet screens design change. The subject activity added security/bird screens on the inlet and outlet vents. The intent of this design change is to reduce the amount of debris within the HSM and help maintain security within the ISFSI. The design change added angle frames, an intrusion screen, and an insect screen to the inlet and outlet openings. The security/bird screens include a 16 x 16 SS mesh insect screen separated from a 1" x1/8" bar grating security/bird screen by at least 1/2". The effect of the screens on the air flow through the HSM is that the DSC shell temperature will increase slightly. As determined in calculation BGE001.0409, the increase will range from 0.3°F to 2.5°F for all ambient temperatures. The temperature increase will have negligible impact on the HSM concrete and fuel cladding temperatures (Concrete normal temperature will increase from 150°F to 153°F, and the off-normal temperature will increase from 194°F to 197°F. Per ACI 349-90, the normal allowable temperature is 200°F, and the off-normal allowable temperature is 350°F. For fuel cladding, normal temperature will increase from 618°F to 621°F, and the off-normal temperature will increase from 732°F to 735°F. Per calculation BGE001.0403, the normal allowable and the off-normal allowable temperature is 1058°F). Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of this activity. One accident scenario involves the complete and total blockage of the one air inlet and two air outlets for one HSM for a period of 48 hours, which would result in increased heating of the DSC and HSM due to loss of natural convection cooling. The justification for one air inlet and two air outlets can be found in the Pacific Nuclear Fuel Services calculation BGE001.0407. In addition, each HSM is monitored by security cameras, which looks at the inlets and outlets for any blockage. Any detected debris is removed by qualified site personnel. In addition, ISFSI TS 3/4.4.1 requires, as a minimum, an inspection of the inlets and outlets every 24 hours to ensure that are free of obstructions when there is fuel in the HSM. The addition of the screens will affect the air flow through the HSM in that the DSC shell temperature will increase slightly. As determined in calculation BGE001.0409, the increase will range from 0.3°F to 2.5°F for all ambient temperatures. The temperature increase will have negligible impact on the HSM concrete and fuel cladding temperatures. This will not increase the probability of complete and total blockage, however, in that the design features as mentioned above, in addition to an ISFSI perimeter fence and the separation of the air inlet from the

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Inlet & Outlet Screens				72.48 Log No.: SE00084
D3-HSM-5; 81/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

from the air outlets, will ensure that the probability of occurrence of this accident previously evaluated in the SAR will not be increased as a result of this activity.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, the blockage of air inlets and outlets accident scenario is not affected by this activity, and as such, the consequences of the accident as described in ISFSI USAR Section 8.2.7.3 would not be increased.

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity added security/bird screens on the inlet and outlet vents. The intent of this design change is to reduce the amount of debris within the HSM and help maintain security within the ISFSI. The design change added angle frames, an intrusion screen, and an insect screen to the inlet and outlet openings. The security/bird screens include a 16 x 16 SS mesh insect screen separated from a 1" x1/8" bar grating security/bird screen by at least 1/2". The effect of the screens on the air flow through the HSM is that the DSC shell temperature will increase slightly. As determined in calculation BGE001.0409, the increase will range from 0.3°F to 2.5°F for all ambient temperatures. The temperature increase will have negligible impact on the HSM concrete and fuel cladding temperatures. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases	Discussion of why the margin of safety is not reduced
3/4.4	This technical specification addresses the maximum allowable temperature rise from the HSM inlet to the HSM outlets. The USAR surveillance requirement requires that each HSM be visually inspected every 24 hours to verify that the air inlet and outlets are free from obstructions when there is fuel in the HSM. The technical specification also allows temporary forced ventilation should the maximum allowable temperature rise be exceeded. The blockage of the air inlet and outlets accident scenario is not affected by this activity. As such, this proposed activity will not reduce this margin of safety.

After a thorough review, it was concluded that this activity would reduce the margin of safety as defined in the basis for any ISFSI Technical Specification.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Inlet & Outlet Screens				72.48 Log No.: SE00084
D3-HSM-5; 81/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a inlet and outlet screens design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The inlet and outlet screens design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) inlet and outlet screens.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Cask Restraint Design Change				72.48 Log No.: SE00085
D3-HSM-6; 82/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/14/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-14-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Remeniuk Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Cask Restraint Design Change			72.48 Log No.: SE00085	
D3-HSM-6; 82/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) cask restraint.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Cask Restraint Design Change				72.48 Log No.: SE00085
D3-HSM-6; 82/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the cask restraint design change. The subject activity replaced the cask restraint eyebolt and modified the HSM block out for the TC restraint. The block outs were changed from 9" tall trapezoids to 7-7/8" tall triangles. The eyebolts were changed from 2" diameter ASTM A-489 with a rated capacity of 26,000 lbs. to a 1-1/2" diameter turnbuckle eye with a jam nut with a safe working load of 21,400 lbs. and a safety factor of 5 to the ultimate load. The length of the embedded rod was reduced from 36" to 23" (This change in embedment length met the requirements of ACI 349-90, Appendix B - Steel Embedments). In addition, Calculation BGE001.0220, HSM Cask Restraint, confirmed the adequacy of this design change. The intent of the design change was to correct a clearance problem with the TC / HSM restraint. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios involve the HSM cask restraint.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Cask Restraint Design Change				72.48 Log No.: SE00085
D3-HSM-6; 82/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity replaced the cask restraint eyebolt and modified the HSM block out for the TC restraint. The block outs were changed from 9" tall trapezoids to 7-7/8" tall triangles. The eyebolts were changed from 2" diameter ASTM A-489 with a rated capacity of 26,000 lbs. to a 1-1/2" diameter turnbuckle eye with a jam nut with a safe working load of 21,400 lbs. and a safety factor of 5 to the ultimate load. The length of the embedded rod was reduced from 36" to 23" (This change in embedment length met the requirements of ACI 349-90, Appendix B - Steel Embedments). In addition, Calculation BGE001.0220, HSM Cask Restraint, confirmed the adequacy of this design change. The intent of the design change was to correct a clearance problem with the TC / HSM restraint. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a cask restraint design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The cask restraint design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Cask Restraint Design Change				**72.48 Log No.: SE00085**
D3-HSM-6; 82/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 5 of 5**

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) cask restraint.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Slab Edge Bars				72.48 Log No.: SE00086
D3-HSM-7; 83/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: .:__________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Slab Edge Bars				72.48 Log No.: SE00086
D3-HSM-7; 83/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) slab edge bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Slab Edge Bars				72.48 Log No.: SE00086
D3-HSM-7; 83/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no malfunctions of the HSM which are described or evaluated in the USAR as a result of the slab edge bars design change. The subject activity allowed the slab edge bars to be placed on either side of the #10 main bars to maintain 2" minimum cover. This design change simplified the construction of the HSM. It meets the minimum concrete slab cover requirements of ACI 318-89, section 7.7.1, which states that reinforcing bars No. 6 through No. 18 that reinforce concrete exposed to the earth or weather require a minimum concrete cover of 2 inches. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Slab Edge Bars			72.48 Log No.: SE00086	
D3-HSM-7; 83/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity allowed the slab edge bars to be placed on either side of the #10 main bars to maintain 2" minimum cover. This design change simplified the construction of the HSM. It meets the minimum concrete slab cover requirements of ACI 318-89, section 7.7.1, which states that reinforcing bars No. 6 through No. 18 that reinforce concrete exposed to the earth or weather require a minimum concrete cover of 2 inches. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a slab edge bars design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The slab edge bars design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Slab Edge Bars				72.48 Log No.: SE00086
D3-HSM-7; 83/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) slab edge bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Welded Wire Fabric Design Change			**72.48 Log No.: SE00087**	
D3-HSM-8; 84/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 1 of 5**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk
PRINTED NAME AND SIGNATURE
Department: NED-CEU 42-01-04 Date: 11-7-97

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
11/12/97 SIGNATURE / DATE	11/10/97 SIGNATURE / DATE	11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: M.A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: ______ Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: ______ Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: ______ Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .:______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Welded Wire Fabric Design Change			72.48 Log No.: SE00087	
D3-HSM-8; 84/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) welded wire fabric.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Welded Wire Fabric Design Change			72.48 Log No.: SE00087	
D3-HSM-8; 84/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no malfunctions of the HSM which are described or evaluated in the USAR as a result of the welded wire fabric design change. The subject activity allowed the use of an alternate wire mesh (WWF 6x6-D10xD10 deformed bar) instead of the original mesh wire (WWF 6x6-W10xW10) called out in the plan views of the roof vent cover. This design change was incorporated because the alternate wire mesh has better bend characteristics and is more easily obtained. Per ACI 439.4R (Steel Reinforcement - Physical Properties and U.S. Availability), both wire meshes have the same reinforcing characteristics for the concrete. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. The subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Welded Wire Fabric Design Change	72.48 Log No.: SE00087
D3-HSM-8; 84/129; ES199601368 Supplement 001 Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity allowed the use of an alternate wire mesh (WWF 6x6-D10xD10 deformed bar) instead of the original mesh wire (WWF 6x6-W10xW10) called out in the plan views of the roof vent cover. This design change was incorporated because the alternate wire mesh has better bend characteristics and is more easily obtained. Per ACI 439.4R (Steel Reinforcement - Physical Properties and U.S. Availability), both wire meshes have the same reinforcing characteristics for the concrete. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a welded wire fabric design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The welded wire fabric design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Welded Wire Fabric Design Change			72.48 Log No.: SE00087	
D3-HSM-8; 84/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) welded wire fabric.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Rotation				72.48 Log No.: SE00088
D3-HSM-9; 85/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Rotation				72.48 Log No.: SE00088
D3-HSM-9; 85/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Rotation			72.48 Log No.: SE00088	
D3-HSM-9; 85/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC46 bar rotation design change. The subject activity allows an alternative 180 degree rotation of the 10CC46 reinforcing bar so that the 45 degree bends are located over the wall concrete sections. The change made to simplify construction, and the area of steel reinforcement remains the same. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. The design change made to simplify construction, and the area of steel reinforcement remains the same. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Rotation				72.48 Log No.: SE00088
D3-HSM-9; 85/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity allows an alternative 180 degree rotation of the 10CC46 reinforcing bar so that the 45 degree bends are located over the wall concrete sections. The change made to simplify construction, and the area of steel reinforcement remains the same. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC46 bar rotation design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC46 bar rotation design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Rotation			72.48 Log No.: SE00088	
D3-HSM-9; 85/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Splice Length				72.48 Log No.: SE00089
D3-HSM-10; 86/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/14/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-14-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Splice Length			72.48 Log No.: SE00089	
D3-HSM-10; 86/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Splice Length			72.48 Log No.: SE00089	
D3-HSM-10; 86/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC47 bar splice length design change. The subject activity allowed the 10CC47 splice length to be reduced by 12", if required, to provide the 2" minimum concrete cover. In addition, the excess length of the bar splices were removed to ease construction congestion. It meets the minimum concrete slab cover requirements of ACI 318-89, which states that reinforcing bars No. 6 through No. 18 that reinforce concrete exposed to the earth or weather require a minimum concrete cover of 2 inches. It also meets the ACI 318-89 splice requirements for reinforcing steel. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Splice Length				72.48 Log No.: SE00089
D3-HSM-10; 86/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity allowed the 10CC47 splice length to be reduced by 12", if required, to provide the 2" minimum concrete cover. In addition, the excess length of the bar splices were removed to ease construction congestion. It meets the minimum concrete slab cover requirements of ACI 318-89, which states that reinforcing bars No. 6 through No. 18 that reinforce concrete exposed to the earth or weather require a minimum concrete cover of 2 inches. It also meets the ACI 318-89 splice requirements for reinforcing steel. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC47 bar splice length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC47 bar splice length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Splice Length				**72.48 Log No.: SE00089**
D3-HSM-10; 86/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 5 of 5**

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Rotation				72.48 Log No.: SE00090
D3-HSM-11; 87/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk
PRINTED NAME AND SIGNATURE
Department: NED-CEU 42-01-04 Date: 11-7-97

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
11/12/97 SIGNATURE / DATE	11/10/97 SIGNATURE / DATE	11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: M.A. CARR
INDEPENDENT REVIEWER
Date 11/13/97

Approved Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: ______ Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: ______ Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: ______ Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Rotation				72.48 Log No.: SE00090
D3-HSM-11; 87/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Rotation				72.48 Log No.: SE00090
D3-HSM-11; 87/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC47 bar rotation design change. The subject activity allows an alternative 90 degree rotation of the 10CC47 reinforcing bar to simplify construction, while the area of steel reinforcement remains the same. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Rotation				72.48 Log No.: SE00090
D3-HSM-11; 87/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity allows an alternative 90 degree rotation of the 10CC47 reinforcing bar to simplify construction, while the area of steel reinforcement remains the same. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC47 bar rotation design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC47 bar rotation design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 Bar Rotation				72.48 Log No.: SE00090
D3-HSM-11; 87/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Bend				72.48 Log No.: SE00091
D3-HSM-12; 88/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/14/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-14-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ____

Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____

Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Bend			72.48 Log No.: SE00091	
D3-HSM-12; 88/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Bend			72.48 Log No.: SE00091	
D3-HSM-12; 88/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC46 bar bend design change. The subject activity allows the 10CC46 reinforcing bar to be bent to clear 10CC7 dowels or cut and spliced to 10CC7 dowels, if required for installation. It meets the ACI 318-89 bend and splice requirements for reinforcing steel. The change was made to simplify construction, and the area of steel reinforcement remains the same. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Bend			72.48 Log No.: SE00091	
D3-HSM-12; 88/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity allows the 10CC46 reinforcing bar to be bent to clear 10CC7 dowels or cut and spliced to 10CC7 dowels, if required for installation. It meets the ACI 318-89 bend and splice requirements for reinforcing steel. The change was made to simplify construction, and the area of steel reinforcement remains the same. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC46 bar bend design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC46 bar bend design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC46 Bar Bend				72.48 Log No.: SE00091
D3-HSM-12; 88/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Location Change				72.48 Log No.: SE00092
D3-HSM-13; 89/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for ~~GS-DES~~, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: P Katz Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemone Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Location Change				72.48 Log No.: SE00092
D3-HSM-13; 89/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Location Change				72.48 Log No.: SE00092
D3-HSM-13; 89/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC7 bar location design change. The subject activity revised the location of the 10CC7 reinforcing bars in corners at elevation 114'-0". This change made to simplify HSM construction and does not affect the HSM design. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Location Change				72.48 Log No.: SE00092
D3-HSM-13; 89/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity revised the location of the 10CC7 reinforcing bars in corners at elevation 114'-0". This change made to simplify HSM construction and does not affect the HSM design. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC7 bar location design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC7 bar location design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Location Change				72.48 Log No.: SE00092
D3-HSM-13; 89/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Dowel Length				72.48 Log No.: SE00093
D3-HSM-14; 90/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for ~~GS-DES, GS-TES~~, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .:____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Dowel Length				72.48 Log No.: SE00093
D3-HSM-14; 90/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Dowel Length			72.48 Log No.: SE00093	
D3-HSM-14; 90/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC7 dowel length design change. The subject activity allowed the 10CC7 dowel to be cut 5' ± 6" above elevation 114'-0" to provide clearance for cask restraint and door frame embedments. The excess length of the dowel was removed to ease construction congestion in the front wall. The 10CC46 bar splices will provide the required load transfer mechanism to prevent cracking in the front face and satisfactorily transfer all loads. These changes meet the requirements of ACI 349-90 as described in Sections 7 and 12. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Dowel Length			72.48 Log No.: SE00093	
D3-HSM-14; 90/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity allowed the 10CC7 dowel to be cut 5' $\pm$ 6" above elevation 114'-0" to provide clearance for cask restraint and door frame embedments. The excess length of the dowel was removed to ease construction congestion in the front wall. The 10CC46 bar splices will provide the required load transfer mechanism to prevent cracking in the front face and satisfactorily transfer all loads. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC7 dowel length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC7 dowel length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Dowel Length				72.48 Log No.: SE00093
D3-HSM-14; 90/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof 8CC13 Bar Replacement				72.48 Log No.: SE00094
D3-HSM-15; 91/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M/A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature [signature] Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: .:____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof 8CC13 Bar Replacement			72.48 Log No.: SE00094	
D3-HSM-15; 91/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof 8CC13 Bar Replacement			72.48 Log No.: SE00094	
D3-HSM-15; 91/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 8CC13 bar replacement design change. The subject activity changed the location of the reinforcing bars for the roof plan at elevation 129'+0 for the phase 1A north side only, and the 8CC13 bars on top were replaced with 8CC113 and 8CC213 bars. The design of reinforcement placement is typically flexible so that field construction changes can be accommodated. This design change was necessary to clarify the bar placement requirements. The steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof 8CC13 Bar Replacement			72.48 Log No.: SE00094	
D3-HSM-15; 91/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed the location of the reinforcing bars for the roof plan at elevation 129'+0 for the phase 1A north side only, and the 8CC13 bars on top were replaced with 8CC113 and 8CC213 bars. The design of reinforcement placement is typically flexible so that field construction changes can be accommodated. This design change was necessary to clarify the bar placement requirements. The steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 8CC13 bar replacement design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 8CC13 bar replacement design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Roof 8CC13 Bar Replacement	72.48 Log No.: SE00094
D3-HSM-15; 91/129; ES199601368 Supplement 001 Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional #7 Bars To Front Edge Roof				72.48 Log No.: SE00095
D3-HSM-16; 92/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/1/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .:______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional #7 Bars To Front Edge Roof				72.48 Log No.: SE00095
D3-HSM-16; 92/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional #7 Bars To Front Edge Roof				72.48 Log No.: SE00095
D3-HSM-16; 92/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the additional #7 bars design change. The subject activity added additional #7 U-bars to the front edge of the roof. It was incorporated to satisfy the required steel reinforcing ratio of the concrete, since the original design had an inadequate number of bars in this area. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional #7 Bars To Front Edge Roof			72.48 Log No.: SE00095	
D3-HSM-16; 92/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity added additional #7 U-bars to the front edge of the roof. It was incorporated to satisfy the required steel reinforcing ratio of the concrete, since the original design had an inadequate number of bars. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a additional #7 bars design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The additional #7 bars design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional #7 Bars To Front Edge Roof				72.48 Log No.: SE00095
D3-HSM-16; 92/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Minimum Concrete Cover of Vertical Outlet Vent Rebar				72.48 Log No.: SE00096
D3-HSM-17; 93/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 12-15-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 12/15/97 SIGNATURE / DATE	[signature] 12/15/97 SIGNATURE / DATE	[signature] 12/15/97 SIGNATURE / DATE

Approved Disapproved Approved Disapproved

Signature: [signature] M.A. CARR Signature: Michael J. Gahan for GS-DES, GS-TES, or PE-PDSU
INDEPENDENT REVIEWER

Date 12/17/97 Date 12-22-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 98-006 Date: 1.14.98

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 1-14-98
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 1/14/98
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No ✓

Signature: [signature] Date: 4/15/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: .: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the minimum concrete cover for the HSM (Horizontal Storage Module) vertical outlet vent rebar. The subject activity provided an allowance for the minimum concrete cover for the vertical outlet vent rebar to be reduced from 2" to 1", if necessary. This design change was incorporated due to the tight bend required for the 8CC13 rebar at each outlet vent.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 6

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Minimum Concrete Cover of Vertical Outlet Vent Rebar			72.48 Log No.: SE00096	
D3-HSM-17; 93/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the minimum concrete cover of the vertical outlet vent rebar design change. The subject activity provided an allowance for the minimum concrete cover for the vertical outlet vent rebar to be reduced from 2" to 1", if necessary. This design change was incorporated due to the tight bend required for the 8CC13 rebar at each outlet vent. The closed loop rebar details originally specified a minimum concrete cover of 2" on all outlet vent surfaces. The reduced concrete cover applies only to the roof vertical side of each outlet vent, which is not exposed to the weather. The details of this rebar configuration can be found in Section F-F of BGE Drawing No. 84-087-E. This clearly shows the vertical configuration of the rebar and the protection provided by the outlet vent overhang (18", as shown in Section B-B of BGE Drawing No. 84-081-E). Additional protection is provided via the intrusion and insect screens at the outlet. Per ACI 318-89, section 7.7.1(c), concrete for walls and slabs not exposed to weather or in contact with the ground will require a minimum concrete cover of 3/4" for rebar size no. 11 and smaller (8CC13 is rebar size no. 8, which is in this category). Therefore, this design change to reduce the minimum concrete cover for the vertical outlet vent rebar only from 2" to 1" does meet the minimum concrete cover requirements of ACI 318-89. In addition, the area of steel reinforcement remains the same, and all ACI requirements are met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Minimum Concrete Cover of Vertical Outlet Vent Rebar			72.48 Log No.: SE00096	
D3-HSM-17; 93/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity provided an allowance for the minimum concrete cover for the vertical outlet vent rebar to be reduced from 2" to 1", if necessary. This design change was incorporated due to the tight bend required for the 8CC13 rebar at each outlet vent. The closed loop rebar details originally specified a minimum concrete cover of 2" on all outlet vent surfaces. The reduced concrete cover applies only to the roof vertical side of each outlet vent, which is not exposed to the weather. The details of this rebar configuration can be found in Section F-F of BGE Drawing No. 84-087-E. This clearly shows the vertical configuration of the rebar and the protection provided by the outlet vent overhang (18", as shown in Section B-B of BGE Drawing No. 84-081-E). Additional protection is provided via the intrusion and insect screens at the outlet. Per ACI 318-89, section 7.7.1(c), concrete for walls and slabs not exposed to weather or in contact with the ground will require a minimum concrete cover of 3/4" for rebar size no. 11 and smaller (8CC13 is rebar size no. 8, which is in this category). Therefore, this design change to reduce the minimum concrete cover for the vertical outlet vent rebar only from 2" to 1" does meet the minimum concrete cover requirements of ACI 318-89. In addition, the area of steel reinforcement remains the same, and all ACI requirements are met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a minimum concrete cover of the vertical outlet vent rebar design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The minimum concrete cover of the vertical outlet vent rebar design change does not adversely affect the operation or the associated occupational exposures as described in USAR Table 7.4-1.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Minimum Concrete Cover of Vertical Outlet Vent Rebar			72.48 Log No.: SE00096	
D3-HSM-17; 93/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the minimum concrete cover for the HSM (Horizontal Storage Module) vertical outlet vent rebar. The subject activity provided an allowance for the minimum concrete cover for the vertical outlet vent rebar to be reduced from 2" to 1", if necessary. This design change was incorporated due to the tight bend required for the 8CC13 rebar at each outlet vent.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC1 Carriage Bar Addition				72.48 Log No.: SE00097
D3-HSM-18; 94/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] PRINTED NAME AND SIGNATURE Department: NED-CEU 42-01-04 Date: 11-7-97

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: [signature]
for GS-DES/GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] POSRC CHAIRMAN Date 12-1-97

Approved ✓ Disapproved ______ Signature: [signature] PLANT GENERAL MANAGER Date 12/4/97

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] OSSRC SES CHAIRMAN Date: 1/30/98

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC1 Carriage Bar Addition				72.48 Log No.: SE00097
D3-HSM-18; 94/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC1 Carriage Bar Addition				72.48 Log No.: SE00097
D3-HSM-18; 94/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC1 carriage bar addition design change. The subject activity adds 10CC1 bars to act as carriage bars under the 8CC13 temperature steel in the roof slab. The sole purpose of these carriage bars is to support the reinforcing bars that will be used to help minimize the shrinkage of the roof concrete. The carriage bars help ensure that the temperature steel concrete cover will be consistently met throughout the roof. The steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC1 Carriage Bar Addition				72.48 Log No.: SE00097
D3-HSM-18; 94/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity adds 10CC1 bars to act as carriage bars under the 8CC13 temperature steel in the roof slab. The sole purpose of these carriage bars is to support the reinforcing bars that will be used to help minimize the shrinkage of the roof concrete. The carriage bars help ensure that the temperature steel concrete cover will be consistently met throughout the roof. The steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC1 carriage bar addition design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC1 carriage bar addition design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC1 Carriage Bar Addition				72.48 Log No.: SE00097
D3-HSM-18; 94/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Dimensional Changes				72.48 Log No.: SE00098
D3-HSM-19; 95/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/14/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Dimensional Changes			72.48 Log No.: SE00098	
D3-HSM-19; 95/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Dimensional Changes	72.48 Log No.: SE00098
D3-HSM-19; 95/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC7 bar dimensional design change. The subject activity deleted the 3" and 9" location dimensions for dowels 10CC7 for phases 1A and 1B only. This change was made to assure the correct reinforcing bar spacing is met. The location of the construction joint is permitted to float +/- 6" and dimensioning the bars from the joint does not ensure the required bar spacing of 12". Deleting the 3" and 9" dimensions clarifies the drawing requirements. This change made to simplify HSM construction and does not affect the HSM design. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Dimensional Changes				72.48 Log No.: SE00098
D3-HSM-19; 95/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity deleted the 3" and 9" location dimensions for dowels 10CC7 for phases 1A and 1B only. This change was made to assure the correct reinforcing bar spacing is met. The location of the construction joint is permitted to float +/- 6" and dimensioning the bars from the joint does not ensure the required bar spacing of 12". Deleting the 3" and 9" dimensions clarifies the drawing requirements. This change made to simplify HSM construction and does not affect the HSM design. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC7 bar dimensional design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC7 bar dimensional design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC7 Bar Dimensional Changes				72.48 Log No.: SE00098
D3-HSM-19; 95/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional Reinforcing Steel				72.48 Log No.: SE00099
D3-HSM-20; 96/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye	Resp. Indv.: C. J. Dobry	Resp. Indv.: R. H. Beall
Work Group: Licensing	Work Group: PES	Work Group: NFM
[signature] 11/14/97	[signature] 11/10/97	[signature] 11/11/97
SIGNATURE / DATE	SIGNATURE / DATE	SIGNATURE / DATE

Approved (circled) Disapproved
Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER
Date 11/13/97

Approved (circled) Disapproved
Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-14-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional Reinforcing Steel				72.48 Log No.: SE00099
D3-HSM-20; 96/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, 8.2, and Appendix A - Drawings.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional Reinforcing Steel				72.48 Log No.: SE00099
D3-HSM-20; 96/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the additional reinforcing steel design change. The subject activity added reinforcing steel to the roof at exposed edges and adjacent to vents to meet maximum spacing requirements as defined in ACI-349, Nuclear Safety Structures Code. The original design had an inadequate number of bars as discovered during the NRC review of the original SAR submittal. This design change ensured the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional Reinforcing Steel				72.48 Log No.: SE00099
D3-HSM-20; 96/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity added reinforcing steel to the roof at exposed edges and adjacent to vents to meet maximum spacing requirements as defined in ACI-349, Nuclear Safety Structures Code. The original design had an inadequate number of bars as discovered during the NRC review of the original SAR submittal. This design change ensured the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a additional reinforcing steel design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The additional reinforcing steel design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Additional Reinforcing Steel	72.48 Log No.: SE00099
D3-HSM-20; 96/129; ES199601368 Supplement 001 Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforcing Steel Installation				72.48 Log No.: SE00100
D3-HSM-21; 97/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk
PRINTED NAME AND SIGNATURE
Department: NED-CEU 42-01-04 Date: 11-7-97

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
11/12/97 SIGNATURE / DATE	11/10/97 SIGNATURE / DATE	11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: M. A CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature:
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: ______ Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: ______ Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: ______ Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforcing Steel Installation				72.48 Log No.: SE00100
D3-HSM-21; 97/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforcing Steel Installation	72.48 Log No.: SE00100
D3-HSM-21; 97/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the reinforcing steel installation design change. The subject activity ensured the front face of the HSM's were adequately reinforced by placing the reinforcing at the minimum concrete cover location. This change was made to simplify HSM construction, in that the design of reinforcement placement is typically flexible and most field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforcing Steel Installation				72.48 Log No.: SE00100
D3-HSM-21; 97/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity ensured the front face of the HSM's were adequately reinforced by placing the reinforcing at the minimum concrete cover location. This change was made to simplify HSM construction, in that the design of reinforcement placement is typically flexible and most field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a reinforcing steel installation design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The reinforcing steel installation design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Reinforcing Steel Installation	72.48 Log No.: SE00100
D3-HSM-21; 97/129; ES199601368 Supplement 001 Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM #8 Bar Added For Crack Control			72.48 Log No.: SE00101	
D3-HSM-22; 98/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12-1-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM #8 Bar Added For Crack Control				72.48 Log No.: SE00101
D3-HSM-22; 98/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM #8 Bar Added For Crack Control				72.48 Log No.: SE00101
D3-HSM-22; 98/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the #8 bar added for crack control design change. The subject activity added an additional #8 bar to reinforce the corner between the top of the foundation mat and underside of access sleeve for the 1A unit only. This change was made to provide required crack control since the 10CC47 installed with a 45 degree bend turned outward did not provide the required crack control. The #8 bar was therefore added to reinforce the corner. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM #8 Bar Added For Crack Control				72.48 Log No.: SE00101
D3-HSM-22; 98/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity added an additional #8 bar to reinforce the corner between the top of the foundation mat and underside of access sleeve for the 1A unit only. This change was made to provide required crack control since the 10CC47 installed with a 45 degree bend turned outward did not provide the required crack control. The #8 bar was therefore added to reinforce the corner. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a #8 bar added for crack control design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The #8 bar added for crack control design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM #8 Bar Added For Crack Control				72.48 Log No.: SE00101
D3-HSM-22; 98/129;	ES199601368	Supplement 001	Revision 0000	

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 5CC69 Bars Added For Crack Control				72.48 Log No.: SE00102
D3-HSM-23; 99/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M.A.CHE
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: ____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 5CC69 Bars Added For Crack Control			72.48 Log No.: SE00102	
D3-HSM-23; 99/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 5CC69 Bars Added For Crack Control	72.48 Log No.: SE00102
D3-HSM-23; 99/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the #5 bars added for crack control design change. The subject activity added additional #5 reinforcing bars 5CC69 to the HSM face to provide the required crack control. Although cracking can not be expected to be eliminated, it is generally more desirable to have many fine hair cracks than a few wide cracks. Thus crack control is a matter of controlling the distribution and size of cracks rather than eliminating them. To control cracking, it is better to use several smaller bars at moderate spacing than larger bars of equivalent area. This change added 48 #5 bars, which should provide good crack control. ACI 318-89, section 10.6 provides crack control provisions for beams and one way slabs. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 5CC69 Bars Added For Crack Control	72.48 Log No.: SE00102
D3-HSM-23; 99/129; ES199601368 Supplement 001 Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity added additional #5 reinforcing bars 5CC69 to the HSM face to provide the required crack control. Although cracking can not be expected to be eliminated, it is generally more desirable to have many fine hair cracks than a few wide cracks. Thus crack control is a matter of controlling the distribution and size of cracks rather than eliminating them. To control cracking, it is better to use several smaller bars at moderate spacing than larger bars of equivalent area. This change added 48 #5 bars, which should provide good crack control. ACI 318-89, section 10.6 provides crack control provisions for beams and one way slabs. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a #5 bars added for crack control design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The #5 bars added for crack control design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 5CC69 Bars Added For Crack Control				72.48 Log No.: SE00102
D3-HSM-23; 99/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 7CC64 Through 7CC68 Bar Locations Clarification	72.48 Log No.: SE00103
D3-HSM-24; 100/129; ES199601368 Supplement 001 Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, DS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 7CC64 Through 7CC68 Bar Locations Clarification	72.48 Log No.: SE00103
D3-HSM-24; 100/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 7CC64 Through 7CC68 Bar Locations Clarification			72.48 Log No.: SE00103	
D3-HSM-24; 100/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 7CC64 through 7C68 bar locations design change. The subject activity defined the location of bars 7CC64 through 7CC68 since the bar locations were not completely specified on the design drawings. The change was made to simplify construction, and the area of steel reinforcement remains the same. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 7CC64 Through 7CC68 Bar Locations Clarification			72.48 Log No.: SE00103	
D3-HSM-24; 100/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity defined the location of bars 7CC64 through 7CC68 since the bar locations were not completely specified on the design drawings. The change was made to simplify construction, and the area of steel reinforcement remains the same. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 7CC64 through 7C68 bar locations design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 7CC64 through 7C68 bar locations design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 7CC64 Through 7CC68 Bar Locations Clarification			72.48 Log No.: SE00103	
D3-HSM-24; 100/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 8CC13 Bar Clearance Distance Change				72.48 Log No.: SE00104
D3-HSM-25; 101/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: [signature] M. A. CARR
INDEPENDENT REVIEWER

Date 11/13/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-136 Date: 12.1.97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-1-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12/4/97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 8CC13 Bar Clearance Distance Change			72.48 Log No.: SE00104	
D3-HSM-25; 101/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 8CC13 Bar Clearance Distance Change				72.48 Log No.: SE00104
D3-HSM-25; 101/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 8CC13 bar clearance distance design change. The subject activity reduced the clear distance between 8CC13 bars and the vent structure from 2" (typ) to 1" (min). The minimum clear distance was invoked to allow for bar fabrication cut and bend tolerance. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 8CC13 Bar Clearance Distance Change			72.48 Log No.: SE00104	
D3-HSM-25; 101/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity reduced the clear distance between 8CC13 bars and the vent structure from 2" (typ) to 1" (min). The minimum clear distance was invoked to allow for bar fabrication cut and bend tolerance. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 8CC13 bar clearance distance design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 8CC13 bar clearance distance design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 8CC13 Bar Clearance Distance Change			72.48 Log No.: SE00104	
D3-HSM-25; 101/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 6CC55 Through 10CC55 Bar Size Change			72.48 Log No.: SE00105	
D3-HSM-26; 102/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] PRINTED NAME AND SIGNATURE Department: NED-CEU 42-01-04 Date: 11-7-97

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature] INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature] for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] POSRC CHAIRMAN Date 12-3-97

Approved ✓ Disapproved ______ Signature: [signature] PLANT GENERAL MANAGER Date 12-3-97

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] OSSRC/SES CHAIRMAN Date: 1/30/98

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 6CC55 Through 10CC55 Bar Size Change			72.48 Log No.: SE00105	
D3-HSM-26; 102/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 6CC55 Through 10CC55 Bar Size Change			72.48 Log No.: SE00105	
D3-HSM-26; 102/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 6CC55 through 10CC55 bar size design change. The subject activity changes the bar size from 6CC55 to 10CC55 on the cut sheets only (bill of materials). This corrected an error on the bar cut and bend listing. The bar size was correctly specified on the layout drawing. (Note: Although this safety evaluation addresses the change of rebar from 6CC55 to 10CC55, another safety evaluation SE00106 addresses the deletion of 10CC55 from the cut sheets.) Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 6CC55 Through 10CC55 Bar Size Change			72.48 Log No.: SE00105	
D3-HSM-26; 102/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changes the bar size from 6CC55 to 10CC55 on the cut sheets only (bill of materials). This corrected an error on the bar cut and bend listing. The bar size was correctly specified on the layout drawing. (Note: Although this safety evaluation addresses the change of rebar from 6CC55 to 10CC55, another safety evaluation SE00106 addresses the deletion of 10CC55 from the cut sheets.) Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 6CC55 through 10CC55 bar size design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 6CC55 through 10CC55 bar size design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 6CC55 Through 10CC55 Bar Size Change				72.48 Log No.: SE00105
D3-HSM-26; 102/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Bars 9CC34 & 10CC55 Deleted				72.48 Log No.: SE00106
D3-HSM-27; 103/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved | Approved Disapproved

Signature: JA CRUNKLETON [signature]
INDEPENDENT REVIEWER
Date 11/12/97

Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Bars 9CC34 & 10CC55 Deleted			72.48 Log No.: SE00106	
D3-HSM-27; 103/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Bars 9CC34 & 10CC55 Deleted				72.48 Log No.: SE00106
D3-HSM-27; 103/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the bars 9CC34 and 10CC55 deletion design change. The subject activity deleted rebar 9CC34 and 10CC55 on the cut sheets only (bill of materials). The deletion of the rebar occurred during the design review stage, thus the final detail drawings were accurate. This design change was made to make the rebar cut and bend lists consistent with the detail drawings. It was determined during the design review stage that this reinforcement was not required. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Bars 9CC34 & 10CC55 Deleted			72.48 Log No.: SE00106	
D3-HSM-27; 103/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity deleted rebar 9CC34 and 10CC55 on the cut sheets only (bill of materials). The deletion of the rebar occurred during the design review stage, thus the final detail drawings were accurate. This design change was made to make the rebar cut and bend lists consistent with the detail drawings. It was determined during the design review stage that this reinforcement was not required. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a bars 9CC34 and 10CC55 deletion design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The bars 9CC34 and 10CC55 deletion design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Bars 9CC34 & 10CC55 Deleted			72.48 Log No.: SE00106	
D3-HSM-27; 103/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC31 Bar Quantity Change				72.48 Log No.: SE00107
D3-HSM-28; 104/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: JA CRUNKLETON JA Crunkleton Jr
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ________ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ________ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ________ No X

Signature: JB Lemons Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: ________________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC31 Bar Quantity Change				72.48 Log No.: SE00107
D3-HSM-28; 104/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC31 Bar Quantity Change			72.48 Log No.: SE00107	
D3-HSM-28; 104/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 9CC31 bar quantity design change. The subject activity changed the quantity of rebar 9CC31 from 50 to 130, and changed the length from 15'-10" to 37'-0". This additional amount of reinforcing steel was offset by replacing large quantities of the same size but shorter reinforcing steel (see safety evaluations SE00108 and SE00109). The longer bars are easier to handle and place and therefore simplify construction. Due to the offset, this design change does not change the amount of rebar in the walls. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC31 Bar Quantity Change				72.48 Log No.: SE00107
D3-HSM-28; 104/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed the quantity of rebar 9CC31 from 50 to 130, and changed the length from 15'-10" to 37'-0". This additional amount of reinforcing steel was offset by replacing large quantities of the same size but shorter reinforcing steel (see safety evaluations SE00108 and SE00109). The longer bars are easier to handle and place and therefore simplify construction. Due to the offset, this design change does not change the amount of rebar in the walls. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 9CC31 bar quantity design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 9CC31 bar quantity design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC31 Bar Quantity Change				72.48 Log No.: SE00107
D3-HSM-28; 104/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC32 To 6CC32 Bar Size Change	**72.48 Log No.: SE00108**
D3-HSM-29; 105/129; ES199601368 Supplement 001 Revision 0000	**Page 1 of 5**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO	Involve an unreviewed safety question (USQ)?
NO	Involve a change in the Technical Specifications/License Conditions or Bases?
NO	Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO	Involve a Significant Increase in Occupational Dose?
NO	Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC32 To 6CC32 Bar Size Change			72.48 Log No.: SE00108	
D3-HSM-29; 105/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC32 To 6CC32 Bar Size Change				72.48 Log No.: SE00108
D3-HSM-29; 105/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 9CC32 to 6CC32 bar size design change. The subject activity changed reinforcing bar from 9CC32 to 6CC32 and the quantity was changed from 80 to 140. The length was changed from 17'-5" to 4'-7", and changed the type from 2 to 17. Dimension "A" was deleted, dimension "B" was changed from 15'-10" to 1'-6", changed dimension "C" to 1'-7" and added dimension "D" as 1'-6". The use of 9CC31 as described in safety evaluation SE00107 eliminated the need for the 9CC32. This net effect resulted in the addition of the 6CC32 reinforcing steel, which was used to provide better rebar distribution in the walls. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC32 To 6CC32 Bar Size Change			72.48 Log No.: SE00108	
D3-HSM-29; 105/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed reinforcing bar from 9CC32 to 6CC32 and the quantity was changed from 80 to 140. The length was changed from 17'-5" to 4'-7", and changed the type from 2 to 17. Dimension "A" was deleted, dimension "B" was changed from 15'-10" to 1'-6", changed dimension "C" to 1'-7" and added dimension "D" as 1'-6". The use of 9CC31 as described in safety evaluation SE00107 eliminated the need for the 9CC32. This net effect resulted in the addition of the 6CC32 reinforcing steel, which was used to provide better rebar distribution in the walls. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 9CC32 to 6CC32 bar size design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 9CC32 to 6CC32 bar size design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC32 To 6CC32 Bar Size Change				72.48 Log No.: SE00108
D3-HSM-29; 105/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC33 To 6CC33 Bar Size Change			72.48 Log No.: SE00109	
D3-HSM-30; 106/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] PRINTED NAME AND SIGNATURE Department: NED-CEU 42-01-04 Date: 11-7-97

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] POSRC CHAIRMAN Date 12-3-97

Approved ✓ Disapproved ______ Signature: [signature] PLANT GENERAL MANAGER Date 12-3-97

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] OSSRC SES CHAIRMAN Date: 1/30/98

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC33 To 6CC33 Bar Size Change			72.48 Log No.: SE00109	
D3-HSM-30; 106/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC33 To 6CC33 Bar Size Change				72.48 Log No.: SE00109
D3-HSM-30; 106/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 9CC33 to 6CC33 bar size design change. The subject activity changed reinforcing bar from 9CC33 to 6CC33 and the quantity was changed from 50 to 10. The length was changed from 28'-8" to 5'-4", and changed the type from straight to 17. Added dimension "B" as 1'-6", dimension "C" as 2'-4" and added dimension "D" as 1'-6". The use of 9CC31 as described in safety evaluation SE00107 eliminated the need for the 9CC33. This net effect resulted in the addition of the 6CC33 reinforcing steel, which was used to provide better rebar distribution in the walls. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC33 To 6CC33 Bar Size Change				72.48 Log No.: SE00109
D3-HSM-30; 106/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed reinforcing bar from 9CC33 to 6CC33 and the quantity was changed from 50 to 10. The length was changed from 28'-8" to 5'-4", and changed the type from straight to 17. Added dimension "B" as 1'-6", dimension "C" as 2'-4" and added dimension "D" as 1'-6". The use of 9CC31 as described in safety evaluation SE00107 eliminated the need for the 9CC33. This net effect resulted in the addition of the 6CC33 reinforcing steel, which was used to provide better rebar distribution in the walls. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 9CC33 to 6CC33 bar size design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 9CC33 to 6CC33 bar size design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 9CC33 To 6CC33 Bar Size Change			72.48 Log No.: SE00109	
D3-HSM-30; 106/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC37 Length Change				72.48 Log No.: SE00110
D3-HSM-31; 107/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature] for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC37 Length Change	72.48 Log No.: SE00110
D3-HSM-31; 107/129; ES199601368 Supplement 001 Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC37 Length Change				72.48 Log No.: SE00110
D3-HSM-31; 107/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC37 length design change. The subject activity shortened the length of reinforcing bar 10CC37 from 7'-10" to 7'-8", and shortened dimension "B" from 4'-0" to 3'-10". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC37 Length Change				72.48 Log No.: SE00110
D3-HSM-31; 107/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity shortened the length of reinforcing bar 10CC37 from 7'-10" to 7'-8", and shortened dimension "B" from 4'-0" to 3'-10". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC37 length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC37 length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC37 Length Change				72.48 Log No.: SE00110
D3-HSM-31; 107/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC38 Length Change				72.48 Log No.: SE00111
D3-HSM-32; 108/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC38 Length Change				72.48 Log No.: SE00111
D3-HSM-32; 108/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC38 Length Change	72.48 Log No.: SE00111
D3-HSM-32; 108/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC38 length design change. The subject activity shortened the length of reinforcing bar 10CC38 from 7'-7" to 7'-5", and shortened dimension "B" from 3'-9" to 3'-7". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC38 Length Change				72.48 Log No.: SE00111
D3-HSM-32; 108/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity shortened the length of reinforcing bar 10CC38 from 7'-7" to 7'-5", and shortened dimension "B" from 3'-9" to 3'-7". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC38 length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC38 length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC38 Length Change			72.48 Log No.: SE00111	
D3-HSM-32; 108/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC39 Length Change			**72.48 Log No.: SE00112**	
D3-HSM-33; 109/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 1 of 5**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC39 Length Change			72.48 Log No.: SE00112	
D3-HSM-33; 109/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC39 Length Change			72.48 Log No.: SE00112	
D3-HSM-33; 109/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

<u>Complete for 50.59 and 72.48:</u>

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Probability of Malfunction:</u>

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC39 length design change. The subject activity shortened the length of reinforcing bar 10CC39 from 7'-10" to 7'-8", and shortened dimension "B" from 4'-0" to 3'-10". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

<u>Consequences of Malfunction:</u>

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

<u>Probability of Accident:</u>

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

<u>Consequences of Accident:</u>

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC39 Length Change		72.48 Log No.: SE00112		
D3-HSM-33; 109/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity shortened the length of reinforcing bar 10CC39 from 7'-10" to 7'-8", and shortened dimension "B" from 4'-0" to 3'-10". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC39 length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC39 length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC39 Length Change				72.48 Log No.: SE00112
D3-HSM-33; 109/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC41 Length Change				72.48 Log No.: SE00113
D3-HSM-34; 110/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
Getachew Tesfaye 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON JA Crunkleton Jr.
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: JR Lemons Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC41 Length Change				72.48 Log No.: SE00113
D3-HSM-34; 110/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC41 Length Change				72.48 Log No.: SE00113
D3-HSM-34; 110/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC41 length design change. The subject activity shortened the length of reinforcing bar 10CC41 from 8'-8" to 8'-4", and shortened dimensions "B" and "D" from 3'-1" to 2'-11". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC41 Length Change				72.48 Log No.: SE00113
D3-HSM-34; 110/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity shortened the length of reinforcing bar 10CC41 from 8'-8" to 8'-4", and shortened dimensions "B" and "D" from 3'-1" to 2'-11". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC41 length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC41 length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC41 Length Change				72.48 Log No.: SE00113
D3-HSM-34; 110/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC42 Length Change				72.48 Log No.: SE00114
D3-HSM-35; 111/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature] Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: ______________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC42 Length Change				72.48 Log No.: SE00114
D3-HSM-35; 111/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC42 Length Change			72.48 Log No.: SE00114	
D3-HSM-35; 111/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC42 length design change. The subject activity shortened the length of reinforcing bar 10CC42 from 8'-1" to 7'-5", shortened dimensions "B" and "D" from 3'-1" to 2'-11", and shortened dimension "C" from 1'-11" to 1'-7". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC42 Length Change				72.48 Log No.: SE00114
D3-HSM-35; 111/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity shortened the length of reinforcing bar 10CC42 from 8'-1" to 7'-5", shortened dimensions "B" and "D" from 3'-1" to 2'-11", and shortened dimension "C" from 1'-11" to 1'-7". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC42 length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC42 length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC42 Length Change			72.48 Log No.: SE00114	
D3-HSM-35; 111/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC43 Length Change				72.48 Log No.: SE00115
D3-HSM-36; 112/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC43 Length Change	**72.48 Log No.: SE00115**
D3-HSM-36; 112/129; ES199601368 Supplement 001 Revision 0000	**Page 2 of 5**

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC43 Length Change			72.48 Log No.: SE00115	
D3-HSM-36; 112/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC43 length design change. The subject activity shortened the length of reinforcing bar 10CC43 from 7'-10" to 7'-5", shortened dimensions "B" and "D" from 3'-1" to 2'-11", and shortened dimension "C" from 1'-8" to 1'-7". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC43 Length Change			72.48 Log No.: SE00115	
D3-HSM-36; 112/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity shortened the length of reinforcing bar 10CC43 from 7'-10" to 7'-5", shortened dimensions "B" and "D" from 3'-1" to 2'-11", and shortened dimension "C" from 1'-8" to 1'-7". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC43 length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC43 length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC43 Length Change				72.48 Log No.: SE00115
D3-HSM-36; 112/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC44 Length Change				72.48 Log No.: SE00116
D3-HSM-37; 113/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11.7.97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC44 Length Change			72.48 Log No.: SE00116	
D3-HSM-37; 113/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC44 Length Change			72.48 Log No.: SE00116	
D3-HSM-37; 113/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC44 length design change. The subject activity shortened the length of reinforcing bar 10CC44 from 8'-1" to 7'-5", shortened dimensions "B" and "D" from 3'-1" to 2'-11", and shortened dimension "C" from 1'-11" to 1'-7". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC44 Length Change				72.48 Log No.: SE00116
D3-HSM-37; 113/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity shortened the length of reinforcing bar 10CC44 from 8'-1" to 7'-5", shortened dimensions "B" and "D" from 3'-1" to 2'-11", and shortened dimension "C" from 1'-11" to 1'-7". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC44 length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC44 length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC44 Length Change			72.48 Log No.: SE00116	
D3-HSM-37; 113/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC45 Length Change			**72.48 Log No.: SE00117**	
D3-HSM-38; 114/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 1 of 5**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved Approved Disapproved

Signature: J.A. CRUNKLETON [signature] Signature: Michael J. Gahan [signature]
INDEPENDENT REVIEWER for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11/12/97 Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12·3·97

Recommend Approval ✓ Recommend Disapproval ______ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: [signature] Date: 1/30/98
OSSRC/SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC45 Length Change				72.48 Log No.: SE00117
D3-HSM-38; 114/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC45 Length Change			72.48 Log No.: SE00117	
D3-HSM-38; 114/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC45 length design change. The subject activity shortened the length of reinforcing bar 10CC45 from 8'-8" to 8'-4", and shortened dimensions "B" and "D" from 3'-1" to 2'-11". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC45 Length Change			72.48 Log No.: SE00117	
D3-HSM-38; 114/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity shortened the length of reinforcing bar 10CC45 from 8'-8" to 8'-4", and shortened dimensions "B" and "D" from 3'-1" to 2'-11". The bar sizes were adjusted to clear contractor installed form supports which interfere with the bars as detailed. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC45 length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC45 length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC45 Length Change				72.48 Log No.: SE00117
D3-HSM-38; 114/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 45° Bend Length Change				72.48 Log No.: SE00118
D3-HSM-39; 115/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: Michael J. Gahan [signature]
for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III

Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____________

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 45° Bend Length Change				72.48 Log No.: SE00118
D3-HSM-39; 115/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

Reinforcing Steel (Rebar) - steel bars (deformed or smooth) placed in forms which interact with the wet concrete mix. The final solidified mass becomes reinforced concrete. Since concrete is conservatively assumed to be incapable of resisting tension, reinforcing steel is used. The rebar is also placed in areas of flexure and shear. Some of the rebar may be bent up, angled, or oriented to resist diagonal shear. Stirrups, which are U-shaped and pass underneath the bottom steel, are used to resist diagonal tension and shear. Rebar is also used for crack control, which is typically placed near the face of the concrete. Rebar is available in a number of sizes, as well as in the form of wire for spiral wrapping, and wire mesh for shrinkage and thermal expansion control. The minimum length of rebar needed to provide a sufficient bond to keep the rebar from being pulled or pushed through the concrete is called the development length. Bar splices are used when the bar lengths required exceed the lengths available and are typically located away from points of maximum tension. The reinforcement ratio is the percentage of steel in a beam or slab that resists the tensile and shear stresses in the concrete.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 45° Bend Length Change			72.48 Log No.: SE00118	
D3-HSM-39; 115/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the 10CC47 45° bend length design change. The subject activity shortened the length of reinforcing bar 10CC47 by 8". The bar length was shortened to simplify bar installation. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the reinforcement of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 45° Bend Length Change			72.48 Log No.: SE00118	
D3-HSM-39; 115/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity shortened the length of reinforcing bar 10CC47 by 8". The bar length was shortened to simplify bar installation. The revised bar provides code required embedment and development lengths. The design of reinforcement placement is typically flexible, in that field construction changes can usually be accommodated. The important element in reinforcement design is to ensure the steel reinforcement ratio is satisfied and all ACI requirements are met. In this case, the steel reinforcement ratio was satisfied and all ACI requirements were met. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a 10CC47 45° bend length design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The 10CC47 45° bend length design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC47 45° Bend Length Change				72.48 Log No.: SE00118
D3-HSM-39; 115/129;	ES199601368	Supplement 001	Revision 0000	Page 5 of 5

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) reinforcing bars.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Access Sleeve Nelson Studs	**72.48 Log No.: SE00119**
D3-HSM-41; 116/129; ES199601368 Supplement 001 Revision 0000	**Page 1 of 5**

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk [signature] Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
[signature] 11/12/97 SIGNATURE / DATE	[signature] 11/10/97 SIGNATURE / DATE	[signature] 11/11/97 SIGNATURE / DATE

Approved Disapproved

Signature: J.A. CRUNKLETON [signature]
INDEPENDENT REVIEWER

Date 11/12/97

Approved Disapproved

Signature: [signature]
for CS-DES, CS-TES, or PE-PDSU
MICHAEL J. GAHAN

Date 11-14-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ____ Signature: [signature] Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ____ Signature: [signature] Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ____ No X

Signature: [signature] Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ____

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Access Sleeve Nelson Studs			72.48 Log No.: SE00119	
D3-HSM-41; 116/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) access sleeve.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Access Sleeve Nelson Studs				72.48 Log No.: SE00119
D3-HSM-41; 116/129;	ES199601368	Supplement 001	Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the access sleeve design change. The subject activity deleted the requirement that the Nelson studs shown on the HSM access sleeve be attached after delivery of the sleeves. Nelson studs may be fixed to sleeve at the fabrication shop or construction site. The quality of work is typically better when fabrication can occur at the shop in a controlled environment. This change does not affect the completed HSM and therefore has no impact on the HSM design or analysis. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the access sleeve of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Access Sleeve Nelson Studs			72.48 Log No.: SE00119	
D3-HSM-41; 116/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. deleted the requirement that the Nelson studs shown on the HSM access sleeve be attached after delivery of the sleeves. Nelson studs may be fixed to sleeve at the fabrication shop or construction site. The quality of work is typically better when fabrication can occur at the shop in a controlled environment. This change does not affect the completed HSM and therefore has no impact on the HSM design or analysis. The subject activity Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a access sleeve design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The access sleeve design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Access Sleeve Nelson Studs			**72.48 Log No.: SE00119**	
D3-HSM-41; 116/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 5 of 5**

Summary: (For NRC Report, provide a brief overview)

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) access sleeve.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Activity Summary: After a thorough and intense review, it has been concluded that the ISFSI documentation reviewed:

- Does not constitute an Unreviewed Safety Question (USQ)
- Does not increase the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR
- Does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the SAR
- Does not reduce the margin of safety as defined in the basis for any ISFSI Technical Specification
- Does not result in a significant increase in occupational dose
- Does not constitute an Unreviewed Environmental Impact (UEI)

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Rail Lubricant Change				72.48 Log No.: SE00120
D3-HSM-42; 117/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5

Based on the attached discussion, does this activity:

Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations

NO Involve an unreviewed safety question (USQ)?
NO Involve a change in the Technical Specifications/License Conditions or Bases?
NO Require a change or addition to the UFSAR/USAR?

Applicable to 10 CFR 72.48 Safety Evaluations

NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?

Prepared by: J. E. Remeniuk ______ Department: NED-CEU 42-01-04 Date: 11-7-97
PRINTED NAME AND SIGNATURE

YES Is a special review required by groups other than the group to which the Preparer belongs?

Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. J. Dobry Work Group: PES	Resp. Indv.: R. H. Beall Work Group: NFM
11/12/97 SIGNATURE / DATE	11/10/97 SIGNATURE / DATE	11/11/97 SIGNATURE / DATE

Approved Disapproved
Signature: J.A. CRUNKLETON
INDEPENDENT REVIEWER
Date 11/12/97

Approved Disapproved
Signature: for GS-DES, GS-TES, or PE-PDSU
MICHAEL J. GAHAN III
Date 11-13-97

The POSRC has reviewed this evaluation according to NS-2-101.

POSRC Meeting No.: 97-137 Date: 12-3-97

Recommend Approval ✓ Recommend Disapproval ______ Signature: ______ Date 12-3-97
POSRC CHAIRMAN

Approved ✓ Disapproved ______ Signature: ______ Date 12-3-97
PLANT GENERAL MANAGER

The OSSRC has reviewed this evaluation according to NS-2-100.

Full OSSRC Committee review required? Yes ______ No X

Signature: ______ Date: 1/30/98
OSSRC SES CHAIRMAN

If yes, OSSRC Meeting No.: ______

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Rail Lubricant Change			72.48 Log No.: SE00120	
D3-HSM-42; 117/129;	ES199601368	Supplement 001	Revision 0000	Page 2 of 5

Proposed Activity: To evaluate an ISFSI design change that occurred prior to the issuance of the ISFSI license in November, 1992. This particular safety evaluation addresses a design change to the HSM (Horizontal Storage Module) rail lubricant.

Reason for Activity: This design change was fully evaluated and justified by Pacific Nuclear Fuel Services and approved by BGE for construction prior to the issuance of the ISFSI license in November, 1992. This design change was included in a document which was submitted to the NRC on July 16, 1992, which provided the first revision to the original SAR and provided changes made to ISFSI design documents during fabrication that had not been previously reviewed by the NRC. This safety evaluation was performed because the NRC has not reviewed that submittal.

Function(s) of affected SSC: NUHOMS-24P (Nutech Horizontal Modular System) is a dry storage system that provides safe, interim storage for irradiated fuel assemblies. The system was designed by Pacific Nuclear Fuel Services (PNFS) (formerly Nutech Engineers, Inc.), which has since become Vectra Technologies, Inc. There are four major components of the NUHOMS-24P system. The four components are 1) Dry Shielded Canister (DSC); 2) Transfer Cask (TC); 3) Lifting Yoke (Yoke); and 4) Horizontal Storage Module (HSM). A detailed description of each of these components is contained in the USAR and the NUHOMS-24P Topical Report. What follows is a brief description of the NUHOMS-24P system and those component(s) related to this evaluation.

NUHOMS-24P - the Calvert Cliffs license allows construction and operation of a total of 120 HSM's, which can house 2880 fuel assemblies. These modules can be built incrementally, as needed, to match BGE's requirements for additional storage. There are currently 48 HSM's constructed, which will allow for the continued generation and storage of spent fuel until approximately 2004. Each HSM contains one DSC, and each DSC contains 24 fuel assemblies. The fuel assemblies are transferred from the spent fuel pool via the DSC and the TC via the heavy haul road to the ISFSI site, where the DSC is then inserted into the HSM for interim storage.

Dry Shielded Canister (DSC) - the DSC is a Type 304 stainless steel cylinder with an internal stainless steel or aluminum coated carbon steel basket assembly that houses 24 fuel assemblies. The DSC is designed to fit securely in the TC and to slide into the HSM from the TC without undue galling. The function of the DSC is to provide physical and radiological protection, and structural support of the spent fuel during loading operations and storage in the HSM. The DSC has been designed for the worst-case postulated accidents, so that retrievability of the fuel from the DSC is assured even following a maximum credible accident.

Transfer Cask (TC) - the TC is a stainless steel cylinder with a bottom end closure assembly and a bolted top cover plate. There are two upper lifting trunnions near the top of the cask for downending / uprighting and lifting of the cask in the Auxiliary Building. The two lower trunnions serve as the axis of rotation during downending / uprighting operations and as supports during transport. The function of the TC is to provide radiological shielding during DSC closure operations and during transfer of the DSC to and from the ISFSI site. The TC is important to safety since it provides shielding and protection of the DSC from impact loads.

Horizontal Storage Module (HSM) - each HSM is a reinforced, concrete structure constructed in place at the ISFSI site. Calvert Cliffs employs a 2 x 6 array, a massive concrete structure which consists of twelve HSM's in two rows of six. The side walls and roof are three feet thick, whereas the front walls are three and one half feet thick. There are two foot thick interior walls which separate each HSM and provide neutron and gamma shielding and prevent scatter in adjacent modules during DSC loading. The function of the HSM is to safely provide interim storage of the DSC's. The HSM provides the necessary radiological protection to the public at all times. Each HSM has been designed for worst case postulated and hypothetical accidents, including scenarios such as design basis tornadoes and tornado missiles.

ISFSI USAR Revision No.: 5

ISFSI USAR Sections reviewed: The main chapters reviewed were 1, 3, 4, 5, 7, and 8. The key sections reviewed were 1.3, 3.3, 3.4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, and 8.2.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Rail Lubricant Change	72.48 Log No.: SE00120
D3-HSM-42; 117/129; ES199601368 Supplement 001 Revision 0000	Page 3 of 5

Complete for 50.59 and 72.48:

1. The probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the SAR is not increased.

NO May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Probability of Malfunction:

The probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as the result of this activity. The NUHOMS-24P system is a totally passive installation that is designed to provide shielding and safe confinement of irradiated fuel. The passive nature in itself provides a minimal probability for any malfunction to occur. There are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of the rail lubricant design change. The subject activity changed the rail lubricant from Everlube 823 to Permaslik RN. The lubricant change was made as an improvement to the HSM design. The Permaslik RN has superior tribological properties to the Everlube 823 while containing no molybdenum disulfide (which is not allowed in the fuel pool). Tribological properties refers to the friction, lubrication, and wear of interacting surfaces that are in relative motion. The change to eliminate a chemical not allowed in the spent fuel pool was necessary and is an improvement which does not adversely affect the HSM design or analysis. Since 1993, all fuel moves have resulted in a smooth transfer of the DSC from the TC into the HSM without any damage to the sliding surfaces. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety.

NO May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?

Consequences of Malfunction:

The consequences of a malfunction of equipment important to safety previously evaluated in the SAR will not be increased as a result of this proposed activity. As stated above, there are no possible malfunctions of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

NO May the probability of occurrence of an accident previously evaluated in the SAR be increased?

Probability of Accident:

The probability of occurrence of an accident previously evaluated in the SAR will not be increased as the result of the activity. None of the accident scenarios address the rails and lubricants of the HSM.

NO May the consequences of an accident previously evaluated in the SAR be increased?

Consequences of Accident:

The consequences of an accident previously evaluated in the SAR will not be increased as a result of this activity. As stated above, there are no possible accidents of the HSM which are described or evaluated in the USAR as a result of this proposed activity. As such, there are no consequences to consider.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Rail Lubricant Change				72.48 Log No.: SE00120
D3-HSM-42; 117/129;	ES199601368	Supplement 001	Revision 0000	Page 4 of 5

2. The possibility for an accident or malfunction of a different type than any evaluated previously in the SAR is not created.

NO May the possibility of a malfunction of a different type than any previously evaluated in the SAR be created?

Possibility of New Malfunction:

The possibility of a malfunction of a different type than any previously evaluated in the SAR will not be created as a result of this activity. The subject activity changed the rail lubricant from Everlube 823 to Permaslik RN. The lubricant change was made as an improvement to the HSM design. The Permaslik RN has superior tribological properties to the Everlube 823 while containing no molybdenum disulfide (which is not allowed in the fuel pool). Tribological properties refers to the friction, lubrication, and wear of interacting surfaces that are in relative motion. The change to eliminate a chemical not allowed in the spent fuel pool was necessary and is an improvement which does not adversely affect the HSM design or analysis. Since 1993, all fuel moves have resulted in a smooth transfer of the DSC from the TC into the HSM without any damage to the sliding surfaces. Based on this information, the subject design change will not affect the form, fit or function of the HSM, is not detrimental to the structural integrity of the HSM, and will not adversely affect the ability of the HSM to perform it's intended design function. Therefore, this design change has no detrimental impact on equipment important to safety, and will not create the possibility of a new malfunction not previously evaluated in the SAR.

NO May the possibility of an accident of a different type than any previously evaluated in the SAR be created?

Possibility of New Accident:

The possibility of an accident of a different type than any previously evaluated in the SAR will not be created as a result of this proposed activity. After a thorough and intense review, it was concluded that this activity would not create the possibility of a new accident not previously evaluated in the SAR.

Complete for 50.59 and 72.48:

3. The margin of safety as defined in the basis for any ISFSI Technical Specification is not reduced.

NO Will the margin of safety as defined in the basis for any ISFSI Technical Specification be reduced?

Bases Discussion of why the margin of safety is not reduced

None of the Technical Specifications nor the Bases are affected by this activity.

Complete for 72.48:

NO Will the proposed activity involve a significant increase in occupational dose?

A significant increase in occupational dose:

A significant increase in occupational dose will not occur as a result of this proposed activity. The activity provided a rail lubricant design change. BGE approved this design change for construction prior to the issuance of the ISFSI license in November, 1992. The rail lubricant design change does not adversely affect the operation or the associated occupational exposures as described in ISFSI USAR Table 7.4-1.

NO Will the proposed activity involve a significant unreviewed environmental impact?

A significant unreviewed environmental impact:

A significant unreviewed environmental impact will not occur as the result of this proposed activity. The proposed activity does not affect the environmental conditions of the ISFSI.

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Rail Lubricant Change				**72.48 Log No.: SE00120**
D3-HSM-42; 117/129;	**ES199601368**	**Supplement 001**	**Revision 0000**	**Page 5 of 5**

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