		Page 1 of 4	
ACTIVITY: Calvert Cliffs ISFSI USAR Cha	nge 50.59 Log No	or 72.48 Log No. 94-0-101-001	
Based on the attached discussion, does this a	activity:		
Applicable to 10 CFR 50.59 and 10 CFR 72	2.48 Safety Evaluations		
YES X NO Involve an Unreview	YES X NO Involve an Unreviewed Safety Question (USQ)?		
		/License Conditions or Bases?	
X YES NO Require a change or	addition to the UFSAR or U	JSAR?	
Applicable to 10 CFR 72.48 Safety Evaluations			
	t Increase in Occupational E t Unreviewed Environmenta		
Dam Shakir	Controllered Environmenta	i impact:	
Prepared by: SAM SHAKIR PRINTED NAME AND SIGNATURE (VECTRA)	Department: CCSo	Date: 8/31/94	
X YES NO Is a special review required by groups other than the group to which the Preparer			
Resp. Ind.: Resp. Ind.: Resp. Ind.	1.: JOHN B. MAKAR PRINTED NAME	Resp. Ind.: Patricia A. Jones	
11/19/10/11/00	7	(Da 00)	
SIGNATURE SSS FOR	SIGNATURE TOLD	SIGNATURE	
Work Work	1618601.	Work	
Group: Fuel Management Group: S	System Engineer_	Group: Radiation Safety_	
Date: \$\\\ 31/94 \text{Date:}	8/31/94	Date: 8/31/94	
Approved / Disapproved	Approved $\underline{\nu}$	Disapproved	
Signature Oss for M-Taylor Per Telecon Signature Muhally Halings (September 1) Signature Michael Signa			
Date 8/31/94	Date	ey, 8/31/94 Per Telecon.	
The POSRC has reviewed this evaluation accor			
POSRC Meeting No.: $94-139$ Date: $8-12-94$			
Recommend Recommend			
Approval Disapproval Signature Date: 9-/2-9-			
Approved Disapproved Signature Date: 9/12/94			
The OSSRC has reviewed this evaluation according to NS-2-100. OSSRC Meeting No.: 15.003 Date:			
Recommend Recommend			
Approval Disapproval Signature_	00000 00111	Date:	
<u> </u>	OSSRC CHAIRMAN		

WORK GROUP
Licensing Unit
Periewed By: Getachow Tosfaye

Reviewed By: Getachow Tosfayer 8-31-94

	Page 2 of 4		
ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No	or 72.48 Log No. <u>94-0-101-001</u>		
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:			
 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." 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 previously evaluated in the SAR be increased?	tion of equipment important to safety		
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.			

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

evaluated in the SAR be increased?

__Yes <u>X</u> No

May the consequences of a malfunction of equipment important to safety previously

		Page 3 of 4
ACTIVITY: Calvert Cl	iffs ISFSI USAR Change 50.59 Log No. or	72.48 Log No. 94-0-101-001
	consequences of a weld malfunction. The occupation of manual welding in place of the automatic remotel in the answer to question 3.	nal dose consequences for the use y operated welder are addressed
Yes _X_ No	May the probability of occurrence of an accident pre increased?	viously evaluated in the SAR be
	Two accident scenarios, a drop accident and a leakage ISFSI USAR that consider a breach in the containment formed by the canister closure welds. The probability by the proposed change since the integrity and qualify good as those made by the automatic welder. The magnalified welders will be placed in accordance with the P8-T-LH (manual), and must pass nondestructive teamethod (manual or automatic) is not relevant to the both welding methods are subject to the same quality	ent and confinement boundary y of these accident is not increased ty of the manual welds will be as anual welds performed by the requirements of WPS P8-T or sting. Therefore, the welding probability of an accident since
Yes <u>X</u> No	May the consequences of an accident previously eval	luated in the SAR be increased?
	The consequences of a drop accident causing failure the consequences of a DSC leakage accident due to a welding method.	in the canister closure welds, or weld leak are not affected by the
2. The possibility for an anot increased.	accident or malfunction of a different type than any ex	valuated previously in the SAR is
Yes <u>X</u> No	May the possibility of a malfunction of a different tylin the SAR be created?	pe than any previously evaluated
	No new malfunctions can be caused by the canister of closure welds are done in accordance with all applic procedures, and must pass the nondestructive testing	able codes, standards and
Yes <u>X</u> No	May the possibility of an accident of a different type the SAR be created?	than any previously evaluated in
	No new accidents can be caused by the canister closure welds are done in accordance with all appliprocedures, and must pass the nondestructive testing	cable codes, standards and
Complete for 50.59 and 72.48:		
3. The margin of safety a	as defined in the basis for any Technical Specification	is not reduced.
YesX No	Will the margin of safety as defined in the basis for a reduced?	any Technical Specification be

Page 4 of 4 ACTIVITY: Calvert Cliffs ISFSI USAR Change or 72.48 Log No. 94-0-101-001 50.59 Log No. 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 <u>X</u> 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 Applicabilityx_ 10 CFR 72.48 Applicability (Check one regulation only)		
CCNPP	xISFSI (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:	
xUFSAR/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)		
1YES <u>x</u> NO Is the pro	posed activity a change or will it cause a change to the Specifications/License Conditions or Bases?	
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.

21001100 / IIIIOIIaiiioiki i Topoo		
CCNPP/ISFSI Facility (10 CFR 50.59/72.48)		
1x_YESNO	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	n below:	
Why is the SAR desc	ription of the function of the SSC not affected?	
•		
Why is the SAR desc affected?	ription of the method of performing the function of the SSC not	
Why is the SAR desc	ription of the design of the SSC not changed?	
2YES <u>x</u> 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 activ	ity does not affect other SSCs described in the SAR	
closure welds during the clos accordance with the Welding nondestructively tested. The	e of manual welding, in addition to the automatic welding system, for sure operation of the DSC. The manual weld will be made in g Procedure Specification WPS P8-T or P8-T-LH (Manual) and must be quality and integrity of the manual weld is as good as the weld placed is activity will not affect other SSCs described in the ISFSI USAR.	
3x_YESNO	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.)	
4x_YESNO	Will the proposed activity add to or delete from the SAR description of a SSC?	

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 3

1. <u>x</u> YESNO	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.	
2YES <u>x</u> 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 be	low:	
to be made manually in additionance in accordance with the P8-T-LH (Manual). The man automatic welder. Therefore	rill change the appropriate ISFSI procedures to allow for closure welds tion to using the automatic welding system. The manual weld will be requirements of the Welding Procedure Specification WPS P8-T or roual weld shall be of the same characteristics as the weld placed by the e, manual welding shall not impact the design, function, or method of e DSC, the top cover plate, or shield plug.	
Tests or Experiments (10 CFR 50.59/72.48)		
1YES <u>x</u> 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 que	stions are only required to be answered for activities affecting ISFSI.	
1x_YESNO	Will the proposed activity increase any occupational dose for ISFSI related activities?	
2YES <u>x</u> NO	Will the proposed activity use additional property for ISFSI operations?	
3YESx_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: Jam Shakin sam SHAKIN Date: 8/30/94
PRINTED NAME AND SIGNATURE

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 1

This screening is for: 10 CFR 50.59 Applicability 10 CFR 72.48 Applicability (Check one regulation only)		
x_CCNPP	(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:	
xUFSAR/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)		
	ed activity a change or will it cause a change to the ecifications/License Conditions or Bases?	

(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.

Will the proposed activity cause Structures, Systems or Components

Justification:

2.____YES

__x__NO

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 answe License Amendment Propos	rs is "Yes," complete a Safety Evaluation and consult CCI-143 for sals.	
CCNPP/ISFSI Facility (10 C	FR 50.59/72.48)	
1YES <u>x</u> 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	on below:	
Why is the SAR desc	cription of the function of the SSC not affected?	
plate). All these components	n the function of the welded components (DSC, shield plug, and top s are part of the ISFSI and are described in the ISFSI USAR. No SSCs affected by this activity. Therefore, this activity does not affect the Auxiliary Building.	
Why is the SAR descaffected?	cription of the method of performing the function of the SSC not	
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 desc	cription of the design of the SSC not changed?	
the design of the DSC, which	the DSC closure operation is convenient and efficient. It does not affect h is an ISFSI component. No other SSCs in the Auxiliary Building, n takes place, are affected by this activity.	
2YES <u>x</u> 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 activ	rity does not affect other SSCs described in the SAR	
making welds during the clo accordance with the Weldin	e of manual welding, instead of the automatic welding system, for sure operation of the DSC. The manual weld will be made in g Procedure Specification WPS P8-T or P8-TLH (Manual) and must be manual weld will be as good as the weld made by the automatic affected by this activity.	
3YESx_NO	Is the proposed activity a revision to the SAR. (Editorial changes are limited to obvious grammatical/spelling errors, reorganization of	

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 3		
	portions of the SAR or minor changes that do not affect the intent of the information conveyed by a drawing.)	
4YESx_NO	Will the proposed activity add to or delete from the SAR description of a SSC?	
Procedures (10 CFR 50.59/	72.48)	
1YESx_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.	
2YESx_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 be	low:	
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)		
1YESx_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.		
1YESNO	Will the proposed activity increase any occupational dose for ISFSI related activities?	

Will the proposed activity use additional property for ISFSI

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

Justify each "No" answer below: Justification:

operations?

2.___YES NO

3.____YES ____NO

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 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 Date: 8/30/94
PRINTED NAME AND SIGNATURE

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

NONMOD #_94-29			
To: UFSAR CoordinatorError! Bookmark not defined. From: Sam Shakir Work Group CCSO Date 8/16/94 Printed Name Phone Number: 2179 System Number 101			
SECTION 1 (Change Initiation) UFSAR CHANGE SOURCE DOCUMENT			
FCR/FEC/MCR # Evaluation Log # 94-0-101-01			
RDC Procedure #			
License Amendment #			
Regulatory Generic Correspondence #			
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 MON # 94-29	
Printed Name and Signature RESP, IND. Printed Name and Signature	WORK GROUP: WORK GROUP: WORK GROUP:	
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: DAM SHAKIR DATE: 8/30/94		
RESP. ENGR'S. SUPERVISOR: Bes for M. TAYLOR Per Telecon DATE: 8 130/74		
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]

	<u>Operation</u>	Number of <u>Personnel</u>	Effective Time in Radiation Field (hours)	Distance	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 Pi	t					•
	Decontaminate Outer Surof Cask	face 2	1.00	1.5	83.6	83.6	167.2
	Decontaminate Shield Pland Exposed DSC Shell	ug 1	1.00	1.5	41.4	41.4	41.4
	Lower Water Level in DS Cavity	C 2	0.25	4.0	10.4	2.6	5.2
	Set up Automatic Welder to Weld Lead Plug to DS		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 Vacuum Dry DSC Cavity	and 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 wit Helium	h 2	0.25	4.0	75.3	18.8	37.7
	Perform Helium Leak Tes	t 1	0.50	1.5	130.6	65.3	65.3
~	Seal Weld Penetration P	lug 1	0.50	1.5	130.6	65.3	65.3
C	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 Weld Top Cover Plate To		0.25	1.5	66.7	16.7	33.4

CALVERT CLIFFS ISFSI UPDATED SAFETY ANALYSIS REPORT

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 <u>Transfer Trailer</u> [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 <u>Transfer Cask Skid and Positioning System</u>

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 <u>Hydraulic Ram System</u>

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 <u>Vacuum Drying System</u>

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 <u>Automated Closure Welding System</u>

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

		Page 1 of 4		
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 1	0 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?XYESNO Require a change or addition to the UFSAR or USAR?				
Applicable to 10 CFR 72.48 Safety E	evaluations			
YES X NO Involve a	Significant Increase in Occupational l Significant Unreviewed Environment			
Dam Shan	air CC-	Date: 8/2/94		
Prepared by: Sam SHAKIR PRINTED NAME AND SIGNATURE (Department: CCSo	Date: <u>8/2/14</u>		
X YES NO Is a special belongs?	d review required by groups other that			
Resp. Ind.: G. Tesfave.	Resp. Ind.: J.B. MAKAR	Resp. Ind.: Mobern H. Beall		
Work Group: Licensing	PRINTED NAME PRINTED NAME PRINTED NAME SIGNATURE WORK			
Date: 8/10/94	Date: 8-05 - 94	Date: 8/10/94		
Approved Disapproved Approved Disapproved				
Signature Dam Makir for Moses Taylor Signature Michael J. Hahande GS-DES OCTOBER OF TELE-CON. Date 8/4/94 Date Date				
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.: 94-145 Date: 9-25-87				
Recommend Recommend Approval Disapproval Signature Date 5-25-97				
Approved Disapproved Signature Date 9/20/84				
The OSSRC has reviewed this evaluation according to NS-2-100. OSSRC Meeting No.: Date: Date:				
Recommend Recommend				
Approval Disapproval Signature Date				

Page 2of 4

	-
ACTIVITY: Storage of En	or 72.48 Log. No. 94-0-101-002
new empty Dry Shielded C The DSCs are Stainless Sta DSCs and spent fuel are tr (HSMs) at the ISFSI site. I direction facing the HSMs normal spent fuel transpor USAR to allow the storage Add the following to Volum DSCs may be stored there stored horizontally on woo	effects of using the Independent Spent Fuel Storage Installation (ISFSI) site for storage of canisters (DSCs) horizontally on cribbing inside the security fence which surrounds that area cel cylindrical shells that when filled provide confinement of radioactive spent fuel. The ansferred from the Spent Fuel Pool and stored in the concrete Horizontal Storage Modules The orientation of the stored empty DSCs will be such that their ends are in the north-south. The empty DSCs will be stored at a distance away from the HSMs enough to allow for tation and storage activities. The activity will result in the following change to the ISFSI of these empty DSCs: me I, Section 4.1.1: "The ISFSI site may be utilized for storage of empty DSCs. The empty until they are needed for spent fuel loading and permanent storage. The empty DSCs will be d cribbing with their ends facing north-south at a distance from the HSMs to allow for tation and storage activities."
	ailable at Calvert Cliffs require storage until they can be used in the transfer and storage of provides a convenient and secure laydown storage area for these empty canisters until they
and flow paths for natural	C: buse spent fuel in DSCs and provide physical protection for the canisters, radiation shielding circulation heat dissipation. ISFSI SAR Vol. I, Sections 1.2.1, 4.1.1, 8.2.2.2 and 8.2.7.
	2.48: urrence or the consequences of an accident or malfunction of equipment important to safety n the SAR is not increased.
	May the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?
interaction betwee perform their phy stored empty cani criteria for storag	DSCs at the ISFSI site does not affect the function of the ISFSI or the HSMs. There is no en the stored empty canisters and the HSMs at the ISFSI. The ability of the modules to rical protection, heat removal and shielding function is not affected by the presence of the isters at the ISFSI site. In addition, storage of the DSCs will be in accordance with the plant of safety related components. Therefore, the probability of a malfunction of equipment by previously evaluated in the SAR is not increased.
YesX No	May the consequences of a malfunction of equipment important to safety previously evaluated in the SAR be increased?
No malfunctions proposed activity.	are associated with temporary storage of empty canisters at the ISFSI site as described in the
YesX 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

Page 3 of 4

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 the 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 that 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				

Page 4 of 4

ACTIVITY: 8	torage 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	3. The margin of safety as defined in the basis for any Technical Specification is not reduced.						
Yes <u>X</u> N	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	<u>48:</u>						
Yes <u>X</u> N	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_ N	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 Work Group Printed Name Phone Number: 2179 System Number 10	· · · · —			
SECTION 1 (Change Initiation) UFSAR CHANGE SOURCE DOCUM	ENT			
FCR/FEC/MCR #	Safety Evaluation Log # 94-0-101-02			
RDC Pro	cedure #			
License Amendment #				
Regulatory Generic Correspondence #	ic Letter, Bulletin or Information Notice			
Unit 1 Unit 2 Com	mon 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				

ATTACHMENT 2, UFSAR CHANGE REQUEST FORM (UCR)

SECTION 2 (Interdisciplinary Reviews)				
Printed Name and Signature RESP, IND. Printed Name and Signature	WORK GROUP:			
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: <u>Sam Shakir Sam SHAKIR</u> DATE: 3/4/94				
RESP. ENGR'S. SUPERVISOR: DATE: 8/4/94				
UFSAR COORDINATOR:	DATE:			
PE-LICENSING UNIT OR WGL:	DATE:			

CALVERT CLIFFS ISFSI UPDATED SAFETY ANALYSIS REPORT

4.0 <u>INSTALLATION DESIGN</u>

4.1 <u>SUMMARY DESCRIPTION</u>

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 ADI arrays as needed. Figure 4.1-2 shows the arrangement of the storage arrays

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 <u>Controlled Area</u> [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.

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ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 1

This screening is for:10 CFR 50.59 A	Applicability <u>x</u> 10 CFR 72.48 Applicability (Check one regulation only)			
CCNPP	xISFSI (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)				
	ed activity a change or will it cause a change to the ecifications/License Conditions or Bases?			
(SSCs) to be Specifications If both answers are "No," continue with the	sed activity cause Structures, Systems or Components operated in a manner that violates the Technical s/License Conditions or Bases? e screening. Justification for each "No" answer shall be I Specifications/License Conditions that were reviewed.			

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.

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ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 2					
CCNPP/ISFSI Facility (10 CFR 50.59/72.48)					
1YES <u>x</u> 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	on below:				
Why is the SAR des	cription of the function of the SSC not affected?				
spent fuel assemblies. DSC Storage of the empty DSCs	to provide mechanical confinement and containment for the stored s loaded with spent fuel are inserted in the HSMs at the ISFSI site. inside the fence at the ISFSI site occurs when the DSCs are not notion and, therefore, has no impact on their function.				
Why is the SAR des affected?	cription of the method of performing the function of the SSC not				
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.					
2YES <u>x</u> 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. <u>x</u> YESNO	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.)				

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ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 3					
4. <u>x</u> YESNO	Will the proposed activity add to or delete from the SAR description of a SSC?				
Procedures (10 CFR 50.59	/72.48)				
1YES <u>x</u> 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.				
2YES <u>x</u> 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 be	low:				
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)					
1YESx_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.					
1YESx_NO	Will the proposed activity increase any occupational dose for ISFSI related activities?				

Justify each "No" answer below:

x_NO

x_NO

operations?

2.____YES

3.____YES

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.

Will the proposed activity use additional property for ISFSI

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

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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.			
1YESx_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 Dam Shakor Date: 8/4/94 PRINTED NAME AND SIGNATURE			

Based on the attached discussion, does this activity: Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety Evaluations YESX_NO				Page 1 of 4	
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? 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. S. MAKAR PRINTED NAME Work Group: Signature Work Group: Signature Approved Disapproved Signature Approved Disapproved Signature Signature Signature Signature Signature Approved Disapproved Signature Signature Signature Approved Disapproved Signature Date: 9-19-9 Y Recommend Approved Disapproved Signature Signature Signature Signature Signature Date: 9-19-9 Y Approved Disapproved Signature Signature Date: 9-19-9 Y Approved Disapproved Signature Signature Signature Date: 9-19-9 Y Approved Disapproved Signature Signature Signature Date: 9-19-9 Y Approved Disapproved Signature Signature Date: 9-19-9 Y Approved Disapproved Signature Signature Date: 9-19-9 Y Approved Disapproved Signature Date: 9-19-9 Y	ACTIVITY: Calvert Cliffs ISFSI	JSAR Change 50.	59 Log No 01	72.48 Log No. 94-0-101-003	
TYES 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? **ZHILL **JAMALE** PRENTED 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 **WORK** Group: **J. B. MAKAR** PRINTED NAME **WORK** Group: **J. B. MAKAR** Work** Group: **J. B. MAKAR** PRINTED NAME **WORK** Group: **J. B. MAKAR** PRINTED NAME **WORK** Group: **J. B. MAKAR** **J. B. MAKAR** **J. B. MAKAR** **WORK** Group: **J. B. MAKAR** **J. B. MAKAR** **WORK** Group: **J. B. MAKAR** **J. J. J. J. J.	Based on the attached discussion,	does this activity:			
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Applicable to 10 CFR 72.48 Safety Evaluations YESXNO				License Conditions or Bases?	
Applicable to 10 CFR 72.48 Safety Evaluations YES_X_NO					
Prepared by: SAM SHAKIR Department: CSo Date: 8/2/94 Prepared by: SAM SHAKIR Department: CSo 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 Resp. Ind.: G. Tesfage PRINTED NAME Work Group: SIGNATURE Work Group: Licensing Unit Group: Date: Approved Disapproved Disapproved Disapproved Signature Date: Signature Signat	Applicable to 10 CFR 72.48 Safety E	valuations			
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Prepared by: SAM SHAKIR 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. G. MAKAR PRINTED NAME Resp. Ind.: G. Tesfaye PRINTED NAME Work Group: SIGNATURE Work Group: System Engineer Date: 9-20-94 Date: Approved Disapproved Signature Industrial Reviewer (VECTRA) Per Tele Con. Date: S/4/94 Recommend Approved Disapproved Recommend Approved Disapproved Signature Industrial Reviewer (VECTRA) Per Tele Con. Date: 9-1-94 Approved Disapproved Signature Industrial Recommend Approved Disapproved Recommend Approved Disapproved Signature Industrial Recommend Approved Disapproved Signature Date: 9-2-94 Approved Disapproved Date: 9-2-94 Approved Disapproved Date: 9-2-94 Approved Disapproved Date: 9-2-94		•	-	1	
Prepared by: SAM SHAKE 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. G. MAKAR PRINTED NAME Resp. Ind.: G. Tesfage PRINTED NAME Work Group: SIGNATURE Work Group: System Engineer Date: 9-20-94 Date: 9-20-94 Date: Signature Approved Disapproved Signature Signature More Group: Signature Approved Disapproved Disapproved Disapproved The POSRC has reviewed this evaluation according to NS-2-101. POSRC Meeting No.: 94-145 Date: 9-12-94 Approved Disapproved Signature Recommend Approved Disapproved Signature Date: 9-12-94 Approved Disapproved Signature Date: 9-12-94 Approved Disapproved Signature PLANT GENERAL MANAGER Date: 9-20-94 Date: 9-12-94		n		1 1	
X YES NO	Prepared by: SAM SHAKIR	Departr	nent: CCSo	Date: 8/2/94	
Resp. Ind.: J. B. MAKAR PRINTED NAME PRINTED NAME PRINTED NAME Work SIGNATURE Work Group: System Engineer Group: Licensing Unit Group: Date: Approved Disapproved Signature Signature Amproved Disapproved Signature Printed Name Printed Name Approved Disapproved Signature Makes Taylor Signature Makes Signature Printed Name Printed Name The POSRC has reviewed this evaluation according to NS-2-101. POSRC Meeting No.: 94-145 Date: 9-23-94 Approved Disapproved Signature Date: 9-23-94	PRINTED NAME AND SIGNATURE (VECTRA)		• •	
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Work Group: System Engineer Date: 8-5-94 Date: 9-20-94 Date: Approved Disapproved Disapproved Signature In Obsection Reviewer (Vector) Per Tele. Con. Date: 9-15-94 Recommend Recommend Approved Disapproved Signature Recommend Recommend Approved Disapproved Signature Signature 9-15-94 Recommend Recommend Approved Disapproved Signature Disapproved Disapproved Signature Plant General Manager Date: 9-25-94		Resp. Ind.: G.	Tesfaye NTED NAME		
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Per Tele. Con. Date: 8/4/94 Date:	Approved $ \underline{\hspace{0.5cm}} $ Disapp	roved	Approved <u>*</u>	Disapproved	
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Date: 8/4/94 Date: The POSRC has reviewed this evaluation according to NS-2-101. POSRC Meeting No.: 94-145 Date: 9-25-94 Recommend Recommend Approval Disapproval Signature Date: 9-25-94 Approved Disapproved Signature Date: 9/20/94		CTRA)	grace	TO SES US TSES, OF PEPPOSU M. J. GAHANOZ	
POSRC Meeting No.: 94-145 Date: 9-25-94 Recommend Approval Disapproval Signature Date: 9-23-94 Approved Disapproved Signature Date: 9/26/94					
Recommend Recommend Approval Disapproval Signature Signature Date: 9-23-97 Approved Disapproved Signature Date: 9/28/94	The POSRC has reviewed this evaluation according to NS-2-101.				
Approval Disapproval Signature Disapproved Signature Date: 9-23-9 7 Approved Disapproved Signature Date: 9/20/94	POSRC Meeting No.: 79-195 Date: 9-25-97				
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Approved Disapproved Signature Date: 9/28/94 PLANT GENERAL MANAGER	Approval Disapproval Signature The Son Date: 9-23-97				
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Recommend Recommend					
Approval Disapproval Signature Date:				Date:	

Page 2 of 4

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

Page 3 of 4

ACTIVITY: Calver	t 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 <u>X</u> No	May the probability of ocurrence of a malfunction of equipment important to safety previously evaluated in the SAR be increased?			
	of the canister and cask during transfer operations is not affected by the proposed changes since use the cask to exceed the design basis drop height of 80 inches. (Ref. BG&E Calc. C-91-75, C-3-25)			
YesX_ 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 <u>X</u> No	May the probability of occurrence of an accident previously evaluated in the SAR be increased?			
the physical di exceeding a he lowest point o with fuel in a	ty of a drop accident from above the 80 inches design basis drop height is not increased because imensions of the cask and trailer and associated transport equipment prevent the cask from eight of 80 inches if the maximum difference in elevation from the centerline of the road and in the shoulder is limited to 20 inches. Drop accidents for a Dry Shielded Canister (DSC) loaded transfer cask have been analyzed and can be sustained without unacceptable damage to the cask neights up to 80 inches above a thick hard surface.			
Yes <u>X</u> 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.				
YesX_ 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.

Page 4 of 4

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.		
YesX_ No Will the margin of safety as defined in the basis for any Technical Specification be reduced?		
 <u>Bases</u> Discussion of why the margin of safety is not reduced 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 A	Applicability <u>x</u> 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:
_xUFSAR/USAR:	UFSAR/USAR Change No.: 94-30
Other:	Identify Activity Type:
Brief description of the activity:	
unnecessarily restrictive regarding the allow transfer road surface and the relative width	of the transfer route and shoulders which is able elevation of the shoulder surface relative to the of the paved road and adjacent shoulders. The route is mbly between the Auxiliary Building and the ISFSI.
Technical Specifications/License Conditi	ons (10 CFR 50.59/72.48)
	ed activity a change or will it cause a change to the cifications/License Conditions or Bases?
(SSCs) to be o	sed activity cause Structures, Systems or Components operated in a manner that violates the Technical
If both answers are "No," continue with the	License Conditions or Bases? screening. Justification for each "No" answer shall be Specifications/License Conditions that were reviewed.
Changing the ISFSI USAR description of the specification.	e transfer road does not affect any technical
Technical Specifications/License Condition	Sections Reviewed:

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

Reviewed all sections of the ISFSI Technical Specification manual.

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 2

CCNPP/ISFSI Facility (10 CFR 50.59/72.48)				
1. <u>x</u>	_YES	^	10	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,"	' answei	r each (questio	n below:
	Why is	the SA	R desc	ription of the function of the SSC not affected?
•	Why is affected		AR desc	ription of the method of performing the function of the SSC not
	Why is	the SA	R desc	ription 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,	" answe	r the fo	llowing	question:
	Explair	why tl	he activ	ity does not affect other SSCs described in the SAR
Chang the ISI	ing the	ISFSI (JSAR d	escription of the transfer road does not affect other SSCs in the plant or
3. <u>x</u>	_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. <u>x</u>	_YES		_NO	Will the proposed activity add to or delete from the SAR description of a SSC?
Proce	dures (10 CFF	R 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.

Auxiliary Building and the ISFSI.				
Tests or Experiments (10 CFR 50.59/72.48)				
1YESx_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 bel	ow:			
Justification: This activity is	s not a test or experiment.			
ISFSI (10 CFR 72.48) These que	stions are only required to be answered for activities affecting ISFSI.			
1YESx_NO	Will the proposed activity increase any occupational dose for ISFSI related activities?			
2YESx_NO	Will the proposed activity use additional property for ISFSI operations?			
3x_YESNO	Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?			
Justify each "No" answer be	elow:			
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.			
1xYESNO	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:x10 CFR 50.59 A	Applicability 10 CFR 72.48 Applicability (Check one regulation only)	
<u>x</u> 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.: 94-30	
Other:	Identify Activity Type:	
Brief description of the activity:		
unnecessarily restrictive regarding the allow transfer road surface and the relative width	n of the transfer route and shoulders which is wable elevation of the shoulder surface relative to the of the paved road and adjacent shoulders. The route is embly between the Auxiliary Building and the ISFSI.	
Technical Specifications/License Conditions	tions (10 CFR 50.59/72.48)	
	ed activity a change or will it cause a change to the ecifications/License Conditions or Bases?	
(SSCs) to be	osed activity cause Structures, Systems or Components operated in a manner that violates the Technical s/License Conditions or Bases?	
If both answers are "No," continue with the	e screening. Justification for each "No" answer shall be I Specifications/License Conditions that were reviewed.	
Changing the ISFSI USAR description of th	ne 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)				
1YESx_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	on below:			
Why is the SAR desc	cription 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 dese	cription 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.				
2YES <u>x</u> _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.				
3YESxNO	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.)			
4YESxNO	Will the proposed activity add to or delete from the SAR description of a SSC?			

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORMPage 3

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

Proced	ures (1	0 C	FR 50.59/7	72.48)
1Y	/ES		<u>C</u> 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		<u>_</u> 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 e	each "N	lo" a	ınswer bel	ow:
from the 0-101-0	Auxilia 03). Ch	ary I nang	Building to jing the de	bes not affect any SSCs described in the UFSAR. The transfer of fuel the ISFSI is outlined in the ISFSI USAR (see 72.48 evaluation No. 94-scription of the road in the ISFSI USAR does not affect any procedures the fuel on the road.
Tests o	r Expe	rim	ents (10 C	FR 50.59/72.48)
1`	YES	>	<u>c</u> 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 e	each "N	lo" a	inswer bel	ow:
Justific	ation:	This	activity is	not a test or experiment.
ISFSI (1	0 CFR	72.	48) These ques	tions are only required to be answered for activities affecting ISFSI.
1Y	/ES		NO	Will the proposed activity increase any occupational dose for ISFSI related activities?
2Y	/ES		NO	Will the proposed activity use additional property for ISFSI operations?
3Y	/ES		NO	Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?
Justify e	each "N	lo" a	inswer bel	ow:
Justific	ation:			
SAR Se	ections	Rev	iewed:	
Volume	s I & IV	of t	he ISFSI U	JSAR

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 4

PRINTED NAME AND SIGNATURE				
Prepared By: 3AM SHAKIR Sour Shakir Date: 8/4/94				
If "Yes", Perform a separate Safety Evaluation Screening.				
10CFR 50.59 For Impact on CCNPP 10 CFR 72.48 For Impact on ISFSI				
1. x YESNO Does this activity require additional screening?				
4 VEO NO Boso Nito autistis continuo additional accessing				
If ANY answer is "Yes", A Safety Evaluation is required.				
· ·				

NONMOD #_94-30
To: UFSAR Coordinator From: SAM SHAKIR Work Group CC50 Date 8/03/94 PRINTED NAME Phone Number: 2179 System Number
SECTION 1 (Change Initiation) UFSAR CHANGE SOURCE DOCUMENT
Safety FCR/FEC/MCR # Safety Evaluation Log # 94-0-101-003 RDC Procedure #
License Amendment #
Regulatory Generic Correspondence #
Unit 1 Unit 2 Common !SFS! _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

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."

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

	94-30		
SECTION 2 (Interdisciplinary Reviews)			
Printed Name and Signature RESP. IND. Printed Name and Signature	WORK GROUP:		
RESP. INDPrinted Name and Signature	WORK GROUP:		
SECTION 3 (Implementation Verification VERIFICATION THAT PLANT MOD INFORMATION HAS BEEN IMPLEN	PIFICATION OR AS-BUILT		
☐ Partial Implementation			
(For changes which have been partic of the change on the marked-up UFS unit only, check the appropriate box	cally implemented, identify the completed portion SAR pages. If implementation is complete on one c, below.)		
🗀 Unit 1	□ Unit 2		
RESPONSIBLE ENGINEER:	DATE:		
SECTION 4 (Final Review/Approval Prior t	o UFSAR Incorporation)		
FINAL REVIEW & APPROVAL OF	THIS CHANGE:		
RESPONSIBLE ENGINEER: Dary			
RESP. ENGR'S. SUPERVISOR: <u>Jam Maki</u>	is for M. Taylor Per DATE: 8/04/94		
	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.)

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%. shoulders are either level with the road or slope up from the In those locations where the paved road abuts up to road. 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".

CALVERT CLIFFS ISFSI SAFETY ANALYSIS REPORT

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:

CHANGE

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.

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.

			Page 1 of 5
ACTIVITY: Calvert Cliffs ISFSI U	JSAR Change 50.	.59 Log No	or 72.48 Log No. 94-0-101-004
Based on the attached discussion,			
Applicable to 10 CFR 50.59 and 1	10 CFR 72.48 Safe	ety Evaluations	
	Unreviewed Safety		
	change to the Techn change or addition		License Conditions or Bases?
A 125 NO Require a	change of addition	to the Craak of C	SAR!
Applicable to 10 CFR 72.48 Safety F	Evaluations		
	Significant Increase		
YES _X_NO Involve a	Significant Unrevie	wed Environmental	Impact?
Prepared by: Sam Shakir Printed NAME AND SIGNATURE	<u>Oh kir</u> Der	partment: CCSO	Date: 1/13/94
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OSRC CHAIRMAN Date.			
Approved Disapproved Signature Date: 7/13/94			
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Page 2 of 5

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

Page 3 of 5 ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No. or 72.48 Log No. 94-0-101-004 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 <u>X</u> 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. May the consequences of an accident previously evaluated in the SAR be increased? Yes X No 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.

Page 4 of 5 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 055 7/13/14 not exceed one part per million for 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. ____Yes <u>X</u> 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? Discussion of why the margin of safety is not reduced Bases 1 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 \pm 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.

	Page 5 of 5
ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No.	or 72.48 Log No. <u>94-0-101-004</u>
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 livacuum drying it and backfilling it with helium does not 7.4-1 of Vol. I of the ISFSI USAR gives the estimated do removal and vacuum drying the DSC cavity (20.8 mrem will not be affected by the above changes.	affect the occupational dose. Table ose rates associated with water
Yes _X No Will the proposed activity involve a significant	unreviewed environmental impact?
The use of pressurized air in lieu of helium for liquid renadverse environmental impact nor does it affect the ISFS The Auxiliary Building processing systems are used duri operations. During this operation, the liquid and gases (a cavity are routed to the Auxiliary Building processing sy	I Environmental Impact Statement. ing the DSC purge and drying ir or helium) purged from the DSC
The ISFSI USAR (Vol. I, Sections 1.3.1.7, 1.3.1.9, 4.3.1, 5.1.1.3) descrit Drying System (VDS), which is used to remove water and air from the DS system is designed to operate in four modes: liquid removal by pumping, I pumping, and helium backfilling. This description is changed to allow pre helium in the second mode of liquid removal from the DSC cavity. After I air, the DSC will be vacuum dried to remove the air and vapors, and then be required inert environment for long term fuel clad integrity, as described in of helium to blowdown the water from the DSC cavity, limits the use of he results in less use of this gas, and eliminates the presence of it in the atmost in the atmosphere could interfere with the function of the closure weld leal helium leakage from the welds of the sealed DSC. The use of pressurized removal from the DSC cavity does not constitute an unreviewed safety que occupational exposure nor an unreviewed environmental impact for the Inclinstallation.	C and replaces it with helium. The helium forced liquid removal, vacuum essurized air to be used in lieu of liquid is forced out by the pressurized eackfilled with helium to provide the helium to the backfilling operation. This exphere of the Spent Fuel Area. Helium to detector that is designed to detect air instead of helium for liquid estion, a significant increase in

	NONMOD #_94-035			
To: UFSAR Coordinator From: Sam Shakir Work Group _ PRINTED NAME Phone Number: x2179 System Numb				
SECTION 1 (Change Initiation) UFSAR CHANGE SOURCE DOCUMENT				
• FCR/FEC/MCR # Pro Clincle One	ocedure #			
Regulatory Generic Correspondence #	neric Letter, Bulletin or information Natice			
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 performedstill 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.				

SECTION 2 (Interdisciplinary Reviews)	
RESP. IND. Printed Name and Signature RESP. IND. Printed Name and Signature RESP. IND. Printed Name and Signature	_ WORK GROUP: _ WORK GROUP: _ WORK GROUP:
SECTION 3 (Implementation Verification VERIFICATION THAT PLANT MODING INFORMATION HAS BEEN IMPLEI	DIFICATION OR AS-BUILT
Partial Implementation	
(For changes which have been part of the change on the marked-up UF unit only, check the appropriate bo	tially implemented, identify the completed portion FSAR pages. If implementation is complete on one ox, 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: Ton K. W. adfreta	Jon 91 Woodfield DATE: 7/8/94
RESP. ENGR'S. SUPERVISOR: MICHAEL J.	Hater DATE: 7.8.94
V	. САНДО , Ш . DATE;
	DATE:
4	

CALVERT CLIFFS ISFSI UPDATED SAFETY ANALYSIS REPORT

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 <u>Transfer Trailer</u> [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 <u>Hydraulic Ram System</u>

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 <u>Vacuum Drying System</u>

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 <u>Automated Closure Welding System</u>

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.

CALVERT CLIFFS ISFSI UPDATED SAFETY ANALYSIS REPORT

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. <u>Transfer Cask Preparation</u> Cask preparation includes exterior washdown and interior decontamination if necessary.
- B. <u>DSC Preparation</u> The canisters are thoroughly cleaned.
- C. <u>DSC/Transfer Cask Loading</u> 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. <u>DSC Fuel Loading</u> 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. <u>DSC Shield Plug Placement</u> 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. <u>Transfer Cask Lifting Out of the Pool</u> 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. <u>Transfer Cask/DSC Drying</u> -Helium lines are connected to the DSC vent port and the water inside the canister is forced out the siphon tube by pressurized 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. <u>Helium Filling</u> In order to ensure that no fuel and/or cladding oxidation occurs during storage, the DSC is filled with helium after evacuation.

4.3 <u>AUXILIARY SYSTEMS</u>

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 and 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 <u>Cask/DSC Drying Process</u> [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.

weldment and remove the automatic welding machine.

The Compressed helium supply of a compressed or source through 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

5.1-2 Rev. 1



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 NUHOMS² 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:

- I. 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.



Mr. Robert H. Beall Baltimore Gas & Electric Company

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July 11, 1994 BGE01-94-1028

If you have any additional questions, please contact me. Sincerely,

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

P. A. File

J. B. Makar

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 1

This screening is for:	10 CFR 50.59	Applicability <u>x</u> 10 CFR 72.48 Applicability (Check one regulation only)
	CCNPP	x_ISFSI (Check one facility only)
(Check one activity type onl	y)	Procedure No./Change No.:
Temporary Alterat	ion:	Temporary Alteration No.:
Setpoint Change:		SCAF No(s):
Modification:		MCR/FCR/FEC No.:FEC Supplement No.:
Core Reload:		Unit and Cycle:
_xUFSAR/USAR:		UFSAR/USAR Change No.: 94-035
Other:		Identify Activity Type:
pressurized air or helium for Vacuum Drying System (VI modes: liquid removal by properties backfilling. The change on pressurized air or helium is using air instead of helium liquid from the DSC, and to Spent Fuel Pool area which measuring leakage from the could result in a delay of the Auxiliary Building ventil	/ol. I, Sections or liquid removal DS). The curre umping, heliumly affects the seallowed for form is to save a sign eliminate the period could interfer e DSC inner coep DSC closure ation system.	1.3.1.7, 1.3.1.9, 4.3.1, and 5.1.1.3 to allow the use of all from the ISFSI Dry Shielded Canister (DSC) by the nt ISFSI USAR describes the VDS operation in four a forced liquid removal, vacuum pumping, and helium econd mode of the VDS operation, where the use of ced liquid removal from the DSC cavity. The benefits of nificant amount of helium needed for the blowdown of presence of helium concentration in the atmosphere of the with the function of the helium leak detector used for over plate closure weld. The presence of helium in the air operations until the helium concentration is removed by
Technical Specifications/	License Cond	itions (10 CFR 50.59/72.48)
1YESx_NO	Is the propos Technical Sp	sed activity a change or will it cause a change to the pecifications/License Conditions or Bases?
2YES <u>x</u> NO	(SSCs) to be	oosed activity cause Structures, Systems or Components of operated in a manner that violates the Technical of Discussions/License Conditions or Bases?
If both answers are "No," or provided. List the sections	continue with th	e screening. Justification for each "No" answer shall be al 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)

1YES	<u>x_</u> 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.

Safety Evaluation Screenings and Safety Evaluations

Salety Evaluation Scientings and Salety Evaluations nevision i				
ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 3				
2YES <u>x</u> NO	Will the proposed activity result in a chang the design, function or method of performi other SSC described in the SAR?			
If "No," answer the following	question:			
Explain why the activ	ity does not affect other SSCs described in	the SAR		
	by this activity. The final sealed inert environs the transition of the transition o			
3x_YESNO	Is the proposed activity a revision to the S limited to obvious grammatical/spelling en portions of the SAR or minor changes tha the information conveyed by a drawing.)	rors, reorganization of		
4. <u>x</u> YESNO	Will the proposed activity add to or delete a SSC?	from the SAR description of		
Procedures (10 CFR 50.59/	72.48)			
1YESx_NO	Will the proposed activity affect the intent in the SAR (editorial changes do not need			

Justify each "No" answer below:

<u>__x__</u>NO

__YES

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.

reviews, tests and safety review meetings.

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,

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?

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.				
1YESx_NO	Will the proposed activity increase any occupational dose for ISFSI related activities?			
2YES <u>x</u> NO	Will the proposed activity use additional property for ISFSI operations?			
3YESx_NO	Will the proposed activity add or change the roads or transport equipment, including cranes, used for ISFSI operations?			
Justify each "No" answer bel	ow:			
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.				
1x_YESNO	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: <u>x</u> 10 CFR 50.59 A	applicability 10 CFR 72.48 Applicability (Check one regulation only)
<u>x</u> 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:
xUFSAR/USAR:	UFSAR/USAR Change No.: 94-035
Other:	Identify Activity Type:
pressurized air or helium for liquid removal Vacuum Drying System (VDS). The currer modes: liquid removal by pumping, helium backfilling. The change only affects the serpressurized air or helium is allowed for forcusing air instead of helium is to save a sign liquid from the DSC, and to eliminate the prespent Fuel Pool area which could interfere measuring leakage from the DSC inner concould result in a delay of the DSC closure of the Auxiliary Building ventilation system. Of this screen is required since the activity take is a 10CFR 50.59 territory. No other SSCs	.3.1.7, 1.3.1.9, 4.3.1, and 5.1.1.3 to allow the use of from the ISFSI Dry Shielded Canister (DSC) by the at ISFSI USAR describes the VDS operation in four forced liquid removal, vacuum pumping, and helium cond mode of the VDS operation, where the use of sed liquid removal from the DSC cavity. The benefits of difficant amount of helium needed for the blowdown of resence of helium concentration in the atmosphere of the with the function of the helium leak detector used for over plate closure weld. The presence of helium in the air operations until the helium concentration is removed by only ISFSI SSCs are affected by this change, however, see place on the 69' level of the Auxiliary Building which inside the Auxiliary Building are affected by this change.
Technical Specifications/License Condi	tions (10 CFR 50.59/72.48)
	ed activity a change or will it cause a change to the ecifications/License Conditions or Bases?
(SSCs) to be	osed activity cause Structures, Systems or Components operated in a manner that violates the Technical s/License Conditions or Bases?
If both answers are "No," continue with the	e screening. Justification for each "No" answer shall be I 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
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1YES <u>x</u> 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?
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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		
3YESx_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.)	
4YESx_NO	Will the proposed activity add to or delete from the SAR description of a SSC?	
Procedures (10 CFR 50.59/	72.48)	
1YESx_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.	
2YES <u>x</u> 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 bel-	ow:	
from the DSC cavity during the place inside the Auxiliary built	llows the use of pressurized air in place of helium for liquid removal ne drying operation of the DSC. This is an ISFSI activity that takes ding. This change does not affect any procedures outlined in the ne design, function, or method of performing the function of any SSCs	
Tests or Experiments (10 C	FR 50.59/72.48)	
1YES <u>x</u> 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 bel	ow:	
Justification: This activity is	not a test or experiment.	
ISFSI (10 CFR 72.48) These ques	stions are only required to be answered for activities affecting ISFSI.	
1YESNO	Will the proposed activity increase any occupational dose for ISFSI related activities?	
2YESNO	Will the proposed activity use additional property for ISFSI	

Will the proposed activity use additional property for ISFSI operations?

ATTACHMENT 2, SAFETY EVALUATION SCREENING FORM Page 4

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	fill the proposed activity add or change the roads or transport quipment, 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 Safe	ety Evaluation is not required.
If ANY answer is "Yes", A Safet	ty Evaluation is required.
1x_YESNO D	oes 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 Sa	fety Evaluation Screening.
Prepared By: Sam Shakir	Dan Makir Date: 7/8/94
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? Involve a Significant Unreviewed Environmental Impact? YES X NO Department: PDSU Date: 11/30/94 Prepared by: Kirk A. Kondos 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 Work Work Group:_____ Group:_____ Group:_____ Date: Approved Disapproved _ Approved 📐 Disapproved Signature____ Signature INDEPENDENT REVIEWER : 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 Recommend Approval Disapproval Signature POSRC CHAIRMAN
Approved Disapproved Signature PLANT GENERAL MANAGER
The OSSRC has reviewed this evaluation according to NS-2-100. OSSRC Meeting No.: 96-005 Date: 5/16/96
Recommend Recommend
ApprovalDisapprovalSignatureDateOSSRC 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:

	ability of occurrence or the consequences of an accident or malfunction of at 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 Ma	alfunction:
The postulated mali	function is a malfunction of the backup meteorological system.
backup methods (for Calvert Cliffs Emerwind speed and directing sigma theta instrumoutside observation Guide 1.23. Since meteorological instruments of the control of the c	REG 0654 and Reg. Guide 1.23 allows independent systems OR procedures to be established as a obtaining measurements of wind direction, wind speed and an estimate of atmospheric stability). The gency Response Plan Implementation Procedures have established a backup method for obtaining ection from Patuxent River Naval Air Station. Backup atmospheric stability estimates are derived from tents (on the primary meteorological tower), and a method for determining atmospheric stability from if measurements are unavailable. These procedures meet the requirements of NUREG 0654 and Reg. these independent methods are adequate to provide required backup, deletion of the backup ruments located on the microwave tower does not increase the probability of malfunction of equipment 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 the SAR are not increased.
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)

ATTACHMENT 5, SAFETT BYADORION FORM (Fage 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: ISFS: USAR CHANGE 50.59 Log N	o.: <u>NA</u>	72.48 Log No.: <u>95-000</u>		
Based on the attached discussion, does this activity:			\supset	
Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety	Evaluations		_	
— YES X NO Involve an unreviewed	safety question (USC	2))?		
YES X NO Involve a change in the	Technical Specificat	ions/License Conditions or Bases	?	
X YESNO Require a change or add	ition to the UFSAR	/USAR?		
Applicable to 10 CFR 72.48 Safety Evaluations				
YES X NO Involve a Significant Inc	rease in Occupation	al Dose?	i	
YES X NO Involve a Significant Un	reviewed Environme	ental Impact?		
Prepared by malan M. A. CARR I	Department: NE	1/665/CEU Date: 6/30/	195	
PRINTED NAME AND SIGNATURE For N. Wood Sield Spr 1	Noodfield	7/5/95		
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belongs?	24			
Resp. Ind.: Resp. Ind.:	.H. USeall	Resp. Ind.: G. Tesfay	10	
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1 1 1 1	0/95	_	_	
	0/95	Date: 7-5-95	-	
Approved	Approved	Disapproved	"	
Signature System G.V. PATEL	- Signature Miss	Sall Holas		
INDEPENDENT REVIEWER 7-15-95		GS-TSES, or PE-PDSU		
Date 7-15-1935	Date 8	.17.95		
The POSRC has reviewed this evaluation according to				
POSRC Meeting No.: 95-97 Date: <u>F-23-95</u>				
Recommend Recommend				
Approval Disapproval Signature Call Date f-23-87				
POSRCETAIRMAN				
Approved Disapproved Signature	11 11 11	Do. 8/24/	195	
	PLANT GENERAL	MANAGER Date/27/	_	
The OSSRC has reviewed this evaluation according to	o NS-2-100.			
OSSRC Meeting No.: 95-60 Date: 11-20-45				
Recommend Recommend				
ApprovalDisapproval Signature		Date		
-	OSSRC CHAIRMA			

ATTACHMENT 3, SAFETY EVALUATION FORM (Page 2 of 4)

SE 60001

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 $\sqrt{\ }$ 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 $\sqrt{\ }$ 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 __\sum_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).

Complete for a 72.48:

Yes <u>\(\frac{1}{2}\)</u> 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 _\sum_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.

Summary: (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: MATTHEN A. CARR Printed Name	Work Group <u>C</u>	EU 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	Procedure #	ES 1995 0 1089-000		
License Amendment #	,			
Regulatory Generic Correspondence # Generic Letter, Bulletin	n or Information Notice			
Unit 1 Unit 2	Common	ISFSI X		
B. SAFETY EVALUATION [Cha	ck Onej			
Safety Evaluation Screening N BASIS FOR TYPE 1 UF		· · · · · · · · · · · · · · · · · · ·		
(Attach additional pages, if required)	SAR CHANGE CLASSI	FICATION		
Is the proposed UFSAR ch Specifications/License Co	-			
(If the above question is a				
Amendment Proposals.)Safety Evaluation Screening	attached Commence			
X Safety Evaluation Screening		(72.48)		
NRC Safety Evaluation Repo				
C. DESCRIPTION OF UFSAR CHANGE: INSERT A STATEMENT				
SPECIFICALLY RECOGNIZING THAT THE VEHICLE BARRIER				
TO BE INSTALLED ACROSS THE ISFS! HAVE ROAD DOES NOT REPRESENT A PUNCTURE THREAT TO THE TRANSFER				
CASK IN THE UNLIKELY EVENT OF A CASK DROP ACCIDENT				
DURING FUEL TRANSFER				
D. UFSAR SECTIONS AFFECT	TED: (Attach Marked up	p Page(s)]		
VOL I, SECTION 10.3.4.1, ITEM B. SPECIFICATIONS. (AND Q+A SECTION)				
(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. C. Testage Metagle Work GROUP: Licensing 7/5/95			
Printed Name and Signature			
RESP. IND. MINGST DON BUT WORK GROUP: 155 7/6/8			
RESP. IND. R.H. Beall / MA 2/Bull 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: Malan M.A. CARROATE: 8/10/95			
RESP. ENGR'S. SUPERVISOR MY Haharam 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:			

CALVERT CLIFFS ISFSI SAFETY ANALYSIS REPORT

LIMITING AND OPERATING CONDITIONS FOR TRANSFER CASK CONTAINING LOADED 10.3.4 DSC

Transfer Route Selection [See Reference 10.2] 10.3.4.1

Title: Α.

Transfer Route Selection

В.

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.

> 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.

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

Surveillance: F.

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).

		-,,	Page 1 of 4	
ACTIVITY: Calvert Cliffs ISFS	USAR Change 50	.59 Log No	r 72.48 Log No94-0-101-003	
Based on the attached discussion, does this activity:				
Applicable to 10 CFR 50,59 and	10 CFR 72.48 Sat	fety Evaluations		
YES X_NO Involve	n Timesrianud Cafe	··· O	·	
	n Unreviewed Safe	y Question (USQ)?	License Conditions or Bases?	
	a change or addition	to the UESAR or U	ISAP?	
			orac;	
Applicable to 10 CFR 72.48 Safety	Evaluations			
YES X NO Involve a	Significant Increase	e in Occupational D	lose?	
YES X NO Involve a	Significant Unreview			
Dave Shak				
Prepared by: SAM SHAKIR PRINTED NAME AND SIGNATURE	Depart	ment: CCSo	Date: 8/2/94	
THE PARTY STORY	(VECIKA)			
XYES NO Is a speci belongs?	al review required b	y groups other than	the group to which the Preparer	
Resp. Ind.: J.B. MAKAR	Resp. Ind.: G.	Testane	Resp. Ind.:	
PRINTED NAME K4042	PRI	NTED NAME	PRINTED NAME	
0,05/10	Vistaglas	2. A alta		
SIGNATURE	SIGNATURE	20 Alaries	SIGNATURE	
Work/	Work	- 11 11	Work	
Group: System Engineer	Group: Licen	sma Unit	Group:	
Date: 8-5-94	Date: 9-20	-94	Date:	
Approved V Disapp	proved	Approved _	Disapproved	
Simple A. A. h.		ana '	0 10 410 -	
Signature Sam Shakis for Independent Reviewer (v. Per Tele. Con.	HOSES 1 AY 101	Signature Mu	S.DES CE. TOPE - DEL POCE LA COM	
		1 gra	SUBSIGS-TSES, OF PEPDSUM, J. GAHANEZ	
Date: 8/4/94 Date:				
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.: 94-145 Date: 9-Ls-94				
Recommend Recommend				
ApprovalS	Signature Signature	Do San	20ate: 9-21-97	
Approved Disapproved Signature Ullive Date: 9/28/94				
The OSSRC has reviewed this evalu	ation according to N	IS-2-100.		
OSSRC Meeting No.:		Date:		
Recommend Recommend				
	signature		Data	
	OSSRC CHAIRMAN		Date:	

Page 2 of 4

ACTIVITY: Calvert Cliffs ISFSI USAR Change 50.59 Log No.

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 U (ES199501089-000)	Ipgrade Modification		
Purpose of Presentation: Recommendation for Approval	Information		
Close OI	Extend OI		
Activity Summary: (See POSRC/PRC Presenter's Guide III.A.1): ES199501 site's vehicle barrier systems to prevent access by a bomb carrying malevolen distance of selected SSCs. All of the new barriers will be outside the Protecte will cross the ISFSI haul road, adjacent to the NSF Sallyport. The ISFSI hau of items which may be installed within the 28 foot wide transfer route. No it mechanism to the spent fuel transfer cask (TC) may be installed in this zone, the required dimensions for the barrier not to pose a puncture risk to the TC explicitly provides for the proposed vehicle barrier to be present within the IS In addition, spent fuel moves are scheduled throughout the construction period to ensure the limitations of the ISFSI USAR are not violathe construction period.	t vehicle within the safe standoff ed Area and are NSR. One barrier all road has restrictions on the types tems which represent a puncture BGE Calculation C-95-0185 shows The proposed ISFSI USAR change SFSI haul road's 28 foot width.		
Safety Issues Involved: (See POSRC/PRC Presenter's Guide II.B. C. D. E. accident is the drop of the TC while moving spent nuclear fuel. BGE Calcula imposed by the proposed barrier components are enveloped by the existing T	tion C-95-0185 shows that the loads		
Recommendations to POSRC or PRC: (See POSRC/PRC Presenter's Guid Recommend approval of the Safety Evaluation and USAR change, with the (to NFM) Spent fuel transfers to or from the ISFSI will be prohibited from the haul road vehicle barrier adds any above-ground component until construction foot wide transfer route is essentially complete. (to Project Management) Work progress will be coordinated by the Project verseleduled fuel moves.	following precautionary actions: he time the construction of the ISFSI on of the components within the 28		
(to Project Management) Excavations within the 28 foot transfer route may period of any fuel moves; and, no tools or equipment which could represent present within the 28 foot transfer route during spent fuel moves.			

SAFETY EVALUATION FORM (Attachment 3)

	Page 1 of 4		
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 Cond	itions or Bases?		
	ations of Eugosi		
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 Malary Department: NED/DES/CEU	Date: 2/1/64		
(Printed Name and Signature)	~//B[/ P		
Yes No Is a special review required by groups other than the group to which the Pro	eparer belongs?		
(Printed Name and Signature)			
Responsible Indiv: C. G. Sarau Work Group: Facilities Svcs	Date: 2/20/96		
Responsible Indiv: E. M. Tyler Work Group: Licensing	Date: F-4/6,96		
Dames - 1.1. T - 1'	Date:		
Independ reviewer: K.C. ANSTEE K.C. Date Approved disapproved	Date: 2/21/96		
GS-DFS/GS-TSFS/PF- MICHAEL J. GAHAN MI MALL	Date: 2/21/96		
The POSRC has reviewed this evaluation to NS-2-101. POSRC Meeting No.: 96-17 Date: Z-			
Recommend: Approval Disapproval POSRC Chairman	Date: 222-18		
Plant General Manager	Date:2/16/51		
The OSSRC has reviewed this evaluation to NS-2-100. OSSRC Meeting No.: SES Date: 7-1-96			
Recommend: Approval Disapproval OSSRC Chairman	Date: 7-2-96		

EN-1-102 Rev 2 SFTYEVAL FORM MEETS INTENT OF PEV 3 malan 2/16/96

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

e 1,7

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:				
 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.				
 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.			
	May the possibility of an accident of a different type than any previously evaluated in he SAR be created?		
Possibility of a New Acciden	t: See the answer, above.		
COMPLETE FOR 50,59 AN	ID 72.48:		
3. The margin of safe	ty as defined in the basis for any Technical Specification is not reduced.		
	May the possibility of a malfunction of a different type than any previously evaluated in he 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 Tech Spec is to preclude an accident involving fire or explosion near the TC due to a larger amount of fossil fuels. The preclusion of tanker trucks within 100 meters ensures there we no tanker truck at the TF during spent fuel moves to the ISFSI.			
	•		
	roposed activity involve a significant increase in occupational dose?		
	supational dose: Relocating the TF did not change the spent fuel transfer route, elays in spent fuel transfer operations which would increase occupational dose due to		
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.			

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 PRINTED NAME AND SIGNATURE Department: NED-CEU 42-01-04 Date: 8-36-9
DE Reviewer: J. N. Woodfield Jan 91. April Department: NED-CEU 42-01-04 Date: 8/30/9
YES Is a special review required by groups other than the group to which the Preparer belongs?
Resp. Ind.: G. Tesfaye Resp. Indv.: C. L. Dobry Resp. Indv.: R. H. Beall
Work Group: Licensing Work Group: PES Work Group: NFM
SIGNATURE / DATE SIGNATURE WATE SIGNATURE / DATE
Approved Disapproved Disapproved
Signature: M. A. CARR Signature Mile J. D. J. R. C. C. Signature
Date 8/30/96 Date 8:30.96
Date 0 30.78
The POSRC has reviewed this evaluation according to NS-2-101. POSRC Meeting No.: 96-//0 Date: 8-30-96
Recommend Recommend Approval Disapproval Signature:
POSPE CITATION Date 3-30-7
Approved Disapproved Signature: Date Date Date
The OSSRC has reviewed this evaluation according to NS-2-100.
OSSRC Meeting No.: .: 97-0/ Date: 1/16/97
Recommend / Recommend
Approval Disapproval Signature: Date:
OSSRC CHAIRMAN

Independent Spent Fuel Storage Installation Safety Evaluation 72.48 Log No: SE00003
ES199601368 Supplement 000 Revision 0000 Page 2 of 5

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.

Independent Spent Fuel Storage Installation Safety Evaluation 72.48 Log No: SE00003
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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.

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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 proposed activity. The addition of the Nitronic hard sliding rails, which are ½" 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.

Independent Spent Fuel Storage Installation Safety Evaluation 72.48 Log No: SE00003
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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)

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ACTIVITY: ES199601	328-001	50.59 Log No.:	72.	48 Log No.: SE00004
Based on the attached d	iscussion, does th	is activity:		
Applicable to 10 CFR 5	0.59 and 10 CFR	72.48 Safety Evaluat	ions	
√YES NO		reviewed safety ques		
YES √NO			Specifications/Licen	
√YES NO	Require a cha	nge or addition to th	e UFSAR/USAR/Tex	chnical Specification Bases?
Applicable to 10 CFR 7	2.48 Safety Evalu	ations		
YES √NO		nificant Increase in C		
YES √NO	Involve a Sig	ρ –	Environmental Impa	
Prepared by: K. C. Ans		tristie	Department: <u>DES-C</u>	<u>Date: 01/25/99</u>
PRINT	ED NAME AND SIG	NATURE		
√YES NO	Is a special rebelongs?	view required by gro	oups other than the gr	roup to which the Preparer
Resp. Ind.: J. L. Stone	<u> </u>	Resp. Indv.: A. L.	Simpson	Resp. Indv.: R. H. Beall
Work Group: Reliability	Eng.	Work Group: Lice	ensing	Work Group: Nuclear Fuels
Signature Date	99	15	1-26.99	Of 21 Bell 1-26-99
- SIGNATURE/BATE		SIGNATURE / I	AIE	SIGNATURE / DATE
A	D:			
(Approved)	Disa	pproved	Approved	Disapproved
Signature J.E. Remen		Sig	gnature <u>Mucha</u> for GS-DES, GS-TI	CS, OPE-PDSU
Date /-27-99	9	Da	te 1-27	-99
The POSRC has review	ed this, evaluation	according to NS-2-1	01.	
POSRC Meeting No.: _	98-00	Date:	2-3-98	
Recommend	Recommend	I		
Approval	Disapproval	Sig	POSRC CH.	Date Z-3-98
Approved	Disapproved	I Sig	gnature PLANT GEN	Date 2/455 ERAL MANAGER
The OSSRC has reviewed	ed this evaluation	according to NS-2-1	00.	•
Full OSSRC Committee	review required?	Yes X No	0	
Signature: WSSR	C SES CHAIRMAN	eliDate:	5/13/99	
If yes, OSSRC Meeting	No.: 99 -	03		

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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 Tech Spec Bases Reviewed: Entire Bases for

the electronic docket. 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.

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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.
- Airports with projected operations greater than 500d² movements per year located within 10 miles of the site and greater than 1000d² 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

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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 and 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

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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:

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.

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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

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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 \sqrt{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.

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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 $1.0x10^{-7}$ 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 \sqrt{NO} Will the proposed activity involve a significant unreviewed environmental impact?

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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 1.0×10^{-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.
- United States Government Flight Information Publication, IFR Enroute High Altitude US Area H-6, January 1996.
- 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), <u>Aircraft Hazards Analysis for the Independent Spent Fuel Storage Installation</u>.
- 5) Reliability Engineering Calculation 97-034 Rev. 3, <u>IPEEE other External Event Analysis</u>.
- NUREG/CR-5042, "Evaluation of External Hazards to Nuclear Power Plants in the United States", U.S. Nuclear Regulatory Commission, 1987.
- Department of Defense Flight Information Publication, High Altitude United States Airport Diagrams -NE, April 1995.
- Department of Defense Flight Information Publication, Low Altitude United States Airport Diagrams -VOL-10, May 1995.
- 9) <u>Data Development Technical Support Document for the Aircraft Crash Risk Analysis Methodology</u> (ACRAM) Standard (Draft). Lawrence Livermore National Laboratory, April 1995.
- 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."

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Summary: (For NRC Report) [continued]

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 5.79x10-8 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 1.0x10-7 per year, are as follows:

One mile circle
 One thousand foot circle
 Number = 245/year
 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.

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 Department: NED-CEU 42-01-04 Date: 10-20-37			
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 Work Group: NFM			
Metacher Marche 10/20/97 Poly Off 10/21/97 MANGEL 10/20/97 SIGNATURE / DATE SIGNATURE / DATE			
Approved Disapproved Disapproved Signature: K.C. Austee K. Lustee Signature: Milarly Lakange INDEPENDENT REVIEWER Signature: October GS-DES GS-TES, or PE-PDSU			
Date 10-22-1997 Date 10.23.97			
The POSRC has reviewed this evaluation according to NS-2-101. POSRC Meeting No.: 97-126 Date: // · 3 · 97			
POSRC Meeting No.: 97-126 Date: //·3·97 Recommend Approval Disapproval Signature: Date //-3-57 POSRC CHAIRMAN			
Approved Disapproved Signature: Date Date Date Date			
The OSSRC has reviewed this evaluation according to NS-2-100.			
Full OSSRC Committee review required? Yes NoX			
Signature: A Lewon Date: 1/30/98 OSSRC SES CHAIRMAN			
If yes, OSSRC Meeting No.:			

 ISFSI - DSC Spacer Disk & Support Rod Material
 72.48 Log No.: SE00005

 D3-DSC-21; 2/129;
 ES199601368
 Supplement 001
 Revision 0000
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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.

ISFSI - DSC Spacer Disk & Suppo	
	rt Rod Material 72.48 Log No.: SE00005
D3-DSC-21; 2/129; ES19	
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	3601368 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.

 ISFSI - DSC Spacer Disk & Support Rod Material
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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.

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 Oconec, 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.

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)

ISFSI - DSC Annulus		2.48 Log No.: SE00006		
A-DSC-2; 3/129;	ES199601368 Supplement 001 Revisio	n 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 NO NO	Involve an unreviewed safety question (USQ)? Involve a change in the Technical Specifications/License Conditions or Bases? Require a change or addition to the UFSAR/USAR?			
Applicable to 10 CFR 72.48 Safety Evaluations				
NO NO	Involve a Significant Increase in Occupational Dose? Involve a Significant Unreviewed Environmental Impact?			
Prepared by: J. E. Remeniuk Department: NED-CEU 42-01-04 Date: 11-7-91 PRINTED NAME AND SIGNATURE				
YES	Is a special review required by groups other than the group to whi	ch the Preparer belongs?		
Resp. Ind.: G. Tesfaye Work Group: Licensin		esp. Indv.: R. H. Beall Vork Group: NFM		
Metachen Desfayett. 11/197 SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE				
Approved Signature: Mark A. M. INDEPENI	MICHAELT	Disapproved Schwar GS-TES, or PE-PDSU STAIN AN TIL		
Date 1/15/91	Date			
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.:	97-/32 Date: //·/9-97			
	commend Signature: POSRC CHAIRMAN	Date //-/9-57		
Approved Dis	sapproved Signature PLANT GENERAL MANAGE	Date <u>//-/9-97</u>		
The OSSRC has reviewed this evaluation according to NS-2-100.				
Full OSSRC Committee review required? Yes No				
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN				
If yes, OSSRC Meeting N	No.:			

ISFSI - DSC Annulus Fill Water	
	72.48 Log No.: SE00006
A-DSC-2; 3/129; ES199601368 Supp	
	lement 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.

ISFSI - DSC Annulus Fill Water 72.48 Log	
	No.: SE00006
A-DSC-2; 3/129; ES199601368 Supplement 001 Revision 0000	

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.

ISFSI - DSC Annulus Fill Water 72.48 Log No.: SE	
ISFSI - DSC Annulus Fill Water 72.48 Log No.: SE	
A-DSC-2; 3/129; ES199601368 Supplement 001 Revision 0000 Page	
A-DSC-2; 3/129; ES199601368 Supplement 001 Revision 0000 Page	

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.

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)

ISFSI - Helium Leak T			72.48 Log No: SE00007
A-DSC-3; 4/129;	E\$199601368 Sup	plement 001 Revis	ion 0000 Page 1 of 5
Based on the attached discu	ssion, does this activity:		
Applicable to 10 CFR 50.59	9 and 10 CFR 72.48 Safety Evaluation	ons	
		 /	
NO 1	Involve an unreviewed safety question	on (USQ)?	
NO 1	Involve a change in the Technical Sp	pecifications/License Cond	tions or Bases?
NO 1	Require a change or addition to the	UFSAR/USAR?	
Applicable to 10 CFR 72.4	8 Safety Evaluations		
	Involve a Significant Increase in Oc		
NO	Involve a Significant Unreviewed E	nvironmental Impact?	
	.001	The state of the s	100101 01 11797
Prepared by: J. E. Remeniu	NAME AND SIGNATURE	Department: <u>NED-CEU</u>	42-01-04 Date: //· 7·97
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The POSRC has reviewed	this evaluation according to NS-2-1	.01.	
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	CHAIRMAN		
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ISFSI - Helium Leak Test Seal Welds 72.48 Log No: SE00007
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
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.

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
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.

ISFSI - Helium Leak Test Seal Welds 72.48 Log N	
	lo: SE00007
A-DSC-3; 4/129; ES199601368 Supplement 001 Revision 0000	
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

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.

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)

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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			
	10 CFR 72.48 Safety Evaluations		
	olve an unreviewed safety question (
	olve a change in the Technical Speci		
Base		SAR/USAR/Technical Specification	
Applicable to 10 CFR 72.48 Safe			
		otional Dana	
	olve a Significant Increase in Occup olve a Significant Unreviewed Envir		
0 1 /			
Prepared by:	Department:	* 67/72/4/	
B. H. Scott# M. Kais	seruddin	Sargent & 2/28/01	
PRINTED NAME AN		Eundy	
YES NO Is a	special review required by groups o	ther than the group to which the	
	parer belongs?	that the group to which the	
Resp. Ind.: G. Tesfaye	Resp. Ind.: R. H. Beall	Resp. Ind.:	
PRINTED NAME	PRINTED NAME	PRINTED NAME	
Water law Only CAT.	I MANORLE		
SIGNATURE	SIGNATURE	SIGNATURE	
Work Group: Licensing	Work Group: NFM	Work Group:	
Date: 03/27/01			
		Date:	
Approved	proved Approved	Disapproved	
Signature (J. E. Remeniuk)		PATEL Provin Robel	
INDEPENDENT RE	VIEWER G	S-DES, GS-TSES, or PE-PDSU	
Date 4.9.0/	Date	4100	
The POSRC has reviewed this ev	valuation according to NS-2-101.		
	01-028	Date: 4/11/0/	
Recommend Recommend Signature Date Var /01			
Approval Disapproval POSRC CHAIRMAN			
Approved Disapproved Signature Date 4/4/01			
PLANT ĞENERAL MANAGER The OSSPC has reviewed this evaluation of the NEGAL MANAGER			
The OSSRC has reviewed this evaluation according to NS-2-100.			
Full OSSRC Committee review required? YES NO NO Signature:			
Signature: Date: 7/17/01 OSSRC SES Chairman			
If yes, OSSRC Meeting No.			
, , , , , , , , , , , , , , , , , , , ,			

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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].

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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

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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.

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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
	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

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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

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ISFSI - Proof Pressure Testing of DSCs

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.

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ACTIVITY: ES 200100120	50.59 Log No.: N/A	72.48 Log No.: SE00008
ISFSI - Proof Pressure Testing of DS	Cs	<u> </u>
☐ YES ⊠ NO May the per previously	ossibility of an accident of a difference evaluated in the SAR be created?	ent type than any
Possibility of New Accident:		
Credible accidents analyzed for the Calhave been discussed previously. Evalua important-to-safety components of ISFS to the design or operation of the NUHO of a different type than any previously expression.	ation of the proposed changes to the I If would maintain their safety function MS system caused by this activity, the	USAR showed that the ons. Since there is no change ne possibility of an accident
Complete for 50.59 and 72.48:		
3. The margin of safety as define	ed in the basis for any Technical S _l	pecification is not reduced.
☐ YES ⊠ NO Will th Specifi	ne margin of safety as defined in the cation be reduced?	e basis for any Technical
Tech Spec Bases: 3.2.2		
Discussion of why the margin of safet	y is not reduced:	
The margin of safety is defined as the raapproved by the NRC as part of the lice and 3.3.2 define the acceptance criteria Therefore, the margin of safety would not be acceptance.	nsing basis and the failure point [Ref for ISFSI components, none of which	f. 17]. USAR Sections 3.2.5
Complete for 72.48:		
☐ YES ⊠ NO Will the pr dose?	coposed activity involve a significat	at increase in occupational
A significant increase in occupational	dose:	
The radiation protection design and ope be changed by this proposed activity. T Because none of these attributes would 7.4-1 would not be affected by this activ	he DSC would maintain the radioact be changed, the occupational doses s	ivity confinement boundary.
☐ YES ⊠ NO Will the pr	roposed activity involve a significar	nt unreviewed

A significant unreviewed environmental impact:

The NUHOMS-24P dry cask storage system confinement and radiological shielding functions would not be reduced by this activity.

environmental impact?

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.

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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
- 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

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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).

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ATTACHMENT 3, POSRC/PRC PRESENTATION FORM

POSRC/PR	RC PRESENTATION F	ORM		
Presentation Date: April 11, 2001				
Presenter: Mohammed Kaiseruddin		Extension: 4120		
Procedures or Activity:		•		
10CFR72.48 Safety Evaluation, Log N	o. SE00008, ISFSI – Proof Pressure	Testing of DSCs		
Purpose of Presentation:	Recommendation In In for Approval	formation		
	Close OI Ex	atend 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: F): Recommend approval of this 1	(See POSRC/PRC Presenter's Guide OCFR72.48 safety evaluation.	EII.F, G. H, and III.A.3 and		

ISFSI - DSC Closure A-DSC-8; 6/129;		9601368 Su	pplement 0	IN1 Revis	72.48 Log	No.: SE00 Page 1 o	
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Based on the attached dis	•	•					
Applicable to 10 CFR 50	0.59 and 10 CFR 7	2.48 Safety Evalua	<u>itions</u>				
NO	Involve on unre	viewed cafety anec	tion (IISO)?				
NO	Involve an unreviewed safety question (USQ)? Involve a change in the Technical Specifications/License Conditions or Bases?						
NO		e or addition to the					
Applicable to 10 CFR 72	2.48 Safety Evalua	<u>ations</u>					
NO	Involve a Signif	icant Increase in (Occupational I	Oose?			
NO		icant Unreviewed					
Prepared by: J. E. Remer	niuk OCA ED NAME AND SIGN	ATURE	Departme	nt: <u>NED-CEU</u>	42-01-04 I)ate: <u>//· 7-</u> ,	97
YES	Is a special revi	ew required by gro	oups other than	the group to	which the Pre	parer belongs?	
Resp. Ind.: G. Tesfay	ye	Resp. Indv.: C.	J. Dobry		Resp. Indv.	: R. H. Beall	
Work Group: Licens	sing	Work Group: I	PES		Work Grou	p: NFM	
Stachen Joshan SIGNATURE / DATE	- ८४१म्पूरा मुक्त	SIGNATURE	/ 11/10/97 DATE	, , , , , , , , , , , , , , , , , , ,	SIGNATI	OU III	1/97
Approved Signature: MALA	Disap Lhught M. NDENYREVIEWER	proved A. LLULLY	Signature:		S. S.	approved Liver PE-PDSU	<u> </u>
Date 11/13/97	······································		Date	II-I	3-97		
The POSRC has reviewe	ed this evaluation	according to NS-2	-101.				
POSRC Meeting No.:	97- <i>132</i>		Date:/_	1.19-97	7		
	ecommend Disapproval	Signature		CHAIRMAN		Date // -/9.	
Approved D	Disapproved	Signature	PLANT C	ENERAL MAI	NAGER	_ Date <u>//-/9</u> -	<u> </u>
The OSSRC has reviewed	ed this evaluation	according to NS-2	-100.				
Full OSSRC Committee review required? Yes No							
Signature: OSSRC S	ES CHAIRMAN	Date:	30/98	-			
If yes, OSSRC Meeting	No.:						

ISFSI - DSC Closure Operations	72.48 Log No.: SE00009
A-DSC-8; 6/129; ES199601368 Supplement 001 Re	

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.

ISFSI - DSC Closure Operations		lo.: SE00009
A-DSC-8; 6/129; ES19960	1368 Supplement 001	

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.

ISFSI - DSC Closure Operations 72.48 Log No A-DSC-8; 6/129; ES199601368 Supplement 001 Revision 0000 P	ege 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
 - 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.

ISFSI - DSC Closure Operations	72:48 Log No.: SE00009
	99601368 Supplement 001 Revision 0000 Page 5 of 5
A-DSC-8; 6/129; ES1	

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)

ISFSI - Guide Sleev	e Corner Weld	Design Cha	nge		72.48 Log	g No.: SE00010
D3-DSC-1; 7/129;	ES199	601368 S	Supplement	001 Revis	sion 0000	Page 1 of 5
Based on the attached di	scussion, does this a	ectivity:				
Applicable to 10 CFR 50).59 and 10 CFR 72	48 Safety Eval	<u>luations</u>			
ИО ИО ИО	NO Involve a change in the Technical Specifications/License Conditions or Bases?					
Applicable to 10 CFR 72	2.48 Safety Evaluat	ions				
NO NO Prepared by: J. E. Reme	Involve a Signific Involve a Signific niuk		ed Environmen	tal Impact?	42-01-04 Г	Date: <u>//-7-97</u>
PRINT	ED NAME AND SIGNA	TURE				
YES	Is a special revie	w required by g	groups other the	an the group to	which the Pre	parer belongs?
Resp. Ind.: G. Tesfa Work Group: Licens	▼	Resp. Indv.: Work Group		/	Resp. Indv. Work Grou	: R. H. Beall pp: NFM
KITAANEN DEN MAN SIGNATURE / DATE	<u> </u>	SIGNATUR	3 (//10/ RE/DATE	97 U	SIGNATI	Sex (1/11/47) URE/DATE
Approved Signature: Mala	Disapp Mult H.A NDENT/REVIEWER	roved	Signature:	for CS-1	LJ. Lo DES CS-TES, of	RANGE PE-PDSU
Date	<i>V</i>		Date	MICHAEL 11-13	5-97	
The POSRC has review	ed this evaluation a	ccording to NS	-2-101.			
POSRC Meeting No.:_	97-132		Date:	11.19.9	7	
_	Recommend Disapproval	Signatu		CALIC C CHAIRMAN		Date <u>//-/9-57</u>
Approved I	Disapproved	Signatu		GENERAL MA	NAGER	Date 1/18-97
The OSSRC has review	ed this evaluation a	ccording to NS	5-2-100.			
Full OSSRC Committee Signature: OSSRC S	e review required? MOVIES CHAIRMAN	Yes Date:	_ , _/_	<u> </u>		
If yes, OSSRC Meeting						

ISFSI - Guide Sleeve Corner Wel	
	d Design Change 72.48 Log No.: SE00010
	19601368 Supplement 001 Revision 0000 Page 2 of 5
D3-DSC-1; 7/129; ES19	99601368 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.

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

ISFSI - Guide Sleeve Corner Weld Des		2.48 Log No.: SE00010
		n 0000 Page 4 of 5
D3-DSC-1; 7/129; ES199601	368 Supplement 001 Revision	

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?

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 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?

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 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?

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.

ISFSI - Guide Sleeve Corner Weld Design Change 72.48 Log No.: SE000	
ISFSI - Guide Sleeve Corner Weld Design Change 72.48 Log No.: SE000	
D3-DSC-1; 7/129; ES199601368 Supplement 001 Revision 0000 Page 5 o	

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)

ISFSI - Guide Sleeve Toler	ance Design Change		72.48 Log No.: SE00011
D3-DSC-2; 8/129;	ES199601368 Supplei	ment 001 Revisi	on 0000 Page 1 of 5
Based on the attached discussion,	does this activity:		
Applicable to 10 CFR 50.59 and 1	0 CFR 72.48 Safety Evaluations		
NO Involve	an unreviewed safety question (U	JSO)?	
NO Involve	a change in the Technical Specif	fications/License Condit	tions or Bases?
NO Require	e a change or addition to the UFS.	AR/USAR?	
Applicable to 10 CFR 72.48 Safet	y Evaluations		
NO Involve	a Significant Increase in Occupa	tional Dose?	
NO Involve	a Significant Unreviewed Enviro	onmental Impact?	
Prepared by: J. E. Remeniuk	CAC DO	epartment: <u>NED-CEU 4</u>	2-01-04 Date: //- 7-97
PRINTED NAMÉ	AND SIGNĀTURĒ		
YES Is a spe	cial review required by groups of	her than the group to w	hich the Preparer belongs?
Resp. Ind.: G. Tesfaye	Resp. Indv.: C. J. Dob	ory	Resp. Indv.: R. H. Beall
Work Group: Licensing	Work Group: PES	N	Work Group: NFM
Metachen Sudaye 50	SIGNATURE / DATE	(10/97 IS	SIGNATURE / DATE
Approved	Disapproved	Approved	Disapproved
Signature: Mark A. Wil		ature: Michael	2 /6/10
INDEPENDENT RE	VIEWER SIGN	LO CGS-DE	SJGS-TES, or PE-PDSU
Date	Date		SAHAN #
The POSRC has reviewed this eva	luation according to NS-2-101.		
POSRC Meeting No.: 97-	/32 Date	: 11.19.97	
Recommend Recommend	d O		
Approval Disapprova		POSRC CHAIRMAN	Date // -/ 8-8)
Approved Disapprove			Date //-/9-9 >
Disappiovo		ANT GENERAL MANA	AGER Date 27-77-97
The OSSRC has reviewed this eva	lluation according to NS-2-100.		
Full OSSRC Committee review re	quired? Yes No	×	
Signature: Semon OSSRC SES CHAIR	Date: 1/30/	98	
If ves. OSSRC Meeting No.:			

ISFSI - Guide Sleeve Tolerance Design Change	
	72.48 Log No.: SE00011
D3-DSC-2; 8/129; ES199601368 Supplement 001 Rev	
D3-DSC-2; 8/129; ES199601368 Supplement 001 Rev	ision 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.

ISFSI - Guide Sleeve Tolerance	Design Change 72.48 Log No.	
D3-DSC-2; 8/129; ES19	9601368 Supplement 001 Revision 0000 P	
	9601368 Supplement 001 Revision 0000 P	
		age 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 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 \pm 0.06" to \pm 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?

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 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? 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 tolerance design change, there will be no increase in the accident dose consequences already described in the USAR.

ISFSI - Guide Sie			72.48 Log N	
D3-DSC-2; 8/129	199601368	Supplement 001		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 \pm 0.06" to \pm 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 \pm 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.

ISFSI - Guide Sleeve Tolerance Design Change 72.48 Log No.: SE00011
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
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)

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 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 / DATE SIGNATURE / DATE SIGNATURE / DATE
Approved Disapproved Signature: Mald. Wight H.A. Willett Signature: Michael J. Salana INDEPENDENT/REVIEWER Signature: Michael J. Gahar H.
Date 11/13/97 Date 11-13-97
The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 97-/32 Date: //·/9-97
Recommend Approval Signature: Date _//-/?-? 7
Approved Disapproved Signature: PLANT GENERAL MANAGER Date //-/۶-۶7
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes No
Signature: Date: 1/30/98 OBSRC SES CHAIRMAN
If ves OSSRC Meeting No.

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
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.

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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" \pm +/- 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.

ISFSI - Spacer Disc Surface Finish Requirements	
	72.48 Log No.: SE00012
D3-DSC-3; 9/129; ES199601368 Supple	ement 001 Revision 0000 Page 4 of 5
	ement 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.

ISFSI - Spacer Disc Surface Finish Requirements	72.48 Log No.: SE00012
D3-DSC-3; 9/129; ES199601368 Supplem	ent 001 Revision 0000 Page 5 of 5
	ent 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)

ISFSI - Grapple Ring	g Material Classification I	Design Change	72.48 Lo	g No.; SE00014
D3-DSC-5; 11/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5
Based on the attached dis	scussion, does this activity:			
	-	valuations		
Applicable to 10 CFR 30.	.59 and 10 CFR 72.48 Safety Ev	'aiuations		
NO	Involve an unreviewed safety			
NO	Involve a change in the Techn	-	nse Conditions or Bas	es?
NO	Require a change or addition t	o the UFSAR/USAR?		
Applicable to 10 CFR 72	.48 Safety Evaluations			
NO	Involve a Significant Increase	in Occupational Dose?		
NO	Involve a Significant Unreview		act?	
Prepared by: J. E. Remen	nink October R	Denartment: NI	ED-CEU 42-01-04 I	Date: 11.7.97
	ED NAME AND SIGNATURE	Doputitiont	2000 12 01 01 1	Jule. 77 7 7
YES	Is a special review required by	groups other than the a	group to which the Pro	eparer belongs?
Resp. Ind.: G. Tesfay	/e Resp. Indv	: C. J. Dobry	Resp. Indv	.: R. H. Beall
Work Group: Licensi	ing Work Grou	ıp: PES	Work Grou	ıp: NFM
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Approved D	isapproved Signa	ture: John (all	Date //-18-57
PLANT GENERAL MANAGER				
The OSSBC has reviewed	ed this evaluation according to N	JS 2 100		
The OBSEC has reviewe	xi this evaluation according to r	45-2-100,		
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Full OSSRC Committee review required? Yes NoX				
Signature:	Signature: M Lemon Date: 1/30/98			
	ES CHAIRMAN			
If yes, OSSRC Meeting	No.:			

ISFSI - Grapple Ring Material Classification Design Change 72.48 Log No.: SE00	
ISFSI - Grapple Ring Material Classification Design Change 72.48 Log No.: SE00	
D3-DSC-5; 11/129; ES199601368 Supplement 001 Revision 0000 Page 2 of	

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.

ISFSI - Grapple Ring Material Classific	ation Design Change 72.48 Log No.: SE00014
D3-DSC-5; 11/129; ES199601	368 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.

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	
D3-DSC-5; 11/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5	
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? 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 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?

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 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?

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.

ISFSI - Grapple Ring Material Cl		
		72.48 Log No.: SE00014
D3-DSC-5; 11/129; ES1	99601368	
	99601368	vision 0000 Page 5 of 5
		vision 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)

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:	2000		
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 Q Col. 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			
Motashar Dospully 1/12/27 JSIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE			
Signature: Mark Disapproved Signature: Mark Disapproved Signature: Michael J. Gahawan MICHAEL J. GAHAW DEF	_		
Date 11/13/97 Date 11-13-97			
The POSRC has reviewed this evaluation according to NS-2-101.			
POSRC Meeting No.: 97-/32 Date: //·/9-97			
Recommend Approval Signature: Date Date			
Approved Disapproved Signature Date //-/9-97 PLANT GENERAL MANAGER	_		
The OSSRC has reviewed this evaluation according to NS-2-100.			
Full OSSRC Committee review required? Yes No			
Signature: Date: 1/30/98/ OSSRC SES CHAIRMAN			
If yes, OSSRC Meeting No.:			

ISFSI - Deletion of Grapple Ring Inside Grinding Requirement	ent 72.48 Log No.: SE00015
D3-DSC-6; 12/129; ES199601368 Supplement 0	
	01 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.

ISFSI - Deletion of Grapple Ring Ins		72.48 Log No.: SE00015
D3-DSC-6; 12/129; ES1996	01368 Supplement 001 Re	vision 0000 Page 3 of 5
		vision 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.

ISFSI - Deletion of Grapple Ring Inside Grinding	Requirement 72.48 Log No.: SE00015
D3-DSC-6; 12/129; ES199601368 St	
	ipplement 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.

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ISFSI - Deletion of Grapple Ring Inside Grinding Requirement 72.48 Log No.:	Control of the Control of Control
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ISFSI - Deletion of Grapple Ring Inside Grinding Requirement 72.48 Log No.:	
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D3-DSC-6; 12/129; ES199601368 Supplement 001 Revision 0000 Page 12/129	ge 5 of 5
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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)

ISFSI - Top & Bott	om Shield Plug Tole	erance Design (hange	72.48 Log N	o.; SE00016
D3-DSC-7; 13/129;	; ES199601	368 Suppler	nent 001 Rev	vision 0000	Page 1 of 5
Based on the attached of	liscussion, does this activ	rity:			
Applicable to 10 CFR 5	50.59 and 10 CFR 72.48	Safety Evaluations			
NO	Involve an unreviewe	d cafety question (I)	SO)3		
NO	Involve a change in t			nditions or Bases?	
NO	Require a change or a	addition to the UFSA	AR/USAR?		
Applicable to 10 CFR	72.48 Safety Evaluations	ł			
NO	Involve a Significant				
NO	Involve a Significant	Unreviewed Enviro	nmental Impact?		
Prepared by: J. E. Rem	eniuk O Control	De De	partment: <u>NED-CE</u>	<u>U 42-01-04</u> Date	: 11.7.97
YES	Is a special review re	quired by groups of	ner than the group t	o which the Prepar	er belongs?
Resp. Ind.: G. Tesf		esp. Indv.: C. J. Dob	гу	Resp. Indv.: R.	
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The POSRC has review	wed this evaluation accor	ding to NS-2-101.			
POSRC Meeting No.:_	97-132	Date		97	
Recommend	Recommend			<i>n</i>	
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Approved	Disappioved	PI	ANT GENERAL M		uc <u>// / / / / / / / / / / / / / / / / / </u>
The OSSRC has review	wed this evaluation accor	ding to NS-2-100.			
Full OSSRC Committe	ee review required? Ye	es No_			
Signature:		Date:			
OSSRC	SES CHAIRMAN				
If ves. OSSRC Meetin	g No.:				

	ield Plug Tolerance Design	Change 72.48 Log No.: SE00016
D3-DSC-7; 13/129;	ES199601368 Supple	ment 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.

ISFSI - Top & Bottom Shield Plug Tolerance Design Change 72.48 Log No.: S	
D3-DSC-7; 13/129; ES199601368 Supplement 001 Revision 0000 Page	
D3-DSC-7; 13/129; ES199601368 Supplement 001 Revision 0000 Page	e 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.

ISFSI - Top & Bottom Shield P		72.48 Log No.: SE00016
D3-DSC-7; 13/129;	S199601368 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?

<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.

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.

ISFSI - Top & Bottom Shield Plug Tolerance Design Change 72.48 Log No.: SE00016	
TOPOL T. O.D. A. O.Y. I. D. T. T. D. D. O.Y. D. T. D.	
D3-DSC-7; 13/129; ES199601368 Supplement 001 Revision 0000 Page 5 of 5	
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)

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				
20-2000 A-720 Control Supplement Con Revision Con Rage No. Control Con				
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: //- 7-97				
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 DATE SIGNATURE DATE SIGNATURE DATE				
Approved Approved Disapproved				
Signature: Hack A. Wright H. A. Haylett Signature: Michael J. Gahance				
Date 11/13/97 Date 11-13-97				
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.: $97-/32$ Date: $//\cdot/9\cdot97$				
Recommend Recommend				
Approval Disapproval Signature Date Date Date				
Approved Disapproved Date Date Date Date PLANT GENERAL MANAGER				
The OSSRC has reviewed this evaluation according to NS-2-100.				
Full OSSRC Committee review required? Yes No				
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN				
If ves OSSRC Meeting No				

	C Lead Casting Full Surface Requirement 72.48 Log No.: SE0001	
	C Lead Casting Full Surface Requirement 72.48 Log No.: SE0001	
	ES199601368 Supplement 001 Revision 0000 Page 2 of	
D3-DSC-8; 14/129;		

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.

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
D3-DSC-8; 14/129; 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 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?

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 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?

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 lead casting full surface requirement design change, there will be no increase in the accident dose consequences already described in the USAR.

	.og No.: SE00017
ISFSI - Deletion of DSC Lead Casting Full Surface Requirement 72.48 L	
D3-DSC-8; 14/129; ES199601368 Supplement 001 Revision 000	
D3-DSC-8; 14/129; ES199601368 Supplement 001 Revision 000	0 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 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.

ISFSI - Deletion of DSC Lead Casting Full Surface Requirement 72.48 Log No.: SE	
D3-DSC-8; 14/129; ES199601368 Supplement 001 Revision 0000 Page	
D3-DSC-8; 14/129; ES199601368 Supplement 001 Revision 0000 Page	

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)

ISFSI - DSC Shell W	Veld Preparation 72.48 Log No.: SE0001	18		
D3-DSC-9; 15/129;	ES199601368 Supplement 001 Revision 0000 Page 1 of	5		
Based on the attached dis	scussion, does this activity:			
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluations			
NO	Involve an unreviewed safety question (USQ)?			
NO NO	Involve a change in the Technical Specifications/License Conditions or Bases? Require a change or addition to the UFSAR/USAR?			
Applicable to 10 CFR 72	2.48 Safety Evaluations			
NO NO	Involve a Significant Increase in Occupational Dose? Involve a Significant Unreviewed Environmental Impact?			
Prepared by: J. E. Remer	Department: NED-CEU 42-01-04 Date: //· 7 · 9 /	7		
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			
Hetachan Schwig SIGNATURE / DATE	SIGNAPORE/DATE SIGNATURE/DATE	17		
Approved Signature: Mach	Disapproved Approved Disapproved Approved Disapproved Approved Disapproved Michael J. Gahar MICHAEL J. GAHAR Disapproved Disapproved Disapproved			
Date ///13/97	Date 11-13-97			
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.:	97-/32 Date: //·/9·97			
	ecommend visapproval Signature: Date Date	<u>87</u>		
Approved D	Date 11-19-19	<u>97</u>		
The OSSRC has reviewed this evaluation according to NS-2-100.				
Full OSSRC Committee review required? Yes NoX				
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN				
If yes, OSSRC Meeting	No.:			

ISFSI - DSC Shell Weld Preparation 72.48 Log No.: SE00018
ISFSI - DSC Shell Weld Preparation 72.48 Log No.: SE00018
D3-DSC-9; 15/129; ES199601368 Supplement 001 Revision 0000 Page 2 of 5
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.

ISFSI - DSC Shell Weld Preparation	72.48 Log No.: SE00018
D3-DSC-9; 15/129; ES199601368 Supplement 001 Revisi	on 0000 Page 3 of 5
D3-DSC-9: 15/129: ES199601368 Supplement 001 Revisi	on 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.

ISFSI - DSC Shell Weld Preparation 72.48 Log No.: SE00018
D3-DSC-9; 15/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5
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.

ISFSI - DSC Shell Weld Preparation		
		72.48 Log No.: SE00018
D3-DSC-9; 15/129; ES19	9601368 Supplement 001 Revi	

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)

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?
NO involve a significant officeviewed Environmental impact?
Prepared by: J. E. Remeniuk October Department: NED-CEU 42-01-04 Date: //- 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
Work Group. Electisting Work Group. PES Work Group. New Allas Of the Control of t
SIGNATURE DATE SIGNATURE DATE SIGNATURE DATE
Approved Approved Disapproved
Signature: Mark Drylt H.A. WIZILAT Signature: Michael J. Sahanan for GS. DES, GS-TES, or PE-PDSU
Date 11/397 Date 11-13-97
The POSRC has reviewed this evaluation according to NS-2-101. POSRC Meeting No.: 97-/32 Date: /// 9-97
TOSKE Meeting No
Recommend Recommend Disapproval Signature: Date 11-18-57
POŚRC CHAIRMAN
Approved Disapproved Signature: Date // 49-97 Date // 49-97
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes NoX
Signature: A Leman Date: 1/30/98 OSSRC SES CHAIRMAN
If yes, OSSRC Meeting No.:

ISFSI - Top Cover Plate Weld Design Changes	
	72.48 Log No.: SE00019
D3-DSC-10; 16/129; ES199601368 Supplement 001 Rev	

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.

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 (Nondestructive 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.

	; 72.48 Log No.:	
ISFSI - Top Cover Plate Weld Design Changes		
D3-DSC-10; 16/129; ES199601368 S	Supplement 001 Revision 0000 Pa	

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.

- 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" I 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:

- 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.

ISFSI - Top Cover Plate Weld Design Change	es 72.48 Log No.: SE00019
D3-DSC-10; 16/129; ES199601368	Supplement 001 Revision 0000 Page 5 of 5
	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)

ISFSI - Siphon Tube	Dimensional Design Cl		72.48 Log No.: SE00020	
D3-DSC-12; 17/129;	ES199601368	Supplement 001 Rev	rision 0000 Page 1 of 5	
Based on the attached disc	•			
Applicable to 10 CFR 50.5	59 and 10 CFR 72.48 Safety E	Evaluations		
NO NO	NO Involve a change in the Technical Specifications/License Conditions or Bases?			
Applicable to 10 CFR 72.4	18 Safety Evaluations			
NO NO Prepared by: J. E. Remeni	10	ewed Environmental Impact?	U 42-01-04 Date: //. 7. 97	
YES		by groups other than the group to	o which the Preparer belongs?	
Resp. Ind.: G. Tesfaye Work Group: Licensin	-	v.: C. J. Dobry oup: PES	Resp. Indv.: R. H. Beall Work Group: NFM	
Matachandrolane A SIGNATURE / DATE	Ville 147 SIGNA	11/10/97 UNE/DATE	AN SULLIUM	
Approved Signature: Hall	Disapproved . Wright M.A. Willed DENT REFIEWER	for GS	Disapproved O. Sahana DES STES, or PEPDSU	
Date		Date	13-97	
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.:	97-132	Date:	97	
	commend sapproval Sign	ature: POSRC CHAIRMAN	Date 11-19-97	
Approved Di	sapproved Sign	PLANT GENERAL M	Date //-/9-97 ANAGER	
The OSSRC has reviewed	d this evaluation according to	NS-2-100.		
Signature:		No <u>X</u> te:// <i>3o/9-8</i>		
OSSRC SE	S CHAIRMAN	•		

		72,48 Log No	
ISFSI - Siphon Tube Dimensional			
D3-DSC-12; 17/129; ES199	9601368 Supplement 001		

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.

SFSI - Siphon Tube Dimensional Design Change 72.48 Log No.: SE00020	
SFSI - Siphon Tube Dimensional Design Change 72.48 Log No.: SE00020	
33-DSC-12: 17/129: ES199601368 Supplement 001 Revision 0000 Page 3 of 5	
)3-DSC-12; 17/129; ES199601368 Supplement 001 Revision 0000 Page 3 of 5	
03-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.

ISFSI - Siphon Tube Dimensional Design Change 72.48 Log No.: SE00	
D3-DSC-12; 17/129; ES199601368 Supplement 001 Revision 0000 Page 4 of	

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.

ISFSI - Siphon Tube Dimensional Design Change 72.48 Log No	
ISFSI - Siphon Tube Dimensional Design Change 72.48 Log No.	
D3-DSC-12; 17/129; ES199601368 Supplement 001 Revision 0000 P	
D3-DSC-12; 17/129; ES199601368 Supplement 001 Revision 0000 P	
D3-DSC-12; 17/129; ES199601368 Supplement 001 Revision 0000 P	

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)

ISFSI - Deletion of D	Drain & Fill Blo	ck Bottom We	ild	7	/2.48 Log	No.: SE00021
D3-DSC-13; 18/129;	ES199	9601368 Su	pplement 00	01 Revisio	on 0000	Page 1 of 5
Based on the attached dis	scussion, does this	activity:				
Applicable to 10 CFR 50	0.59 and 10 CFR 7	2.48 Safety Evalua	ntions			
NO	Involve an unrev	riewed safety ques	tion (USQ)?			
NO	Involve a change	e in the Technical	Specifications/		ons or Bases	?
NO	Require a chang	e or addition to th	e UFSAR/USA	R?		
Applicable to 10 CFR 72	2.48 Safety Evalua	<u>tions</u>				
NO		icant Increase in C				
NO	Involve a Signif	icant Unreviewed	Environmental	Impact?		
Prepared by: J. E. Remer	niuk OCA		Departmen	t: <u>NED-CEU 42</u>	-01-04 Da	te: <u>//·<i>7</i>·97</u>
PRINTE	ED NAME AND SIGN	ATURE				
YES	Is a special review	ew required by gro	ups other than	the group to wh	ich the Prepa	arer belongs?
Resp. Ind.: G. Tesfay	,	Resp. Indv.: C.			Resp. Indv.:	
Work Group: Licens	ing	Work Group: F	ES	\ \	Work Group	NFM
SIGNATURE / DATE	(1/10/19)	SIGNATURE	11/10/97	_ 110	SIGNATUR	<u>U1/11/47</u>
Approved	, Disan	proved	(An	proved	Disa	proved
Signature: Hail	1. 1/1/	1.D. Llanger	Signature:	. 0 00) Hall	A and a
INDEPEN	NDENT REVIEWER	(inchite in it	-		GS-TES, or P	E-PDSU
Date 11/13/97		· · · · · · · · · · · · · · · · · · ·	Date	11-13-9	> CAHA	——————————————————————————————————————
The POSRC has reviewe	ed this evaluation a	according to NS-2	-101.			
POSRC Meeting No.:	97-132		Date://	1.19.97	•	
Recommend Re	ecommend		01		_	
Approval D	isapproval	Signature:	POSRC C	CHAIRMAN	I	Date <u>//-/9-97</u>
Approved / D	isapproved	Signature	John To	link	1	Date //-/9-97
			PLANT GE	ENERAL MANA		
The OSSRC has reviewed this evaluation according to NS-2-100.						
Full OSSRC Committee	review required?	Yes	NoX			
Signature: ASSRC SI	MONN ES CHAIRMAN	Date:	1/30/98			
If ves. OSSRC Meeting	No ·					

ISFSI - Deletion of Drain & Fill Bl		
	72.48 Log No.: SE00	
D3-DSC-13; 18/129; ES19		
	ent 001 Revision 0000 Page 2 o	

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.

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.

ISFSI - Deletion of Drain & Fill Block Bottom Weld 72.48 Log No.	
ISFSI - Deletion of Drain & Fill Block Bottom Weld 72.48 Log No.	
D3-DSC-13; 18/129; ES199601368 Supplement 001 Revision 0000	
D3-DSC-13; 18/129; ES199601368 Supplement 001 Revision 0000	

- 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.

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)

ISFSI - DSC Maximu	ım Length Design Change	72.48 Log No.: SE00022	
D3-DSC-14; 19/129;	ES199601368 Supplement 001 Revision	on 0000 Page 1 of 5	
Based on the attached dis	scussion, does this activity:		
Applicable to 10 CFR 50	2.59 and 10 CFR 72.48 Safety Evaluations		
NO NO NO	Involve an unreviewed safety question (USQ)? Involve a change in the Technical Specifications/License Conditi Require a change or addition to the UFSAR/USAR?	ions or Bases?	
Applicable to 10 CFR 72	.48 Safety Evaluations		
NO NO Prepared by: <u>J. E. Remer</u>		<u>J 42-01-04</u> Date: //· 7· 97	
PRINTE YES	Is a special review required by groups other than the group to wh	nich the Prenarer helongs?	
Resp. Ind.: G. Tesfay Work Group: Licensi		Resp. Indv.; R. H. Beall Work Group: NFM	
Melachan Just My & SIGNATURE DATE	SIGNAPORE/DATE	F3/DU///197 SIGNATURE/DATE	
Approved Signature: Mark		Disapproved Salary Salary Salary Salary Disapproved	
Date 11/13/97	Date MICHAEL	J. GAHANZIL	
The POSRC has reviewe	ed this evaluation according to NS-2-101.		
POSRC Meeting No.:	97-/32 Date: //-/9-97	7	
	ecommend isapproval Signature POSRC CHAIRMAN	Date 11-19-97	
Approved D	isapproved Signature: PLANT GENERAL MANA	Date <u>// -/9 - 87</u>	
The OSSRC has reviewe	ed this evaluation according to NS-2-100.		
Full OSSRC Committee review required? YesNo			
Signature: OSSRC S	ES CHAIRMAN Date: 1/30/98		
If ves OSSRC Meeting	No :		

FSI - DSC Maximum Length Design Change 72.48 Log No.: SE00022	
3-DSC-14; 19/129; ES199601368 Supplement 001 Revision 0000 Page 2 of 5	
3-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.

ISFSI - DSC Maximum Length Design Change 72.	
	48 Log No.: SE00022
D3-DSC-14; 19/129; ES199601368 Supplement 001 Revision	

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.

	ign Change 72.48 Log No.: SE00022
ISFSI - DSC Maximum Length Des	
	601368 Supplement 001 Revision 0000 Page 4 of 5
D3-DSC-14; 19/129; ES199	601368 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.

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)

ISFSI - Shield Plug I	Keyway Design Change 72.48 Lo	g No.: SE00023	
D3-DSC-16; 20/129;	ES199601368 Supplement 001 Revision 0000	Page 1 of 5	
Based on the attached dis	scussion, does this activity:		
Applicable to 10 CFR 50.	.59 and 10 CFR 72.48 Safety Evaluations		
NO NO NO	Involve an unreviewed safety question (USQ)? Involve a change in the Technical Specifications/License Conditions or Base Require a change or addition to the UFSAR/USAR?	es?	
Applicable to 10 CFR 72.	.48 Safety Evaluations		
NO NO	Involve a Significant Increase in Occupational Dose? Involve a Significant Unreviewed Environmental Impact?		
Prepared by: J. E. Remen	Department: NED-CEU 42-01-04 Department: NED-	Date: 11.7.97	
YES	Is a special review required by groups other than the group to which the Pre	parer belongs?	
Resp. Ind.: G. Tesfay Work Group: Licensi		: R. H. Beall p: NFM	
Hatachen Infayer SIGNATURE DATE	SIGNATURE / DATE / SIGNATURE / DATE / SIGNATURE / DATE	<u>U1/11/47</u> JRE/DATE	
Signature: Mark Approved Signature: Mark Approved INDEPEN Date 11/13/97	Disapproved Disapp	PE-PDSU	
The POSRC has reviewed	d this evaluation according to NS-2-101.		
POSRC Meeting No.:	97-/32 Date: //·/9·97		
	ecommend isapproval Signature: POSRC CHAIRMAN	Date <u>//-/5-57</u>	
Approved Di	isapproved Signature: PLANT GENERAL MANAGER	Date//-/9-93	
The OSSRC has reviewed this evaluation according to NS-2-100.			
Signature:	review required? Yes NoX Pare: Date: /30/9 8 ES CHAIRMAN		
If yes, OSSRC Meeting 1	No.:		

ISFSI - Shield Plug Keyway Desig		72.48 Log No.: SE00023
D3-DSC-16; 20/129; ES19	9601368 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.

ISFSI - Shield Plug Keyway Design Change	
	72.48 Log No.: SE00023
D3-DSC-16; 20/129; ES199601368 Supplemen	
	it 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

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.

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
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)

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?
require a change of addition to the of State of State.
Applicable to 10 CFR 72.48 Safety Evaluations
NO Involve a Significant Increase in Occupational Dose?
NO Involve a Significant Unreviewed Environmental Impact?
0110
Prepared by: J. E. Remeniuk Department: NED-CEU 42-01-04 Date: 1/- 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
1 1 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2
Machen Despay 10 11/19/19 11/19/97 11/11/19/19
SIGNATURE / DATE / SIGNATURE / DATE / SIGNATURE / DATE
Approved Approved Disapproved
Signature: Mal A. L. L. L. L. L. L. L. Signature: Mullily. Salanton INDEPENDENT NEVIEWER Signature: Mullily Solds GS-DES GS-TES, or PE-PDSU
MICHAELJ. GAHANZIL
Date 11-13-9 /
The POSRC has reviewed this evaluation according to NS-2-101.
POGRAM : 37 - 47 - 47 - 47 - 47 - 47 - 47 - 47 -
POSRC Meeting No.: 97-/32 Date: //·/9·97
Recommend Recommend
Approval Disapproval Signature / Carell Date Date
POSRC CHAIRMAN
Approved Disapproved Signature the Canell Date 11-19-87
PLANT GENERAL MANAGER
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes No
Signature: 1/30/98
OSSEC SES CHAIRMAN
If ves. OSSRC Meeting No.:

ISFSI - Realignment of Top Cover Plate Lifting Holes 72.48 Log No.: SE00024
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.

	72.48 Log No.: SE00024
ISFSI - Realignment of Top Cover	
D3-DSC-17; 21/129; ES19	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.

ISFSI - Realignment of Top Cover Plate Lifting He	oles 72.48 Log No.: SE00024
D3-DSC-17; 21/129; ES199601368 Sup	
	pplement 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.

ISFSI - Realignment of Top Cover Plate Lifting Holes 7:	2.48 Log No.: SE00024
D3-DSC-17; 21/129; ES199601368 Supplement 001 Revision	
	n 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.

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)

ISFSI - Addition of Shi	eld Plug Backing Bar		72.48 Log No.: SE00025
D3-DSC-18; 22/129;	ES199601368 S	Supplement 001 Revi	sion 0000 Page 1 of 5
Based on the attached discus	ssion, does this activity:		
Applicable to 10 CFR 50.59	and 10 CFR 72.48 Safety Eva	<u>luations</u>	
	nvolve an unreviewed safety qu	estion (USQ)? al Specifications/License Cond	1:4: D9
	equire a change or addition to		artions of Dases?
Applicable to 10 CFR 72.48	Safety Evaluations		
	nvolve a Significant Increase in avolve a Significant Unreviewe		
Prepared by: J. E. Remeniuk PRINTED N	AME AND SIGNATURE	Department: <u>NED-CEU</u>	42-01-04 Date: 11-7-97
YES Is	a special review required by g	groups other than the group to	which the Preparer belongs?
Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: Work Group	•	Resp. Indv.: R. H. Beall Work Group: NFM
Metachen Stelland H SIGNATURE / DATE	u/n/g? SIGNATUR	<u> </u>	HADUUU1197 SIGNATURE/DATE
Approved Signature: Mach A INDEPENDENT Date 11/13/97	Disapproved Just M.A. Wally H NT REVIEWER	Signature: Muhall Jorgs I	Disapproved Disapproved Disapproved Disapproved Disapproved
The POSRC has reviewed th	nis evaluation according to NS	-2-101.	
POSRC Meeting No.:	97-/32	Date://. /9 - 9	7
_	mmend pproval Signatur	re: The Carlo POSRC CHAIRMAN	Date <u>//-/8-97</u>
Approved Disap	proved Signatu	PLANT GENERAL MAI	Date <u>//-/5-51</u> NAGER
The OSSRC has reviewed th	nis evaluation according to NS	-2-100.	
Full OSSRC Committee review required? Yes NoX			
Signature: OSSRC SES C	Date:	1/30/98	
If yes, OSSRC Meeting No.:	:		

	Shield Plug Backing Ba		48 Log No.: SE00025
D3-DSC-18; 22/129			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.

ISFSI - Addition of Shield Plug Ba	cking Bar 72.48 Log No.: SE00025
D3-DSC-18; 22/129; ES199	0601368 Supplement 001 Revision 0000 Page 3 of 5
	9601368 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.

######################################	
ISFSI - Addition of Shield Plug Backing Bar	72.48 Log No.: SE00025
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######################################	Kanna Kansaraa kanka ka ka ka kakarka kawa kausakawawawawa wasa wasi asassasa Utasa Sansa Sansassa Mariwan 1 👚
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D3-DSC-18; 22/129; ES199601368 Supplemen	t 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.

ISFSI - Addition of Shield Plug Backing Bar	72.48 Log No.: SE00025
D3-DSC-18; 22/129; ES199601368 Supplement 001 Revis	

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)

ISFSI - Top Shield F	Plug Casing Plate Thickness 1	Folerance Change	72.48 Log No.; SE00026
D3-DSC-19; 23/129;	; ES199601368 Sup	plement 001 Revis	ion 0000 Page 1 of 5
Based on the attached dis	scussion, does this activity:		
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluation	<u>ions</u>	
NO	Involve an unreviewed safety questi		
NO NO	Involve a change in the Technical S Require a change or addition to the		tions of Bases?
Applicable to 10 CFR 72	2.48 Safety Evaluations		
NO NO	Involve a Significant Increase in Oc Involve a Significant Unreviewed E		
	0-20	-	10 01 01 D
Prepared by: <u>J. E. Remer</u> PRINTE	ED NAME AND SIGNATURE	Department:_ <u>NED-CEU </u>	42-01-04 Date: //. 7.97
YES	Is a special review required by grou	ps other than the group to w	which the Preparer belongs?
Resp. Ind.: G. Tesfay Work Group: Licens		•	Resp. Indv.; R. H. Beall Work Group: NFM
Sutachen Defougl &	1/1/2/27 J. SHENATURE / E	11/10/97 W	SIGNATURE / DATE
Approved Signature: Mark	Disapproved Wight H.A. W. R. L. H.T. NDENT SEVIEWER	Approved Signature: Muhaul For GS-D MICHAEL	Disapproved J. Lanar ESGS-TES, or PE-PDSU J. GAHARIL
Date <u>(1//3/97</u>		Date 11-13	3-97
The POSRC has reviewed	ed this evaluation according to NS-2-1	101.	
POSRC Meeting No.:	<u>97-/32</u>	Date:	<u> </u>
	ecommend bisapproval Signature:	POSRC CHAIRMAN	Date <u>//-/9-97</u>
Approved D	Pisapproved Signature:	PLANT GENERAL MAN	Date <u>//-/97</u>
The OSSRC has reviewed	ed this evaluation according to NS-2-1	100.	
Full OSSRC Committee review required? Yes No			
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN			
If ves. OSSRC Meeting	No:		

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.

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.

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.

ISFSI - Top Shield Plug Casing Plate Thickness Tolerance Change 72.48 Log No	o.: SE00026
D3-DSC-19; 23/129; ES199601368 Supplement 001 Revision 0000 P	
	age 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)

ISFSI - DSC Weld U	lpgrades			72.48	Log No.: SE00027
D3-DSC-20; 24/129	; ES199	9601368 Su	pplement 001	Revision 00	000 Page 1 of 5
Based on the attached di	scussion, does this	activity:			
Applicable to 10 CFR 50	0.59 and 10 CFR 7	2.48 Safety Evalua	ations		
NO		viewed safety ques			
NO NO			Specifications/Licer e UFSAR/USAR?	se Conditions or	r Bases?
Applicable to 10 CFR 72	2.48 Safety Evalua	tions			
NO NO			Occupational Dose? Environmental Impa	nct?	
Prepared by: J. E. Remer	- 1	R	•		4 Date: 11-7-97
YES			oups other than the g	roup to which th	e Preparer belongs?
Resp. Ind.: G. Tesfay Work Group: Licens	,	Resp. Indv.: C. Work Group: I			Indv.: R. H. Beall Group: NFM
Marken July of SIGNATURE POATE	11/12/97 _	SIGNATURE	11/10/47 DATE	OH X	NATURE/DATE
Approved Signature: Hall A INDEPER		proved 1. LARIGHT	Signature: Much	harly.	Disapproved Salargu ES, or PE-PDSU HHAN III.
The POSRC has reviewe	ed this evaluation a	according to NS-2	-101.		
POSRC Meeting No.:	97-/32	-	Date:	19-97	
	ecommend isapproval	Signature:	POSRC CHAI	RMAN	Date <u>//-/9-57</u>
Approved D	isapproved	Signature	PLANT GENER	AL MANAGER	Date <u>//-//-41</u>
The OSSRC has reviewed	ed this evaluation a	according to NS-2	-100.		
Full OSSRC Committee	review required?	Yes	No X		
Signature: OSSRC S	ES CHAIRMAN	Date:	130/98		
If yes, OSSRC Meeting	No.: .:				

ISFSI - DSC Weld Up		8 Log No.: SE00027
D3-DSC-20; 24/129;		
	Supplement 001 Revision 0	

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:

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.

ISFSI - DSC Weld Upgrades 72.48 Lo	g No.: SE00027
D3-DSC-20; 24/129; ES199601368 Supplement 001 Revision 0000	
D3-DSC-20; 24/129; ES199601368 Supplement 001 Revision 0000	

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 <u>DSC Closure Welds</u> - 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.

SFSI - DSC V		
		72.48 Log No.: SE00027
D3-DSC-20; 2		601368 Supplement 001 Revision 0000 Page 5 of 5
		601368 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 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)

ISFSI - DSC Guide Sleeve Ins	ide Dimension Nor	ı Conformance	72.48 Log	I No.: SE00028		
D4-DSC-1; 25/129; E	S199601368 Su	pplement 001 R	evision 0000	Page 1 of 5		
Based on the attached discussion, do	es this activity:					
Applicable to 10 CFR 50.59 and 10 0	CFR 72.48 Safety Evalua	<u>itions</u>				
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 I	•					
	Significant Increase in C Significant Unreviewed			·		
Prepared by: J. E. Remeniuk PRINTED NAME AN	D SIGNATURE	Department: <u>NED-C</u>	EU 42-01-04 D	ate: //. 7. 97		
YES Is a specia	nl review required by gro	ups other than the group	to which the Pre	parer belongs?		
Resp. Ind.: G. Tesfaye Work Group: Licensing	Resp. Indv.: C. Work Group: P		Resp. Indv. Work Grou	: R. H. Beall p: NFM		
Katachan Destanto 11/12/97 SIGNATURE DATE	SIGNAPHRE /	11/10/97 DATE	JH 97.19 SIGNATU	PU 11/11/47 DRE/DATE		
Signature: Man A. Multi- INDEPENDENT REVIS	Disapproved MALLALLAT EWER	Approved Signature: Mich	CS-DES GS-TES, or	Approved RANGE PE-PDSU AN EL		
Date <u>i1/13/97</u>		Date (1)	13-97			
The POSRC has reviewed this evalu	ation according to NS-2-	-101.				
POSRC Meeting No.: 97-1	32	Date:	· <i>97</i>			
Recommend Recommend Disapproval	Signature:	POSRC CHAIRMA	UC_	Date <u>//-/۶-۶</u>		
Approved Disapproved	Signature:	PLANT GENERAL	MANAGER	Date 11-18-87		
The OSSRC has reviewed this evalu	ation according to NS-2	-100.				
Full OSSRC Committee review required? Yes NoX						
Signature: Jemon OSSRC SES CHAIRM	Date:	1/30/98				
If yes, OSSRC Meeting No.:						

SC Guide Sl			
			lo.: SE00028
1; 25/129;			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.

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 $\{0.0675^{\circ} - (0.025^{\circ} / 2)\} = 0.0675^{\circ} - 0.0125 = 0.0550^{\circ}$. 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.

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			48 Log No.: SE00028
D4-DSC-1			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 guide sleeve inside dimension non conformance, there will be no increase in the accident dose consequences already described in the USAR.

- 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.

ISFSI - DSC Guide Sleeve Inside Dimension Non Conformance 72.48 Log No.:	
D4-DSC-1; 25/129; ES199601368 Supplement 001 Revision 0000 Pa	
D4-DSC-1; 25/129; ES199601368 Supplement 001 Revision 0000 Pa	

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) 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)

ISESI DEC BOHOM	n Interior Seal Weld Non Conformance 72	48 Log No.: SE00030
ISFSI * DSC BUILDIII	in interior Sear Weld Worr Conflormatice 72	40 EUG NO.: 3EUUU30
D4-DSC-3; 27/129;	ES199601368 Supplement 001 Revision	1 0000 Page 1 of 5
Based on the attached di	iscussion, does this activity:	
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluations	
NO	Involve an unreviewed safety question (USQ)?	
NO NO	Involve a change in the Technical Specifications/License Condition Require a change or addition to the UFSAR/USAR?	ns or Bases?
NO	Require a change of addition to the Orsak/Osak/	
Applicable to 10 CFR 72	2.48 Safety Evaluations	
NO	Involve a Significant Increase in Occupational Dose?	
NO	Involve a Significant Unreviewed Environmental Impact?	
Prepared by: J. E. Remer	Department: NED-CEU 42-0	01-04 Date: //· 7-97
YES	Is a special review required by groups other than the group to which	th the Preparer belongs?
Resp. Ind.: G. Tesfa	•	esp. Indv.: R. H. Beall
Work Group: Licens	sing Work Group: PES W	fork Group: NFM
SIGNATURE DATE	SMCHATURE/DATE / 11/10/97	SIGNATURE / DATE
Approved)	Disapproved Approved	Disapproved
Signature: Mark	A. Duylet M.A. Walley Signature: Michael S	Yakara
	ENDENT DEVIEWED	GS-TES, or PE-PDSU
Date 11/13/97	Date 11-13	-97
The POSRC has review	ved this evaluation according to NS-2-101.	
POSRC Meeting No.:_	97-/32 Date: //·/9·97	
Recommend R	Recommend	
Approval D	Disapproval Signature: POSRC CHAIRMAN	Date //-/5-57
Approved D	Disapproved Signature PLANT GENERAL MANAG	Date <u>// -/9-97</u>
El Occupos		
	wed this evaluation according to NS-2-100.	
ruii OSSKC Committee	experiew required? Yes NoX	
Signature: OSSRC S	Date: 1/30/98 SES CHAIRMAN	
If yes OSSRC Meeting	a No ·	

ISFSI - DSC Bottom Interior Seal Weld Non Confo	rmance 72,48 Log No.: SE00030
D4-DSC-3; 27/129; ES199601368 Supp	plement 001 Revision 0000 Page 2 of 5
	plement 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.

SFSI - DSC Bottom Interior Seal			72.48 Log No.: SE00030
	9601368 Supplei		sion 0000 Page 3 of 5
D4-DSC-3; 27/129; ES19		ment 001 Revis	

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.

			72.48 Log No.: SE00030
		Weld Non Conf	
D4-DSC-3			sion 0000 Page 4 of 5

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

Consequences of Accident:

* p.

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
 - 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.

	ttom Interior Seal Wel		B Log No.: SE00030
		1368 Supplement 001 Revision 0	
D4-DSC-3; 27/1			

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)

ISFSI - Upper & Low D3-TC-1; 30/129;	er Trunnion De ES1990		s oplement 00		/2.48 Log No.: SE00033 on 0000 Page 1 of 5		
					o en recent de l'architecture		
	Based on the attached discussion, does this activity:						
Applicable to 10 CFR 50.	.59 and 10 CFR 72.	.48 Safety Evalua	<u>tions</u>				
NO	Involve an unrevi		,	r t			
NO Involve a change in the Technical Specifications/License Conditions or Bases? NO Require a change or addition to the UFSAR/USAR?							
NO	Require a change	or addition to the	UFSAR/USA	K?			
Applicable to 10 CFR 72	.48 Safety Evaluati	ions					
NO	Involve a Signific	ant Increase in O	ecupational Do	ose?			
NO	Involve a Signific						
-10	- 1				_		
Prepared by: J. E. Remen	niuk O Colona Ed name and signa	TURE	Departmen	t: NED-CEU 42	-01-04 Date: //- 7-97		
YES	Is a special review	w required by gro	ups other than	the group to wh	ich the Preparer belongs?		
Resp. Ind.: G. Tesfay	?e	Resp. Indv.: C.	I Dohry		Resp. Indv.: R. H. Beall		
Work Group: Licensi		Work Group: P			Work Group: NFM		
Trong Group, Electric	···· <i>6</i>		1.	N	10,011		
Setashen Lastorf & SIGNATURE / DATE	1./12/97 _	SIGNATURE /	11/10/97 DATE	Wh	SIGNATURE/DATE		
	_	_					
Approved	Disapp	roved	Ap	proved	Disapproved		
Signature: M N N INDEPEN	NDENT REVIEWER	Ton M.Wood§ield		for GS-DES	J. Yahma ES-TES, or PE-PDSU		
Date	197		Date	TICHAEL .	J. GAHAN III. -97		
The POSRC has reviewe	ed this evaluation a	ccording to NS-2-	101.				
POSRC Meeting No.:	97-134		Date:/	1.24.97			
			- /				
	ecommend	a: . (~ M	Pur 11-2453		
Approval D	ísapproval	Signature:	POSRC C	CHAIRMAN	Date 11-245)		
Approved D	isapproved	Signature:	PLANT G	ENTRAL MANA	Date 1/2/5)		
The OSSRC has reviewed	ed this evaluation a	ccording to NS-2	-100.	V			
Full OSSRC Committee	review required?	Yes	No X				
Signature: OSSRC S	Omern/ ES CHAIRMAN	Date:/	130/98				
If yes, OSSRC Meeting	No:						

ISFSI - Upper & Lower Trunnion Design Changes 72:48 Log No.: SE	
ISFSI - Upper & Lower Trunnion Design Changes 72:48 Log No.: SE	
D3-TC-1; 30/129; ES199601368 Supplement 001 Revision 0000 Page	
D3-TC-1; 30/129; ES199601368 Supplement 001 Revision 0000 Page	

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.

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.

ISFSI - Upper & Lower Trunnion Design Changes	72.48 Log No.: SE00033
D3-TC-1; 30/129; ES199601368 Supplement 001 Revision	

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.

o.: SE00033
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) 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)

ISFSI - Upper Truni	nion Structural Shell Upper	Section Design Chang	ge 72.48 Log No.: SE00034
D3-TC-2; 31/129;	ES199601368 S	applement 001 Rev	rision 0000 Page 1 of 5
Based on the attached di	scussion, does this activity:		
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evalu	<u>ations</u>	
NO	Involve an unreviewed safety que		
NO NO	Involve a change in the Technica Require a change or addition to the	-	iditions or Bases?
Applicable to 10 CFR 72	2.48 Safety Evaluations		
NO NO	Involve a Significant Increase in Involve a Significant Unreviewed		
Prepared by: J. E. Reme	niuk OCCLERATION OF THE PROPERTY OF THE PROPER	Department: <u>NED-CE</u>	U 42-01-04 Date: 11- 7- 97
YES	Is a special review required by gr	oups other than the group to	which the Preparer belongs?
Resp. Ind.: G. Tesfa Work Group: Licens			Resp. Indv.: R. H. Beall Work Group: NFM
SIGNATURE / DATE	signature	11/10/47 h	MANGULET SIGNATURE / DATE
Approved	Disapproved	Approved	Disapproved
Signature: Sm // K	Northell-Ton N.Word Fie	Mignature: Mulua for Es	DESIGN TES, or PE-PDSU
Date	12/97		13-97
The POSRC has review	ed this evaluation according to NS-2	2-101.	
POSRC Meeting No.:_	97-13 <i>4</i>	Date:	<u>.97</u>
	Recommend Disapproval Signature	POSRC CHAIRMAN	Date 11-2 4-97
Approved	Disapproved Signature	PLANT GENERAL M.	ANAGER Date 1/21/57
The OSSRC has review	red this evaluation according to NS-	2-100.	
$O_{\mathcal{L}}$	e review required? Yes Semon Date:	1	
Signature: OSSRC'S	ES CHAIRMAN	1130/70	
If ves OSSRC Meeting	No ·		

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.

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.

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.

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)

ISFSI - Upper Trun	nion Sleeve W	leld Design Ch	nange		72.48 Lo	g No.: SE00035
D3-TC-3; 32/129;	ES19	9601368 S	upplement	001 Revi	sion 0000	Page 1 of 5
Based on the attached d	iscussion, does thi	s activity:				
Applicable to 10 CFR 5	0.59 and 10 CFR	72.48 Safety Evalu	uations			
NO	Involve an unre	eviewed safety que	stion (USQ)?			
NO	Involve a chang	ge in the Technica	l Specificatio	ns/License Cond	ditions or Bas	es?
NO	Require a chan	ge or addition to t	he UFSAR/U	SAR?		
Applicable to 10 CFR 7	2.48 Safety Evalu	<u>iations</u>				
NO		ificant Increase in				
NO	Involve a Signi	ificant Unreviewed	i Environmen	ital Impact?		
Prepared by: J. E. Reme	eniuk QC&	Æ	Departn	nent: NED-CEU	42-01-04 I	Date: <u>//-7-97</u>
PRINT	ED NAME AND SIG	NATURE				,
YES	Is a special rev	iew required by gr	roups other th	an the group to	which the Pre	eparer belongs?
Resp. Ind.: G. Tesfa	aye	Resp. Indv.: C	C. J. Dobry		Resp. Indv	: R. H. Beall
Work Group: Licen	sing	Work Group:	PES		Work Grou	ip: NFM
Matachen Les Auge SIGNATURE / DATE	W 1/21/47	SIGNATURE	//////////////////////////////////////	M Us	SIGNAT	<u> </u>
Approved		pproved		Approved	Dis	sapproved
Signature: INDEPE	Modfiell- Endergreviewer	<u>Ton Nilsonts</u> re	e Signature:	Michael Michael	DES GS-TES, o	Ravan PE-PDSU
Date	2/97	·		(1-)		
The POSRC has review	ved this evaluation	according to NS-	2-101.			
POSRC Meeting No.:_	97-13.	4	Date:	11.24.	97	
Recommend I	Recommend		011			•
Approval I	Disapproval	Signatur		C CHAIRMAN		Date //-27-87
Approved 1 I	Disapproved	Signatur	e: PLANT	GÉNERAL MA	NAGER	Date 11/21/97
The OSSRC has review	ved this evaluation	according to NS-	2-100.			
Full OSSRC Committe	e review required	? Yes	No_X			
Signature: OSSRC	<u>Nemovi</u> SES CHAIRMAN	Date:	1/30/9	8		
If ves OSSRC Meeting	No ·					

	Weld Design Chan	ge 72.48 Log No.: SE00035
	199601368 Supr	
D3-TC-3; 32/12		
		plement 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.

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.

ISFSI - Upper Trunnion Sleeve Weld Design Change 72.48 Log No.	
ISFSI - Upper Trunnion Sleeve Weld Design Change 72,48 Log No	
D3-TC-3; 32/129; ES199601368 Supplement 001 Revision 0000	
D3-TC-3; 32/129; ES199601368 Supplement 001 Revision 0000 I	
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.

SFSI - Upper Trunnion Sleeve W			
			72.48 Log No.: SE00035
)3-TC-3; 32/129; ES19			
	9601368 Supple	ment 001 Revis	ion 0000 Page 5 of 5
			ion 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)

ISFSI - Lower Trunn	ion Sleeve Design (hanges		72,48 Log No,: SE0003	6
D3-TC-4; 33/129;	ES19960136	88 Suppleme	nt 001 Revi	sion 0000 Page 1 of	5
Based on the attached dis	cussion, does this activity				
Applicable to 10 CFR 50.	59 and 10 CFR 72.48 Saf	ety Evaluations			
NO	Involve an unreviewed s	afety question (USO)?		
NO	Involve a change in the			litions or Bases?	
NO	Require a change or add	lition to the UFSAR/	USAR?		
Applicable to 10 CFR 72	48 Safety Evaluations				
NO	Involve a Significant Inc				
NO	Involve a Significant Ur	nreviewed Environm	ental Impact?		
Prepared by: J. E. Remen	iuk O CONTROL SIGNATURE	Depar	tment: <u>NED-CEU</u>	42-01-04 Date: //- 7-9	Z
YES		ired by groups other	than the group to	which the Preparer belongs?	
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Resp. Ind.: G. Tesfay Work Group: Licensi	•	. Indv.: C. J. Dobry k Group: PES		Resp. Indv.: R. H. Beall Work Group: NFM	
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Signature: INDEPEN	vollell-Ton N.C. Dem reviewer	<i>bod Field</i> bignatur	e. Muhail	J. Saharan DES, OS-TES, OF PE-PDSU J. GAHAN III	
Date	197	_ Date		3-97	
The POSRC has reviewe	d this evaluation accordin	g to NS-2-101.			
POSRC Meeting No.:	97-134	Date:	11.24-	97	
Recommend Re	commend				
Approval Di	sapproval	Signature:	RC CHAIRMAN	Date 11-24-	<u>97</u>
		POS	CHAIRMAN	/ /	
Approved Disapproved Signature: Date Date					
The OSSRC has reviewed this evaluation according to NS-2-100.					
Full OSSRC Committee review required? Yes NoX					
Signature: Date: 1/30/98 OSSRC'SES CHAIRMAN					
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ISFSI - Lower Trunnion Sleeve Design Changes 72.48 Log No.: S	
D3-TC-4; 33/129; ES199601368 Supplement 001 Revision 0000 Pag	e 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.

ISFSI - Lower Trunnion Sleeve Des		Log No.: SE00036
D3-TC-4; 33/129; ES199		
	601368 Supplemen	

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.

ISFSI - Lower Trunn			
			No.: SE00036
D3-TC-4; 33/129;	ES199601:		
		t 001 Revision 0000	

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.

ISFSI - Lower Trunnion Sleeve I			
			Log No.; SE00036
D3-TC-4; 33/129; ES1	99601368 Suppleme		
		nt 001 Revision 00	

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)

ISFSI - Transfer Cask	Surface Finish Requirements Design Change 72.48 Log No.: SE00037						
D3-TG-5; 34/129;	ES199601368 Supplement 001 Revision 0000 Page 1 of 5						
Based on the attached discussion, does this activity:							
Applicable to 10 CFR 50.5	9 and 10 CFR 72.48 Safety Evaluations						
	Involve an unreviewed safety question (USQ)?						
	Involve a change in the Technical Specifications/License Conditions or Bases? Require a change or addition to the UFSAR/USAR?						
Applicable to 10 CFR 72.4	8 Safety Evaluations						
NO Involve a Significant Increase in Occupational Dose? NO Involve a Significant Unreviewed Environmental Impact?							
Prepared by: J. E. Remeniuk October Department: NED-CEU 42-01-04 Date: //- 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: Licensin							
SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE							
Approved	Disapproved Approved Disapproved						
Signature: Gm Markeld-Ton Nalastre de Signature: Muhall J. Gokum. INDEPENDENT REVIEWER LOT GS-DES, ES-TES, or PE-PDSU							
Date ////2/	197 Date MICHAEL J. GAHAWIII						
The POSRC has reviewed this evaluation according to NS-2-101.							
POSRC Meeting No.: 97-/34 Date: 11.24.97							
	ommend approval Date 1/-27-87 POSRC CHAIRMAN						
Approved Diss	approved Signature: PLANT GENERAL MANAGER Date 1/25/57						
The OSSRC has reviewed this evaluation according to NS-2-100.							
Signature: ORL	Moview required? Yes No X Movie Date: //30/98						
If yes, OSSRC Meeting No							

	sk Surface Finish Requirements Design Change 72.48 Log No.: SE00037	
D3-TC-5; 34/129;	ES199601368 Supplement 001 Revision 0000 Page 2 of 5	1

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.

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.

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.

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.

- 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)

ISFSI - Transfer Cask Botto	m 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, d	loes this activity:			
Applicable to 10 CFR 50.59 and 10	CFR 72.48 Safety Evaluations			
NO Involve	an unreviewed safety question (USQ)?			
	a change in the Technical Specifications/Licens	e Conditions or Bases?		
	a change or addition to the UFSAR/USAR?			
Applicable to 10 CFR 72.48 Safety	y Evaluations			
	a Significant Increase in Occupational Dose?			
NO Involve	a Significant Unreviewed Environmental Impac	rt?		
Prepared by: J. E. Remeniuk	Department: NED	D-CEU 42-01-04 Date: //- 7-97		
PRINTED NAME A	ND SIGNATÜRE	,		
YES Is a spec	cial review required by groups other than the gro	oup 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 / DATE	2 /// 11/10/97 // ZSIGNATURE / DATE	SIGNATURE / DATE		
Approved	Disapproved Approved	Disapproved		
Signature: In Whoodhel	Laton N. Wardfield Signature Mich	haily. Sahanan		
INDEPENDENT REV	TEWER Lo	AEL J. CAHAN III		
Date ///2/97	and the second s	11-13-97		
The POSRC has reviewed this eval	luation according to NS-2-101.			
POSRC Meeting No.: 97-	•	4.97		
Recommend Recommend				
Approval Disapproval		Date 11-27-97		
	POSRC CHAIR	MAN //		
Approved Disapproved	ISignature:	Date 1/21/57		
• ••	PLANT GENERA	L MANAGER		
The OSSRC has reviewed this eval	luation according to NS-2-100.			
Full OSSRC Committee regiew required? Yes No				
Signature: Signature: OSSRC SES CHAIR				
If yes, OSSRC Meeting No.:				

	Bottom Cover			
			72.48 Log No	
D3-TC-6;	ES19960			
			evision 0000 F	

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.

ISFSI - Transfer Cask Bottom Cove		No.: SE00038
D3-TC-6; 35/129; ES199	601368 Supplement 001 Revision 0000	

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.

ISFSI - Transfer Cask Bottom Cover P			
			No.: SE00038
D3-TC-6; 35/129; ES199601			
	368 Suppleme	ent 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?

<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.

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.

ISFSI - Transfer Cask Bottom Cover Plate Design Chang		
	ges 72.48 Log No.	
D3-TC-6; 35/129; ES199601368 Supplement		
D3-TC-6; 35/129; ES199601368 Supplemer		
	nt 001 Revision 0000 P	

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.

- 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)

ISFSI - Upper Trunn	iion 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 dis	scussion, 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. Remen	Department: <u>NED-CEU 42-01-04</u> Date: <u>//- 7- 97</u>		
PRINTE	ED NAME AND SIGNATURE		
YES	Is a special review required by groups other than the group to which the Preparer belongs?		
Resp. Ind.: G. Tesfay	Resp. Indv.: C. J. Dobry Resp. Indv.: R. H. Beall		
Work Group: Licensi			
Machendeleye 10 SIGNATURE / DATE	SIGNATURE/DATE SIGNATURE/DATE		
	DIGITAL VALUE VALU		
Approved	Disapproved Approved Disapproved		
Signature: Jan 11 Mindepen	Toras DES, OF PE POSU MICHAEL STES, OF PE POSU MICHAEL STES, OF PE POSU MICHAEL STES, OF PE POSU		
Date	2/97 Date 11-13-97		
The POSRC has reviewe	ed this evaluation according to NS-2-101.		
POSRC Meeting No.:	97-134 Date: 11-24-97		
Recommend Re	ecommend		
	isapproval Date 1/-24-87		
	POSRC CHAIRMAN		
Approved/ Di	isapproved Signature: Date #/25/57		
The OSSRC has reviewe	ed this evaluation according to NS-2-100.		
Full OSSRC Committee review required? Yes No			
Signature: OSSRC SI	Date: 1/30/98 ES CHAIRMAN		
If ves OSSRC Meeting	No ·		

	r Trunnion Attach		
			Log No.: SE00039
D3-TC-7; 36/			
			0 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.

ISFSI - Upper Trunnion Attachment	Design Change 72.48 Log No.	
D3-TC-7; 36/129; ES1996		
	01368 Supplement 001 Revision 0000 P	

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.

	nion Attachment Design Chang	e 72.48 Log No.: SE00039
D3-TC-7; 36/129;	ES199601368 Supp	element 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.

ISFSI - Upper Trunnion Attachment Design	gn Change 72.48 Log No.: SE00039
D3-TC-7; 36/129; ES19960136	8 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.

- 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)

ISFSI - Transfer Ca	isk Top Flange R	elief Holes Thread	ing	72.48 Log No.: SE00040
D3-TC-8; 37/129;	ES1996	01368 Supplem	ent 001 Revi	sion 0000 Page 1 of 5
	iconscion does this as	41-14		
Based on the attached di Applicable to 10 CFR 5		-		
NO NO		ewed safety question (U) in the Technical Specifi		ditions or Roses?
NO		or addition to the UFSA		ditions of Dases:
Applicable to 10 CFR 7	2.48 Safety Evaluation	<u>ons</u>		
NO		ant Increase in Occupat		
NO	Involve a Significa	ant Unreviewed Environ	nmental Impact?	
Prepared by: J. E. Reme PRINT	eniuk O	TURE De	partment: <u>NED-CEU</u>	J 42-01-04 Date: //- 7- 97
YES	Is a special review	required by groups oth	er than the group to	which the Preparer belongs?
Resp. Ind.: G. Tesfa		Resp. Indv.: C. J. Dob	У	Resp. Indv.: R. H. Beall
Work Group: Licen	sing	Work Group: PES		Work Group: NFM
SHALHIN Selam SIGNATURE / DATE	BJ 11/12/92	SIGNATURE / DATE /	10/47 M	HX SIGNATURE / DATE
Approved	Disappro		Approved	Disapproved
Signature: Independent of the second of the	ENGLICE TON CONTRACTOR	<i>N. Wood Field</i> Signa	ture. Muhar for CS	DESCENTES, OF PEPDSU
Date	197	Date		13-97
The POSRC has review	ved this evaluation acc	cording to NS-2-101.		
POSRC Meeting No.:_	97-134	Date:	11.24.	97
	Recommend	9_4		
ApprovalI	Disapproval	Signature: P	OSRC CHAIRMAN	Date <u>// -2 4 - 8 7</u>
Approved 1	Disapproved	_ Signature:	ANT GENERAL MA	NAGER Date 1/25/57
The OSSRC has review	wed this evaluation ac	cording to NS-2-100.		
Full OSSRC Committe	e réview required?	Yes No_	X	
Signature: OSSR	Linow SES CHAIRMAN	Date: _//30/	98	
If yes OSSRC Meeting	y No ·			

ISFSI - Transfer Cask Top Flange Relief Holes The		og No.: SE00040
D3-TC-8; 37/129; ES199601368 Supr		
	plement 001 Revision 000	

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.

ISFSI - Transfer Cask Top Flange Relief Holes Threading 72.48 Log No.:	
D3-TC-8; 37/129; ES199601368 Supplement 001 Revision 0000 Pa	
D3-TC-8; 37/129; ES199601368 Supplement 001 Revision 0000 Pa	

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 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?

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 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?

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 relief holes threading design change, there will be no increase in the accident dose consequences already described in the USAR.

ISFSI - Transfer Cask Top Flange Relief Holes Threading 72.48	Log No.: SE00040
D3-TC-8; 37/129; ES199601368 Supplement 001 Revision 00	

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.

ISFSI - Transfer Cask Top Flange Relief Holes Threadin	
	ig 72.48 Log No.: SE00040
D3-TC-8; 37/129; ES199601368 Supplement	nt 001 Revision 0000 Page 5 of 5
	nt 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.

- 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 Ca D3-TC-9; 38/129;	sk Shell Weld Process Design Change 72,48 Log No.: SE00041 ES199601368 Supplement 001 Revision 0000 Page 1 of 5					
Based on the attached di	Based on the attached discussion, does this activity:					
Applicable to 10 CFR 50	0.59 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	2.48 Safety Evaluations					
NO	Involve a Significant Increase in Occupational Dose?					
NO	Involve a Significant Unreviewed Environmental Impact?					
Prepared by: J. E. Reme	niuk Och Department: NED-CEU 42-01-04 Date: //- 7- 97					
PRINT	ED NAME AND SIGNATURE					
YES	Is a special review required by groups other than the group to which the Preparer belongs?					
Resp. Ind.: G. Tesfa						
Work Group: Licens	sing Work Group: PES Work Group: NFM					
Softwhen Jest of Signature / Date	"/10/97 UEN-10/97 UEN-10/97 SIGNATURE/DATE					
	Pi					
Approved	Disapproved Approved Disapproved					
Signature: INDEPE	NORTH REVIEWER Signature: Muhauf. Gahana Forces-DES GS-TES, or PE-PDSU					
Date	Date MICHAEL J. GAHAH III					
The POSRC has review	ed this evaluation according to NS-2-101.					
POSRC Meeting No.:_						
Recommend R	ecommend					
	Disapproval Date 11-24-97					
	POSRC CHAIRMAN					
Approved I	Disapproved Date <u>\(\lambda \) FLANT GENERAL MANAGER</u>					
The OSSRC has review	red this evaluation according to NS-2-100.					
Full OSSRC Committee	e review required? Yes NoX					
Signature: OSSRC S	Date: 1/30/98 ES CHAIRMAN					
If yes OSSRC Meeting	No ·					

ISFSI - Transfer Cask Shell Weld Process Design Change 72.48 Log No.: SE00041
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
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.

l - Transfer				72.48 Log No	
C-9; 38/129		19960136			
				sion 0000 P	

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.

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	
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.

ISFSI - Transfer Cask Shell Weld Process Design Change 72.48 Log No.:	
ISFSI - Transfer Cask Shell Weld Process Design Change 72.48 Log No.:	
D3-TC-9; 38/129; ES199601368 Supplement 001 Revision 0000 Pa	

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.

- 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)

ISFSI - Transfer Cask	Top Flange Location Hole Depth Design Change	72.48 Log No.; SE00042
D3-TC-10; 39/129;		
DS-10-10, 09/125,	23 13300 1300 Supplement out Revision	on 0000 Page 1 of 5
Based on the attached discus	•	
Applicable to 10 CFR 50.59	and 10 CFR 72.48 Safety Evaluations	
	nvolve an unreviewed safety question (USQ)?	
	nvolve a change in the Technical Specifications/License Conditi tequire a change or addition to the UFSAR/USAR?	ions or Bases?
Applicable to 10 CFR 72.48	Safety Evaluations	
	nvolve a Significant Increase in Occupational Dose?	
NO Ir	nvolve a Significant Unreviewed Environmental Impact?	
Prepared by: J. E. Remeniuk PRINTED N	Department: NED-CEU 42	2-01-04 Date: //- 7-97
	0	
YES Is	s a special review required by groups other than the group to wh	nich the Preparer belongs?
Resp. Ind.: G. Tesfaye	- · · · · · · · · · · · · · · · · · · ·	Resp. Indv.: R. H. Beall
Work Group: Licensing	Work Group: PES	Work Group: NFM
Entachero Listages "/	/1/97 /1/19/11 1/b	+ XIIII 11/11/97
SIGNATURE / DATE	SIGNATURE / DATE	SIGNATURE / DATE
Approved	Disapproved Approved	Disapproved
Signature: Jan 1/ Nova	feld Jon N. Wood Field Signature: Mechael	J. Sahana
INDEPENDE		CAHAN III
Date	Date 11-13-	-97
The POSRC has reviewed the	his evaluation according to NS-2-101.	
POSRC Meeting No.:	97-/34 Date: //-24-97	
Recommend Recor	mmend	
Approval Disap	pproval Signature: POSRC CHAIRMAN	Date <u>//-24-97</u>
Approved V Disar	pproved Signature:PLANT GENERAL MANA	Date <u>///2//5</u>
The OSSBC has reviewed 41		,
	his evaluation according to NS-2-100. view required? Yes No X	
and		
Signature: OSSRC SES	Date: 1/30/98 CHAIRMAN	
If yes, OSSRC Meeting No.	.:	

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.

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.

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? 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 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?

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 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?

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.

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.

- 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)

If yes, OSSRC Meeting No.:_____

	ATTACHMENT 3, SAFETY EVALUATION FORM
ISFSI - Deletion o	of TC Lead Casting Full Surface Requirement 72.48 Log No.: SE00043
D3-TC-12; 40/129	e; 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 NO	Involve an unreviewed safety question (USQ)? Involve a change in the Technical Specifications/License Conditions or Bases? Require a change or addition to the UFSAR/USAR?
Applicable to 10 CFR	2.72.48 Safety Evaluations
NO NO	Involve a Significant Increase in Occupational Dose? Involve a Significant Unreviewed Environmental Impact?
Prepared by: J. E. Repared by: J. E. Repared by: PRI	meniuk J C Department: NED-CEU 42-01-04 Date: 1/. 7. 97 NTED NAME AND SIGNATURE
YES	Is a special review required by groups other than the group to which the Preparer belongs?
Resp. Ind.: G. Te Work Group: Lic	
Setachen Jermy SIGNATURE / DA	TE SIGNATURE / DATE SIGNATURE / DATE
Approved	Disapproved Approved Disapproved
Signature: Inde	PROBLEM TON N. Woodsield Signature: Mikally. Sakana PREPOSENT REVIEWER FOR CS DES GS. TES, OF PE. PDSU MICHAEL J. GAHAN III Date 11-13-97
The POSRC has revi	ewed this evaluation according to NS-2-101.
	: 97-134 Date: 11.24.97
Recommend Approval	Recommend Disapproval Disapproval POSRC CHAIRMAN Date /1-24-97
Approved	Disapproved DateDate
The OSSRC has rev	iewed this evaluation according to NS-2-100.
Full OSSRC Commi	ttee review required? Yes NoX
Signature: OSSR	Date: 1/30/98

SI - Deletion of TC Lead Casting Full Surface Requirement	72.48 Log No.: SE00043
[C-12: 40/129: ES199601368 Supplement 001	
FC-12; 40/129; ES199601368 Supplement 001	Revision 0000 Page 2 of 5
rc-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.

ISFSI - Deletion of TC Lead Casting Full Surface Requirement 72.48 Log No.: SE00	
ISFSI - Deletion of TC Lead Casting Full Surface Requirement 72.48 Log No.: SE00	
D3-TC-12; 40/129; ES199601368 Supplement 001 Revision 0000 Page 3 of	
D3-TC-12; 40/129; ES199601368 Supplement 001 Revision 0000 Page 3 of	

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.

ISFSI - Deletion of TC Lead Casting Full S	
	urface Requirement 72.48 Log No.: SE00043
D3-TC-12; 40/129; ES199601368	
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.

ISFSI - Deletion of TC Lead Casting Full Surface Requirement 72.48 Log No.: SE	
D3-TC-12; 40/129; ES199601368 Supplement 001 Revision 0000 Page !	
D3-TC-12; 40/129; ES199601368 Supplement 001 Revision 0000 Page !	

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.

- 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)

ISFSI - Upper Neutr	ron Shield Panel Tolerance Design Change 72,48 Log No.: SE0	0044	
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D3-TC-13; 41/129;	ES199601368 Supplement 001 Revision 0000 Page 1	or 5	
Based on the attached di	iscussion, does this activity:		
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluations		
NO	Involve on annexious defets assertion (IICO)?		
NO NO	Involve an unreviewed safety question (USQ)? 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	2.48 Safety Evaluations		
NO	Involve a Significant Increase in Occupational Dose?		
NO	Involve a Significant Unreviewed Environmental Impact?		
Prepared by: J. E. Remer		<u> 27</u>	
PRINT	ED NAME AND SIGNATURE		
YES	Is a special review required by groups other than the group to which the Preparer belongs	?	
Resp. Ind.: G. Tesfay			
Work Group: Licens	sing Work Group: PES Work Group: NFM		
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SIGNATURE DATE	SIGNATURE / DATE SIGNATURE / DATE	<u>((</u> 7)	
SIGNATURE/ DATE	SIGNATURE/DATE		
Approved	Disapproved Disapproved		
I Walter !	Ton N. Wood Fight		
Signature:	Signature: Methally. Sakawa. NDENT REVIEWER Signature: Methally. Sakawa. For GS-DES GS-TES, or PE-PDSU		
	MICHAEL J. GAHAN III		
Date	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		
ApprovalD	Disapproval Date _//-2 POSRC_CHAIRMAN	9-27	
/	POSRC CHAIRMAN		
Approved D	Disapproved Date Date	1197	
•	PLANT GENERAL MANAGER / /	7 /	
The OSSRC has reviewed this evaluation according to NS-2-100.			
Full OSSRC Committee regiew required? Yes No			
Signature: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
OSSRE SES CHAIRMAN			
If wes OSSBC Meeting	z No ·		

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	
D3-TC-13; 41/129; ES199601368 Supplement 001 Revision 0000 Page 2 of 5	
D3-TC-13; 41/129; ES199601368 Supplement 001 Revision 0000 Page 2 of 5	
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D3-1C-13: 41/129: ES199601368 Supplement 001 Revision 0000 Page 2 of 5	
D3: C-13: 41/129: E51990U1306 Supplement UUT Revision UUU Page 2 of 5	
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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.

ISFSI - Upper Neutron Shield Pa			
			No.: SE00044
D3-TC-13; 41/129; ES1	99601368 Supp		
		lement 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.

ISFSI - Upper Neutron Shield Panel Tolerance De	sign Change 72.48 Log No.: SE00044
D3-TC-13; 41/129; ES199601368 Sup	
	plement 001 Revision 0000 Page 4 of 5
	plement 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.

ISFSI - Upper Neutron Shield Panel		
		72.48 Log No.: SE00044
D3-TC-13; 41/129; ES1996		
D3-TC-13; 41/129; ES1996	ment 001 Revis	ion 0000 Page 5 of 5
		ion 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.

- 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)

ISFSI - Transfer Cas	sk Top Cover F	Plate Material I	Design Change	72.4	8 Log No.: SE00045
D3-TC-14; 42/129;	ES199)601368 Su	pplement 001	Revision 0	000 Page 1 of 5
Based on the attached dis	scussion, does this	activity:			
Applicable to 10 CFR 50	·	•	tions		
NO	Involve an unrev	riewed safety quest	tion (USO)?		
NO		v .	Specifications/Licer	nse Conditions o	or Bases?
NO	Require a change	e or addition to the	UFSAR/USAR?		
Applicable to 10 CFR 72	.48 Safety Evalua	<u>tions</u>			
NO	Involve a Signifi	cant Increase in C	Occupational Dose?		
NO	Involve a Signifi	cant Unreviewed	Environmental Imp	act?	
Prepared by: J. E. Remen	niuk O. (ED NAME AND SIGN.	ATURE	Department: NE	ED-CEU 42-01-0	04 Date: //· 7· 97
YES	Is a special revie	w required by gro	ups other than the g	roup to which the	he Preparer belongs?
Resp. Ind.: G. Tesfay		Resp. Indv.: C.	•		Indv.: R. H. Beall
Work Group: Licensi	ing	Work Group: P	ES	Work	Group: NFM
Setachen Jedjanden SIGNATURE/DATE	11/2/97 _	SIGNATURE /	u/10/97 DATE	III SIG	<u> </u>
Approved	Disapp	proved	Approv		Disapproved
Signature: On INDEPEN	WENT REVIEWER	N. lebodrie la	Signature: Mic	hally >	Gahanan TES, or PE-PDSU
Date	197		Date	11-13-97	
The POSRC has reviewe	d this evaluation a	ccording to NS-2-	101,		
POSRC Meeting No.:	97-134	·	Date:	4.97	
Recommend Re	ecommend			2	
Approval	isapproval	Signature:	POSRC CHAI	RMAN	Date <u>//-24-87</u>
Approved Di	isapproved	Signature:	PLANT GENER) AL MANAGER	Date 1/21/4-7
The OSSRC has reviewe	d this evaluation a	according to NS-2-	-100.		
Full OSSRC Committee	review required?	Yes	NoX		
Signature: OSSRC SI	<i>DMONN</i> ES CHAIRMAN	Date:/	130/98		
If ves OSSRC Meeting 1	No ·				

	Fop Cover Plate Material Design Change 72.48 L	
		og No.: SE00045
D3-TC-14; 42/129;		
	ES199601368 Supplement 001 Revision 000	0 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.

		Material Design Chang		g No.: SE00045
D3-TC-14; 42/129;	ES199601		Revision 0000	
		368 Supplement 001		
				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.

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		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-1 C-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-1C-14; 42/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5		
D3-1C-14; 42/129; E5/1990/1368 Supplement OUT Revision OUOU Page 4 of 5		
D3-10-14, 42123, E3133001300 Suppliement out Revision boot Page 4 of 5		
DO-10-14, 42 122, C3 13300 1300 Supplement out Revision 0000 Fage 4 01 5		
DO 10-14, 420 1201 LO 10000 1000 Culphetter to 01 1/24/3/01/0000 Fage 4 01 3		
tall coperiors debalement of the training of the first of the coperiors		

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.

ISFSI - Transfer Cask Top Cover Plate Material Design Change 72.48 Log I	No.: SE00045
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000	
D3-TC-14; 42/129; ES199601368 Supplement 001 Revision 0000	
D3-TC-14; 42/129; 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 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)

ISFSI - Transfer Cask Alignment Mounting Holes 72:48 Log No.: SE00046				
D3-TC-15; 43/129; ES199601368 Supplement 001 Revision 0000 Page 1 of 8				
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: 1/- 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 / DATE SIGNATURE / DATE SIGNATURE / DATE	9			
Approved Disapproved Disapproved				
Signature: Jan M. Modeled Jan M. Mard Fred Signature: Muchael Jokana, INDEPENDENT REVIEWER JOGS DES, GS-TES, or PE-PDSU	_			
Date 11/12/97 Date MICHAEL J. GAHANIII				
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.: 97-/34 Date:				
Recommend Recommend				
Approval Disapproval Signature: Date Date	<u>-97</u> 			
Approved Disapproved Signature: Date	2_			
The OSSRC has reviewed this evaluation according to NS-2-100.				
Full OSSRC Committee review required? Yes No				
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN				
If ves OSSRC Meeting No				

ISFSI - Transfer Cask Alignment Mounting Holes	72.48 Log No.: SE00046
D3-TC-15; 43/129; ES199601368 Supplement 0	
D3-TC-15; 43/129; ES199601368 Supplement 0	
D3-TC-15; 43/129; ES199601368 Supplement 0	01 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.

ISFSI - Transfer Cask Alignment Mount	
	ing Holes 72.48 Log No.: SE00046
D3-TC-15; 43/129; ES1996013	68 Supplement 001 Revision 0000 Page 3 of 5
	68 Supplement 001 Revision 0000 Page 3 of 5

Complete for 50.59 and 72.48:

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.

X .

ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - Transfer Cask Alignment Mounting Holes 72.48 Log	No.: SE00046
ISCSI - I Idiisiei Cask Allulillein Muuliulig Rules 12.40 Luu	NU. SEUUUAU
	00.04.0000.0000.0000.000.000.0000.0000.000
D3-TC-15; 43/129; ES199601368 Supplement 001 Revision 0000	Page 4 of 5
ESTEROUS SUDDICTION REVISION OUT	Fauc 4.01

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.

	Mounting Holes 72.48 Log No.: SE00046
ISFSI - Transfer Cask Alignment	
D3-TC-15; 43/129; ES19	99601368 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)

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ISFSI - TC Top Plate Weld Surface Finish R	equirements Clarification 72.48 Log No.: SE00047
D3-TC-16; 44/129; ES199601368	Supplement 001 Revision 0000 Page 1 of 5
	Cappicinisticos: Abstalon Good Fage For 3
Based on the attached discussion, does this activity:	
Applicable to 10 CFR 50.59 and 10 CFR 72.48 Safety I	<u>Evaluations</u>
NO Involve an unreviewed safety	
NO Involve a change in the Tech NO Require a change or addition	nnical Specifications/License Conditions or Bases?
Require a change of addition	to the OFSAR/USAR/
Applicable to 10 CFR 72.48 Safety Evaluations	
NO Involve a Significant Increas	
NO Involve a Significant Unrevi	ewed Environmental Impact?
Prepared by: J. E. Remeniuk	Department: <u>NED-CEU 42-01-04</u> Date: //-7-97
PRINTED NAME AND SIGNATURE	
YES Is a special review required by	by groups other than the group to which the Preparer belongs?
	v.: C. J. Dobry Resp. Indv.: R. H. Beall
Work Group: Licensing Work Gro	oup: PES Work Group: NFM
SIGNATURE / DATE /SIGNATURE	PURE / DATE SIGNATURE / DATE
Approved Disapproved	Approved Disapproved
Signature: Independent Reviewer	signature: Michael & Lakana
// - // -	
Date	Date
The POSRC has reviewed this evaluation according to	NS-2-101.
POSRC Meeting No.: <u>97-/34</u>	Date:
Recommend Recommend	
Approval Sign	Date 11-27-57
/	PÓSRC CHAIRMAN
Approved/ Disapproved Sign	PLANT GENERAL MANAGER Date 1/2/67
	0
The OSSRC has reviewed this evaluation according to	NS-2-100.
Full OSSRC Committee review required? Yes	NoX
Signature: Da OSSRE SES CHAIRMAN	te: 1/30/98
If yes, OSSRC Meeting No.:	

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.

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:

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.

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:

- 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.

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.

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)

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ISFSI - Transfer Cask Shield Plug Material Design Cha	nge 72,48 Log No.: SE00048
D3-TC-17; 45/129; ES199601368 Supplement	ent 001 Revision 0000 Page 1 of 5
20-10-17 -07/207 Europoisto Guppletti	ent out Revision toot Fage 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 (US	O)2
NO Involve a change in the Technical Specific	
NO Require a change or addition to the UFSAI	
100 Require a change of addition to the Of SA	VODAK
Applicable to 10 CFR 72.48 Safety Evaluations	
NO Involve a Significant Increase in Occupation	onal Dose?
NO Involve a Significant Unreviewed Environ	
- 0	
Prepared by: J. E. Remeniuk Dept	artment: NED-CEU 42-01-04 Date: //- 7. 97
PRINTED NAME AND SIGNATURE	
YES Is a special review required by groups other	er than the group to which the Preparer belongs?
7	The state of the s
Resp. Ind.: G. Tesfaye Resp. Indv.: C. J. Dobry	•
Work Group: Licensing Work Group: PES	Work Group: NFM
He was a selection of the selection of t	MIND Dlank
Beladran derfayed 1/11/47 ////1/	10/97 (11/4 N. Yhall 11/11/9)
SIGNATURE / DATE SIGNATURE / DATE	SIGNATURE / DATE '
Approved Disapproved	Approved Disapproved
100000	, , , , , , , , , , , , , , , , , , , ,
Signature: Jon M. More Signature: John M. Market Signature: Independent Reviewer	ure: Michael J. Jakunan
/ INDEPENDENT REVIEWER	JONGS DESIGNATES, OF PE-PDSU MICHAEL J. CAAHANIII
Date Date	11-13-97
The POSRC has reviewed this evaluation according to NS-2-101.	
	11 0 4 0 67
POSRC Meeting No.: 97-/34 Date:	<u> //· 24 · 97</u>
Recommend Recommend	2
Approval Signature:	1 Call Date 11-24-97
PO	OSRC CHAIRMAN
Approved Disapproved Signature:	Date 11/5/57
	NT GENERAL MANAGER
	8
The OSSRC has reviewed this evaluation according to NS-2-100.	
Full OSSRC Committee review required? Yes No	<u>X</u>
Signature: Rhemony Date: 1/30/	G. S.
OSSRE SES CHAIRMAN	70
•	
If yes, OSSRC Meeting No.:	

		erial Design			
					o.: SE00048
3-17; 45/129	ES199601			Revision 0000	
			lement 001		
					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.

ISFSI - Transfer Cas			
			72.48 Log No.: SE00048
D3-TC-17; 45/129;	601368 Supp	lement 001 Revisi	on 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 (Fy = 36 ksi), A516 is a pressure vessel steel (Fy = 38 ksi), and A283 is a low tensile strength carbon steel (Fy = 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.

ISFSI - Transfer Cask Shield Plug Ma		
		2.48 Log No.: SE00048
D3-TC-17; 45/129; ES19960		
D3-TC-17; 45/129; ES19960°	368 Supplement 001 Revisio	
		n 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.



ISFSI - Transfer Cask Shield F		
		72.48 Log No.: SE00048
D3-TC-17; 45/129; E		
	S199601368 Supplement 001	Revision 0000 Page 5 of 5
	S199601368 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)

ISFSI - Transfer Cas D3-TC-18; 46/129;	sk Shield Plug Width Tolerance Design Change 72,48 Log No.: SE ES199601368 Supplement 001 Revision 0000 Page	E00049 1 of 5					
Based on the attached dis	scussion, does this activity:						
Applicable to 10 CFR 50	0.59 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	2.48 Safety Evaluations						
NO NO	Involve a Significant Increase in Occupational Dose? Involve a Significant Unreviewed Environmental Impact?						
Prepared by: J. E. Remer	niuk Department: NED-CEU 42-01-04 Date: //-	7-97					
YES	Is a special review required by groups other than the group to which the Preparer below	ıgs?					
Resp. Ind.; G. Tesfay Work Group: Licens		il ikm					
SIGNATURE / DATE	SIGNATURE / DATE SIGNATURE / DATE	<u>'((4</u> /					
Approved Signature: Independent Independen	Disapproved Disapproved						
The POSRC has reviewed	ed this evaluation according to NS-2-101.						
POSRC Meeting No.:	97-134 Date: 11.24.97						
Approval D	POSRC CHAIRMAN	-24-97 					
Approved/ D	Disapproved Date /// PLANT GENERAL MANAGER	21/57					
The OSSRC has reviewe	ed this evaluation according to NS-2-100.						
Full OSSRC Committee	review required? Yes NoX						
Signature: OSSRC S	emon Date: 1/30/98 ES CHAIRMAN						
If yes, OSSRC Meeting	No.:						

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.

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.

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.

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)

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 at 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 C. Department: NED-CEU 42-01-04 Date: //- 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 / DATE SIGNATURE / DATE SIGNATURE / DATE						
Approved Disapproved Disapproved						
Signature: In M. Klaude Signature: Milal Signature: Milal Salaway INDEPENDENT REVIEWER LONGS DES CESTES, or PE-PDSU						
Date 11/12/97 Date 11-13-97						
The POSRC has reviewed this evaluation according to NS-2-101.						
POSRC Meeting No.: 97-/35 Date: //-26-97						
Recommend Recommend						
Approval Disapproval Date //-26-87						
Approved Disapproved Signature: PLANT GENERAL MANAGER POŚRC CHAIRMAN Date 11/1/57						
The OSSRC has reviewed this evaluation according to NS-2-100.						
Full OSSRC Committee review required? Yes No						
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN						
If yes, OSSRC Meeting No.:						

		on Conformance 72.48 Log No.: SE00050
4-TC-1; 47/129		
		lement 001 Revision 0000 Page 2 of 5
		lement 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.

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.

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:

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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.

ISFSI - Transfer Cask Minimum Shell Thickness Non Conformance 72.48 Log N	
	o.: SE00050
D4-TC-1; 47/129; ES199601368 Supplement 001 Revision 0000	
D4-TC-1; 47/129; ES199601368 Supplement 001 Revision 0000	
D4-TC-1; 47/129; ES199601368 Supplement 001 Revision 0000	

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)

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 Department: NED-CEU 42-01-04 Date: 1/- 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 / DATE SIGNATURE / DATE SIGNATURE / DATE						
Approved Disapproved Disapproved						
Signature: Jon II Novelfield Jon N. Wood Field Signature: Mulauly, Sahawan INDEPENDENT REVIEWER MICHAEL J. GRAHAP 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 Recommend						
Approval Disapproval Signature: Date //- 24-97 POSRC CHAIRMAN						
Approved Disapproved Signature: Date Date						
The OSSRC has reviewed this evaluation according to NS-2-100.						
Full OSSRC Committee review required? Yes No						
Signature: Date: 1/30/98 OSSRE SES CHAIRMAN						
If yes OSSRC Meeting No						

ISFSI - TC Shell Maximum Lead			
			No.: SE00051
D4-TC-2; 48/129; ES1	99601368 Su		
		01 Revision 0000	

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.

	imum Lead 🗅			
				No.: SE00051
D4-TC-2;				
				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.

ISFSI - TC Shell Maximum Lead Thickness Non Conformance 72.48 Log No.: SE00	
ISFSI - TC Shell Maximum Lead Thickness Non Conformance 72.48 Log No.: SE00	
D4-TC-2: 48/129: ES199601368 Supplement 001 Revision 0000 Page 4 (
D4-TC-2; 48/129; ES199601368 Supplement 001 Revision 0000 Page 4 (

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 N	lo.: SE00051
D4-TC-2; 48/129; ES199601368 Supplement 001 Revision 0000	
D4-TC-2; 48/129; 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) 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)

ISFSI - TC Top Flange	Maximum Bore Diameter I	Non Conformance	72.48 Log No.: SE00052	
D4-TC-3; 49/129;	ES199601368 Sup	pplement 001 Revis	ion 0000 Page 1 of 5	
Based on the attached discus	sion, does this activity:			
Applicable to 10 CFR 50.59	and 10 CFR 72.48 Safety Evaluat	<u>ions</u>		
NO In	avolve an unreviewed safety questi avolve a change in the Technical S equire a change or addition to the	Specifications/License Cond	itions or Bases?	
Applicable to 10 CFR 72.48 Safety Evaluations				
NO In	avolve a Significant Increase in Odnvolve a Significant Unreviewed E	invironmental Impact?	42-01-04 Date: <u>//- 7 - 9 7</u>	
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 Work Group: PI	u/10/97 /	Resp. Indv.: R. H. Beall Work Group: NFM	
Approved	Disapproved	Approved	Disapproved	
Signature: Independent Reviewer Signature: Michael				
Date ////2/	197		3-97	
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.: 97-/35 Date: 11-26-97				
	mmend pproval Signature:	POSRC CHAIRMAN	Date/-24-97	
Approved Disap	oproved Signature:	PLANT GENERAL MAN	Date h/1/57	
The OSSRC has reviewed this evaluation according to NS-2-100.				
Signature: Date: 1/30/95				
If yes OSSRC Meeting No.				

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 - 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

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.

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 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) 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)

		Preheat Non Confo		72.48 Log No.: SE			
D4-TC-4; 50/129;	E219	9601368 Supplei	ment 001 Rev	rision 0000 Page	1 of 5		
Based on the attached of	liscussion, does this	s activity:					
Applicable to 10 CFR 5	50.59 and 10 CFR 7	2.48 Safety Evaluations					
NO	Involve on unre	viewed safety question (U	ICO)9				
NO		e in the Technical Specif		nditions or Bases?			
NO		ge or addition to the UFS.		lations of Dascs:			
Applicable to 10 CFR 7	72.48 Safety Evalua	ations .					
NO	Involve a Signif	ficant Increase in Occupa	tional Dose?				
NO		ficant Unreviewed Enviro					
D 11 7 7 7	0-/	1 Q _			707		
Prepared by: J. E. Rem	ED NAME AND SIGN	VATURE De	epartment: NED-CE	U 42-01-04 Date: //-	1.7/		
# AT\$211		WI ORD					
YES	Is a special revi	ew required by groups of	her than the group to	which the Preparer below	ngs?		
Resp. Ind.: G. Tesf	aye	Resp. Indv.; C. J. Dol	ory	Resp. Indv.: R. H. Bea	all		
Work Group: Licer	nsing	Work Group: PES		Work Group: NFM	_		
IT	2		, ,	MM21011	11/1/10		
Allathen July ay 12	w/20/97	1///////////	10/97	NOT N. KUI	<u> [[[]</u> 4]		
SIGNATURE / DATI	E	SIGNATURE / DATE	<u> </u>	SIGNATURE / DATE	•		
Approved	Disap	proved	Approved	Disapproved			
Signature: Son 1/2	melleld I	En N. Wwo tield Sign	ature: Michae	I & Salary	9		
INDEP	ENDENT REVIEWER	277111111111111111111111111111111111111	Jor Cs	DES GS-TES, or PE-PDSU			
Date	12/97	Date	MICHAE 11-	LJ.GAHANII			
The POSRC has review	ved this evaluation	according to NS-2-101.					
POSRC Meeting No.:_	97-/35	Date	: <u>//·26 ·</u>	97			
Recommend	Recommend		0 -				
	Disapproval	Signature:	611	Date //-	-24-97		
			OSRC, CHAIRMAN				
Approved V Disapproved Signature: PLANT GENERAL MANAGER Date 12/1/27							
		1.	CALL OF SELECTE IN	ANAGER			
The OSSRC has review	wed this evaluation	according to NS-2-100.	•				
Full OSSRC Committee	ee review required?	Yes No_	<u>X</u>				
Signature: OSSRC	SES CHAIRMAN	Date: //30/	198				
If ves OSSRC Meetin	g No ·						

ISFSI - Transfer Cask Lead Pour Preheat Non Conformance 72.48 Log No.: SE000	
D4-TC-4; 50/129; ES199601368 Supplement 001 Revision 0000 Page 2 of	
D4-TC-4; 50/129; ES199601368 Supplement 001 Revision 0000 Page 2 of	

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 - Transfer Cask Lead Pour Preheat N	
	Non Conformance 72.48 Log No.: SE00053
	Supplement 001 Revision 0000 Page 3 of 5
D4-TC-4; 50/129; ES199601368	

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.

ISFSI - Transfer Cask Lead Pour Preheat Non Conformance 72.48 Log No.: SE0	
D4-TC-4; 50/129; ES199601368 Supplement 001 Revision 0000 Page 4	

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.

ISFSI - Transfer Cask Lead Pour Preheat Non Conformance 72.48 Log No).: SE00053
D4-TC-4; 50/129; ES199601368 Supplement 001 Revision 0000 I	
D4-TC-4; 50/129; ES199601368 Supplement 001 Revision 0000 I	

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)

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 Department: NED-CEU 42-01-04 Date: //· 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
Metachendersage 6 1/1/97 SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE
Approved Disapproved Disapproved
Signature: In Il Northeld Signature: Michael Signat
Date 11/12/97 Date 11-13-97
The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 97-/35 Date: 11.26-97
Recommend Recommend
Approval Disapproval Signature: POSRC CHAIRMAN Date //- 24 - 97
Approved Disapproved Signature: Date
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes No
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN
If ves. OSSRC Meeting No.:

ISFSI - Transfer Cask Lead Silver Conten	
	t Non Conformance 72.48 Log No.: SE00054
D4-TC-5; 51/129; ES199601368	Supplement 001 Revision 0000 Page 2 of 5
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

			Conformance		
					lo.: SE00054
D4-TC-5; 5		9601368 Si		Revision 0000	

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.

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ATTACHMENT 3, SAFETY EVALUATION FORM

	Silver Content Non Conformance	
		72.48 Log No.: SE00054
D4-TC-5; 51/129;	ES199601368 Supplement 001	
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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.

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)4-TC-5: 5		601368				

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)

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 Department: NED-CEU 42-01-04 Date: 1/- 7- 9 7 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 Resp. Indv.: R. H. Beall Work Group: NFM Work Group: All IIIII SIGNATURE DATE Resp. Indv.: R. H. Beall Work Group: NFM SIGNATURE DATE
Approved Disapproved Signature: Approved Disapproved Signature: Michael Signature: Mich
Recommend Approval Signature: Date //-24-57 POSRC CHAIRMAN Approved Disapproved Signature: Date //-37
The OSSRC has reviewed this evaluation according to NS-2-100. Full OSSRC Committee review required? Yes No

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				og No.: SE00055
D4-TC-6;				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 - TC Shell O.D. Maximum Temperature Non Conformance 72.48 Log No.: SE00	
ISFSI - TC Shell O.D. Maximum Temperature Non Conformance 72.48 Log No.: SE00	
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D4-TC-6; 52/129; ES199601368 Supplement 001 Revision 0000 Page 3 of	

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	<u>°F</u>	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.

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.

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ISFSI - TC Shell O.D. Maximum Temperature Non Conformance 72.48 Log No.: SE00055
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D4-TC-6; 52/129; ES199601368 Supplement 001 Revision 0000 Page 5 of 5
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)

ISFSI - TC Inner Lin	ner I.D. Maximum Temperature Non Conformance 72.48 Log No.: S	E00056	
D4-TC-7; 53/129;	ES199601368 Supplement 001 Revision 0000 Pag	e 1 of 5	
Based on the attached dis	liscussion, does this activity:		
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluations		
NO NO	Involve an unreviewed safety question (USQ)? Involve a change in the Technical Specifications/License Conditions or Bases? Require a change or addition to the UFSAR/USAR?		
Applicable to 10 CFR 72	2.48 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: 1/- 7-97			
YES	Is a special review required by groups other than the group to which the Preparer bel	ongs?	
Resp. Ind.: G. Tesfay Work Group: Licens		eall	
SIGNATURE / DATE	SIGNATURE / DATE SIGNATURE / DATE	E	
Approved	Disapproved Approved Disapproved	l	
Signature Joy // North	Signature. Muhaul J. Sahawa WI CHAEL J. GAHAN III		
Date///_	Date 11-13-97	_	
	ved this evaluation according to NS-2-101.		
POSRC Meeting No.:	97-135 Date: 11.26.97	_	
Recommend Approval Signature: Date //- 24 - 57			
Approved Disapproved Signature: Date			
The OSSRC has reviewed this evaluation according to NS-2-100.			
Signature: M	Date: 1/30/98		
If yes, OSSRC Meeting	g No.:		

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 - TC Inner Liner I.D. Maximu		
		e 72.48 Log No.: SE00056
D4-TC-7; 53/129; ES199	9601368 Suppler	
		evision 0000 Page 3 of 5
		evision 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 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	<u>°F</u>	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.

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.

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)

ICECL Taxas Cod Minimum Land This line 21 - Cod 70 40 Land Land Cod
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 an unreviewed safety question (05Q)? 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: 1/- 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
Setachen Jack "/n/97 SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE
Approved Disapproved Disapproved
Signature: On Morskell - Ton N. Labor Field Signature: Michael J. Sakaran Joy GS-DES GS-TES, or PE-PDSU
MICHAEL J. CTAHAN 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 Recommend
Approval Disapproval Date _//- 24-57
POSRC CHAIRMAN
Approved Disapproved Signature: PLANT CENERAL MANAGER Date 17/1/57
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes No
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN Date: 1/30/98
If yes, OSSRC Meeting No.:

ISFSI - Transfer Cask Minimum Lead Thickness Non Conformance 72.4	
	18 Log No.: SE00057
D4-TC-8; 54/129; ES199601368 Supplement 001 Revision 0	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 - 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.

ISFSI - Transfer Cask Minimum Lead Thickness Non Conformance 72.48 Log No.: SE00057

D4-TC-8; 54/129; 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 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.

ISFSI - Transfer Cask Minimum Lead Thickness Non C	
	onformance 72.48 Log No.: SE00057
D4-TC-8; 54/129; ES199601368 Suppleme	ent 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)

ISFSI - Upper Trunr	nion 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 di	scussion, does this activity:		
Applicable to 10 CFR 50	2.59 and 10 CFR 72.48 Safety Evaluations		
NO	Involve an unreviewed safety question (USQ)?		
NO NO	Involve a change in the Technical Specifications/License Conditions or Bases? Require a change or addition to the UFSAR/USAR?		
Applicable to 10 CFR 72			
NO	Involve a Significant Increase in Occupational Dose?		
NO	Involve a Significant Unreviewed Environmental Impact?		
Prepared by: J. E. Remei	Department: <u>NED-CEU 42-01-04</u> Date: <u>//· 7· 97</u>		
YES	Is a special review required by groups other than the group to which the Preparer belongs?		
Resp. Ind.: G. Tesfay Work Group: Licens			
Work Group. Electis	work Group. TES Work Group. NAM		
SIGNATURE / DATE	Vulled Signature / Date / Signature / Date / Signature / Date		
Approved	Disapproved Approved Disapproved		
Signature: Jouli Non	effeld-Ton V liko dried Signature: Michael J. Lahane		
- 11/	MICHAEL GAHANJIL		
Date	Date 11-13-97		
The POSRC has reviewed	ed this evaluation according to NS-2-101.		
POSRC Meeting No.:	97-/35 Date:		
	ecommend		
Approval D	isapproval Date //-2(-17) POSRC CHAIRMAN		
ApprovedD	isapproved Signature: PLANT CENERAL MANAGER Date 17//57		
The OSSRC has reviewed this evaluation according to NS-2-100.			
Full OSSRC Committee review required? Yes NoX			
Signature: Date: 1/30/98 OSSER SES CHAIRMAN			
If yes OSSRC Meeting	No ·		

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 - 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:

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.

S.I. =
$$(4.7/2) + [(4.7/2)^2 + (3.3)^2]^{1/2} = 6.4$$
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.

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.

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)

ISESL - Bottom Neutron Shield C	Sover Tolerance Non Conforman	72 48 Log No : SE00050
	99601368 Supplement 001	ce 72.48 Log No.: SE00059 Revision 0000 Page 1 of 5
Based on the attached discussion, does the	his activity:	
Applicable to 10 CFR 50,59 and 10 CFR	2 72.48 Safety Evaluations	
NO Involve an un	reviewed safety question (USQ)?	
NO Involve a char	nge in the Technical Specifications/Licens	e Conditions or Bases?
NO Require a char	nge or addition to the UFSAR/USAR?	
Applicable to 10 CFR 72.48 Safety Eval	luations	
NO Involve a Sign	nificant Increase in Occupational Dose?	
NO Involve a Sign	nificant Unreviewed Environmental Impac	et?
Prepared by: J. E. Remeniuk O. Co. PRINTED NAME AND SIG	Department: NEI	D-CEU 42-01-04 Date: //· 7-97
YES Is a special re	view required by groups other than the gro	oup 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
Stathen Sway 11/1/97 SIGNATURE / DATE	SIGNATURE / DATE	SIGNATURE / DATE
Approved Dis	approved Approved	Disapproved
Signature: In Il Jones Level 10 INDEPENDENT REVIEWE	IN Mbodsield Signature: Mic	CGS-DES/GS-TES, or PE-PDSU
Date		11-13-97
The POSRC has reviewed this evaluation	n according to NS-2-101.	
POSRC Meeting No.: 97-/3	3.5 Date: //- 2	26.97
Recommend Recommend	Ol	
Approval Disapproval	Signature: POSRC CHAIR	Date //-24-57
Approved Disapproved	Signature:	L MANAGER Date 12/1/57
The OSSRC has reviewed this evaluation according to NS-2-100.		
Full OSSRC Committee review required? YesNoX		
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN		
If yes, OSSRC Meeting No.		

ISFSI - Bottom Neutron Shield Cov		
		Log No.: SE00059
D4-TC-10; 56/129; ES1996		
	601368 Supplement 001 Revision 000	
		00 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 - 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.

ISFSI - Bottom Neutron Shield C			
			Log No.: SE00059
D4-TC-10; 56/129; ES19			
	99601368 Supplem	ent 001 Revision 00	
			00 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.

ISFSI - Bottom Neutron Shield Cover Tolerance Non Conformance 72.48 Log No.: SE	
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)

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 Department: NED-CEU 42-01-04 Date: //· 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
Mashen Johnson 1/2/97 July 11/10/97 JAN HULLIUMY? SIGNATURE DATE SIGNATURE DATE SIGNATURE DATE
Approved Disapproved Approved Disapproved
Signature: Jon Whoolfield Signature: Michael Jaham Jor CS-DES GS-TES, or PE-PDSU
Date
The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 97-/35 Date: //-26-97
Recommend Recommend
Approval Disapproval Signature: Date //-21-27
Approved Disapproved Signature: Date
PLANT CENERAL MANAGER
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee regiew required? Yes No
Signature: Date: , /30/98 OSSNE SES CHAIRMAN
If ves OSSRC Meeting No:

ISFSI - Lower Trunnion Plug D		
		72.48 Log No.; SE00060
D4-TC-11; 57/129; ES		
	199601368 Supplement 001	
		Revision 0000 Page 2 of 5
		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.

ISFSI - Lower Trunnion Plug Diameter Non Conformance 72.48	
	Log No.: SE00060
D4-TC-11; 57/129; ES199601368 Supplement 001 Revision 000	
D4-TC-11; 57/129; ES199601368 Supplement 001 Revision 000	
	00 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.

ISFSI - Lower Trunnion Plug Dia			g No.: SE00060
D4-TG-11; 57/129; ES1	99601368 Suppleme		
		nt 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.

ISFSI - Lower Trunnion Plug Diameter Non Conformance 72.48 Log No.: SEC	
D4-TC-11; 57/129; ES199601368 Supplement 001 Revision 0000 Page 5	
D4-TC-11; 57/129; ES199601368 Supplement 001 Revision 0000 Page 5	
D4-TC-11; 57/129; ES199601368 Supplement 001 Revision 0000 Page 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)

ISFSI - Optical Plug Alignment Target Hole Oversize Non Conformance 72:48 Log No.: SE0006 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 Department: NED-CEU 42-01-04 Date: 17-97 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 / DATE SIGNATURE / DATE SIGNATURE / DATE				
Approved Disapproved Disapproved Signature: Interpreted Ton N Wood Sield Signature: Michael J. Sakaran INDEPENDENT REVIEWER				
INDEPENDENT REVIEWER JONGS-DES, CS-TES, or PE-PDSU MICHAEL J. CTAHAW AU Date Date 11-13-97				
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.: 97-/35 Date: 11.26-97				
Recommend Recommend				
Approval Disapproval Signature: Date //-26-97				
Approved Disapproved Signature: PLANT GENERAL MANAGER Date				
The OSSRC has reviewed this evaluation according to NS-2-100.				
Full OSSRC Committee regiew required? Yes No				
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN				
If yes, OSSRC Meeting No.:				

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.

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.

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 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 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.

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)

ISFSI - Transfer Ca	ask Nitronic Rail Minimur ES199601368	m Width Non Confo Supplement 001	rmance 72.4 Revision 0	
	liscussion, does this activity:	Paralmatia		
Applicable to 10 CFR 3	50.59 and 10 CFR 72.48 Safety	<u>Evaluations</u>		
NO NO NO	Involve an unreviewed safet Involve a change in the Tec Require a change or addition	hnical Specifications/Lic	ense Conditions of	or Bases?
Applicable to 10 CFR	72.48 Safety Evaluations			
NO NO	Involve a Significant Increa	iewed Environmental Im	pact?	
Prepared by: J. E. Rem	ENIUK OF CONTROL OF THE PROPERTY OF THE PROPER	Department: 1	NED-CEU 42-01-	04 Date: //- 7-97
YES	Is a special review required	by groups other than the	group to which t	he Preparer belongs?
Resp. Ind.: G. Tesf Work Group: Licer	•	iv.: C. J. Dobry oup: PES		. Indv.: R. H. Beall c Group: NFM
Selashan Maga SIGNATURE / DATE	6 u/n/97 /SIGNA	///10/97 TURE/DATE	At si	BALLI/4/9) GNATURE / DATE
Approved Signature Apple	Disapproved	Appro	ichael I.	Disapproved Sakaran
Date	BADENT REVIEWER		FOR GS-DES GS- CHAEL J.C.	
	772777		1. 15	
	wed this evaluation according to			
POSRC Meeting No.:	97-135	Date://	1.26.97	· · · · · · · · · · · · · · · · · · ·
	Recommend Disapproval Sign	nature: Posrc CH	AIRMAN	Date <u>1/-24-97</u>
Approved	Disapproved Sig	nature: PLANT GEN	FRAL MANAGER	Date 17/1/57
The OSSRC has revie	wed this evaluation according to	NS-2-100.		
Full OSSRC Committee	ee review required? Yes	NoX_		
Signature: OSSRC	SES CHAIRMAN DE	ate: 1/30/93		
If yes, OSSRC Meetin	g No.:			•

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.

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.

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.

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)

ISFSI - TC Alignmei	nt Target Hole Oversize	Non Conformance	72.48	Log No.: SE00063
D4-TC-14; 60/129;	ES199601368	Supplement 001		000 Page 1 of 5
Based on the attached di	scussion, does this activity:			
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety	Evaluations		
NO NO	Involve an unreviewed safet Involve a change in the Tech Require a change or addition	hnical Specifications/Lic		Bases?
Applicable to 10 CFR 72	2.48 Safety Evaluations			
NO NO	Involve a Significant Increa Involve a Significant Unrev			
Prepared by: J. E. Reme PRINT	niuk CCCCE ED NAME AND SIGNATURE	Department:	NED-CEU 42-01-0	4 Date: //- 7-97
YES	Is a special review required	by groups other than the	e group to which th	e Preparer belongs?
Resp. Ind.: G. Tesfa Work Group: Licens	work Gi	dv.: C. J. Dobry roup: PES	Work	Indv.: R. H. Beall Group: NFM NATURE / DATE
Approved Signature: INDEPE	Disapproved Official Ton N. Wood NOONT REVIEWER 102 / 9 7	Appr Signature: M.	charly of	Disapproved Saluran ES, or PE-PDSU A 1+ A ~ JII
The POSRC has review	ed this evaluation according to	NS-2-101		
POSRC Meeting No.:	_		1.26-97	
Approval I		nature: POSRC CH	AIRMAN ERAL MANAGER	Date 11-26-87 Date 14/57
The OSSRC has review	ed this evaluation according to	o NS-2-100.	/	
Full OSSRC Committee Signature: OSSRC S		No X ate: 1/30/98		0
If yes, OSSRC Meeting	; No.:			

	: Alignment Target			72.48 Log No.: S	
D4-TC-14		S199601368	001 Revision		
					e 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.

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.

				og No.: SE00063
		e Non Conforma		
			001 Revision 0000	
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D4-TC-14;		3 Supplement		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.

ISFSI - TC Alignment Target Hole Oversize Non Conformance 72.48 Log No.: SE00063	
ISFSI - TC Alignment Target Hole Oversize Non Conformance 72.48 Log No.: SE00063	
ISFSI - TC Alignment Target Hole Oversize Non Conformance 72.48 Log No.: SE00063	
ISFSI - TC Alignment Target Hole Oversize Non Conformance 72.48 Log No.: SE00063	
ISFSI - TC Alignment Target Hole Oversize Non Conformance 72.48 Log No.: SE00063	
ISES - I C Alignment Target Hole Oversize Non Conformance /2.48 Log No.: SEUUUG3	
ISES = I CAUGNMENT Arget Hole: Oversize Non Sontoffiance //462 = 00 No (SEUU)	
D4-TC-14: 60/129: ES199601368 Supplement 001 Revision 0000 Page 5 of 5	
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)

ISFSI - TC Bottom (D-Ring Groove Maximum Depth Non Conformance 72.48 Log No.: SE00064 ES199601368 Supplement 001 Revision 0000 Page 1 of 5								
	scussion, does this activity:								
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluations								
NO	NO Involve an unreviewed safety question (USQ)? NO Involve a change in the Technical Specifications/License Conditions or Bases?								
NO	·								
Applicable to 10 CFR 72	2.48 Safety Evaluations								
NO NO	1								
Prepared by: J. E. Reme PRINT	Prepared by: J. E. Remeniuk C. L. Department: NED-CEU 42-01-04 Date: 11.7-97 PRINTED NAME AND SIGNATURE								
YES	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 / DATE	SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE								
Approved	Disapproved Approved Disapproved								
Signature: Jan II Northell Ton N boulfield Signature: Michael J. Gaharan For CS-DES, CS-TES, or PE-PDSU MICHAEL J. GAHAN III.									
Date	1/12/97 Date 11-13-97								
The POSRC has reviewed this evaluation according to NS-2-101.									
POSRC Meeting No.: 97-/35 Date: 11.26.97									
	Date 11-24-57 POSRC CHAIRMAN								
Approved	Disapproved Date 17/1/57 Date 17/1/57								
The OSSRC has review	red this evaluation according to NS-2-100.								
Full OSSRC Committee	e review required? Yes NoX								
Signature: OSSE	Date: 1/30/98 SES CHAIRMAN								
If yes, OSSRC Meeting	No.:								

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 Oring 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.

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.

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 Oring groove of 0.183" was exceeded. The maximum measured depth is 0.185". The Oring 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 Orings are Parker Orings 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 Oring, 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.

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 Oring 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)

linear ways a	E								
ISFSI - IC 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 NO	Involve a change in the Technical Specifications/License Conditions or Bases? Require a change or addition to the UFSAR/USAR?								
110 Todano a similo se mannon to mo or periodos.									
Applicable to 10 CFR	72.48 Safety Evaluations								
NO	Involve a Significant Increase in Occupational Dose?								
NO	Involve a Significant Unreviewed Environmental Impact?								
	0110								
Prepared by: J. E. Rem	Department: NED-CEU 42-01-04 Date: //- 7-97								
TKII									
YES	Is a special review required by groups other than the group to which the Preparer belongs?								
Resp. Ind.: G. Tes	sfaye Resp. Indv.: C. J. Dobry Resp. Indv.: R. H. Beall								
Work Group: Lice									
	all Minimulation								
Satache Sestaul b	8 11/2/97 MXX/1/20197 MXX/1/2011/11/97								
SIGNATURE / DAT	TE SIGNATURE / DATE SIGNATURE / DATE								
Approved	Disapproved Approved Disapproved								
Approved									
Signature	modfield Jon N. What rold Signature. Muharl J. Saharan								
INDE	PENDENT REVIEWER FOR GS-DES, CS-TES, or PE-PDSU MICHAEL CAHAN III								
Date	1/12/97 Date 11-13-97								
The DOSDC has revise	ewed this evaluation according to NS-2-101.								
	the state of the s								
POSRC Meeting No.:	: 97-135 Date: 11.26.97								
Recommend	Recommend								
Approval	Disapproval Date 11-24-97								
	POSRC CHAIRMAN								
Approved	Disapproved Signature: Date 12/1/5)								
	PLANT GENERAL MANAGER								
The OSSRC has revie	iewed this evaluation according to NS-2-100.								
	ttee review required? Yes No								
ruii OSSKC Commit	tice review required? Tes 140								
Signature:	Telmon Date: 1/30/98								
/ ossko	É SES CHAIRMAN								
If ves. OSSRC Meeti	ing No.:								
11) 00, 000110 1.11011.									

ISFSI - TC Bottom Forging Minimum Diameter Non Conformance 72.48 Log No.: SE00	
D4-TC-16; 62/129; ES199601368 Supplement 001 Revision 0000 Page 2 of	
D4-TC-16; 62/129; ES199601368 Supplement 001 Revision 0000 Page 2 of	

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.

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.

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.

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)

ISFSI - Lifting Yoke				2.48 Log No.: SE00069				
A-LY-11; 66/129;	ES199601368	Supplemen	t 001 Revisio	n 0000 Page 1 of 5				
Based on the attached di	iscussion, does this activity:			•				
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety	<u>Evaluations</u>						
NO	Involve an unreviewed safe	ety question (USQ)	?					
NO	ons or Bases?							
NO Require a change or addition to the UFSAR/USAR?								
Applicable to 10 CFR 7	2.48 Safety Evaluations							
NO	Involve a Significant Incre							
NO	Involve a Significant Unre	viewed Environme	ental Impact?					
Prepared by: J. E. Reme PRINT	eniuk OCC ED NAME AND SIGNATURE	Depart	ment: <u>NED-CEU 42</u>	-01-04 Date: //· 7-97				
YES	Is a special review require	d by groups other t	han the group to wh	ich the Preparer belongs?				
Resp. Ind.: G. Tesfa		ndv.: C. J. Dobry		Resp. Indv.: R. H. Beall				
Work Group: Licen	sing Work (Group: PES	\ \alpha	Work Group: NFM				
Lotachew Scolary X SIGNATURE / DATE	Sign	21/10/ ATURE/DATE	47 11	Signature / date				
Approved	Disapproved		(Approved)	Disapproved				
Signature: // ha	Lan m. A. CAR	Signature	e: Muhail	h Sakanen				
	ENDENT REVIEWER		MICHAELJ					
Date ///2/	97	Date	11-13	<u>-97</u>				
The POSRC has review	ved this evaluation according	to NS-2-101.						
POSRC Meeting No.:_	97-135	Date:	11-26-9	7				
Recommend /I	Recommend							
		gnature:	, Call	Date 11-24-97				
		POSI	RC CHAIRMAN	11				
Approved 1	Disapproved Si	gnature: PLAN	T GENERAL MANA	GER Date 1/57				
The OSSRC has review	ved this evaluation according	to NS-2-100.	O					
Full OSSRC Committe	ee eeview required? Yes	No_X	<u> </u>					
Signature: OSSRC	- Emory 1 SES CHAIRMAN	Date: <u>//30/9</u>	8					
If yes, OSSRC Meeting	g No.:							

ISFSI - Lifting Yoke Classification	72.48 Log No.: SE00069
A-LY-11: 66/129: ES19	
	9601368 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.

						SE00069	
SI - Lifting '							
Y-11; 66/12						je 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 voke 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.

FSI - Lifting Yoke Class			48 Log No.: SE00069
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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 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?

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 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.

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 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?

A significant unreviewed environmental impact:

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.

ISFSI - Lifting Yoke Classification 7	2.48 Log No.: SE00069
A-LY-11; 66/129; ES199601368 Supplement 001 Revision	n 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

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ISFSI - Deletion of I					lo.: SE00070				
D3-LY-1; 67/129;	ES199601	368 Supplem	ent on 1 Keal	sion 0000	Page 1 of 5				
Based on the attached di	Based on the attached discussion, does this activity:								
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 S	Safety Evaluations							
NO	Involve an unreviewe	, ,							
NO	Involve a change in the	-		ditions or Bases?					
NO	Require a change or a	ddition to the UFSA	R/USAR?						
Applicable to 10 CFR 72	2.48 Safety Evaluations								
NO	Involve a Significant	Increase in Occupati	onal Dose?						
NO	Involve a Significant								
110	2 /	7	monar impact.						
Prepared by: J. E. Reme	niuk Och) Dep	artment: <u>NED-CEU</u>	142-01-04 Date	: 11.7.97				
PRINT	ED NAME AND SIGNATUR	E							
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YES	Is a special review re-	quirea by groups oth	er than the group to	which the Prepai	rer beiongs?				
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Work Group: Licens		ork Group: PES	y	Work Group:					
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The POSRC has review	ed this evaluation accord	ding to NS-2-101.							
DOCDC Masting No.	97-135	Data		97					
POSRC Meeting No.:_	J/-130	Date.							
Recommend P	Recommend		1-1						
	Disapproval	Signature:	Cal	D	ate 11-24-97				
	, <u> </u>		OSRC CHAIRMAN						
			1		1/				
Approved/ I	Disapproved	Signature:	76/7		ate $12/1/57$				
		PL	ANT GENERAL MA	NAGER	() * /				
The OSSRC has review	The OSSRC has reviewed this evaluation according to NS-2-100.								
Full OSSRC Committee		s No	×						
- an observe community									
o OA -	ℓ_{2}	Date: 1/30/5	34/						
Signature:	EEC CHAIDMAN	Date:	10						
> 022BC 2	SES CHAIRMAN								
If you OSSDC Meeting	. Ma · ·								

ISFSI - Deletion of Loctite From Lifting Yoke Connection Bolts 72.48 Log No	
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.

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				ion 0000 Pa	

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.

ISFSI - Deletion of Loctite From L			og No.: SE00070
D3-LY-1; 67/129; ES19	9601368 Suppler		
		nent 001 Revision 000	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.

ISFSI - Deletion of Loctite From Lifting			
			g No.: SE00070
D3-LY-1; 67/129; ES1996013			
		1 Revision 0000	
	68 Supplement 00		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)

ISFSI - Lifting Yoke	e Bearing Plate <mark>Profile Desig</mark> n	Change	72.48 Log No.: SE00071					
D3-LY-2; 68/129;	ES199601368 Sup	oplement 001 Revi	sion 0000 Page 1 of 5					
Based on the attached d	liscussion, does this activity:							
Applicable to 10 CFR 5	50.59 and 10 CFR 72.48 Safety Evaluat	tions						
NO Involve an unreviewed safety question (USQ)?								
NO	Involve a change in the Technical S		ditions or Bases?					
NO	Require a change or addition to the	UFSAR/USAR?						
Applicable to 10 CFR 7	72.48 Safety Evaluations							
NO	Involve a Significant Increase in O							
NO	Involve a Significant Unreviewed E	Environmental Impact?						
Prepared by: J. E. Reme		Department; <u>NED-CEU</u>	42-01-04 Date: 11-7-97					
PRINT	TED NAME AND SIGNATURE							
YES	Is a special review required by grou	ips other than the group to	which the Preparer belongs?					
Resp. Ind.: G. Tesfa			Resp. Indv.; R. H. Beall					
Work Group: Licen	nsing Work Group: Pl	ES 1	Work Group: NFM					
Surachen Les lave	Fully Signature	11/10/97 (d)	SIGNATURE / DATE					
			_,					
Approved) Disapproved	Approved	Disapproved					
Signature: Ma	Kan M. A. OARR ENDENT REVIEWER	Signature: Multul	LJ. Sakara					
	/_		DES, CS-TES, or PE-PDSU					
Date///2	/97	Date 1 \ -	- 13-97					
The POSRC has review	wed this evaluation according to NS-2-	101.						
POSRC Meeting No.:_	97-/35	Date:	<i>97</i>					
	Recommend							
Approval 1	Disapproval Signature:	POSRC CHAIRMAN	Date <u>//-24-57</u>					
		POSKC CHAIRMAIN	//					
Approved	Disapproved Signature:	PLANT GENERAL MA	NAGER Date 12/157					
The OSSRC has reviewed this evaluation according to NS-2-100.								
Full OSSRC Committe	ee review required? Yes	NoX						
Signature: OKSRC	Date: /	130/95						
If yes, OSSRC Meeting	g No.: .:							

ISFSI - Lifting Yoke Bearing Plate Profile D	
	esign 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.

ISFSI - Lifting Yoke Bearing Pla			.48 Log No.: SE00071
	199601368 Supple		
D3-LY-2; 68/129; ES			0000 Page 3 of 5
		ment 001 Revision	

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.

ISFSI - Lifting Yoke Bearing Plate Profile Design Change 72.48 Log	g No.: SE00071
D3-LY-2; 68/129; ES199601368 Supplement 001 Revision 0000	

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.

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)

ISFSI - Lifting Yoke	Pin Support / Cradle De	esign Change	72.48	Log No.: SE00072					
D3-LY-3; 69/129;	ES199601368	Supplement 001	Revision 00	00 Page 1 of 5					
Based on the attached di	iscussion, does this activity:								
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety	Evaluations							
NO	Involve on summeries of softe	- martin (ICO)							
NO	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			Dusco:					
Applicable to 10 CFR 7	2.48 Safety Evaluations								
NO	Involve a Significant Increa								
NO	Involve a Significant Unrevi	iewed Environmental Imp	pact?						
Prepared by: J. E. Reme PRINT	eniuk Colorium Ced Name and Signature	Department: N	ED-CEU 42-01-04	Date: //- 7- 97					
YES	Is a special review required	by groups other than the	group to which the	Preparer belongs?					
Resp. Ind.: G. Tesfa Work Group: Licen	-	tv.: C. J. Dobry	•	ndv.: R. H. Beall Group: NFM					
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Setachen Lafant SIGNATURE/DATE	VII/12/97 SIGNA	1/10/97 DERE/DATE	SIG	//////////////////////////////////////					
Approved	Disapproved	Appro	ved	Disapproved					
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Signature: / MCC	CALL M.A. CARR ENDENT REVIEWER	Signature: Mu	LOCEDIOCETE	Takeran					
1 -	1		FOR CS-DESCS-TI						
Date///12	[[]	Date	11-13-9	1					
The POSRC has review	ved this evaluation according to	NS-2-101.							
POSRC Meeting No.:_	_97-/35	Date:	26.97						
Recommend P	Recommend	0100							
Approval I	Disapproval Sign	nature:	ll_	Date _//-24-97					
		PÓSRC CHA	IRMAN	1 /					
Approved I	Disapproved Sign	nature: PLANT GENE	RAL MANAGER	Date: 2/1/57					
The OSSRC has review	ved this evaluation according to	NS-2-100.							
Full OSSRC Committee	e review required? Yes	NoX							
Signature Signature OSSRC S	Da SES CHAIRMAN	ate: <u>//30/98</u>							
If yes, OSSRC Meeting	g No.: .:								

l - Lifting Yoke				
				o.: SE00072
Y-3; 69/129;	9601368			
		Supplem		
			evision 0000	

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.

ISFSI - Lifting Yoke Pin Support / Cradle Design Change	
	72.48 Log No.: SE00072
D3-LY-3; 69/129; ES199601368 Supplement 00*	
	1 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.

ISFSI - Lifting Yoke Pin Suppor			
			.og No.: SE00072
D3-LY-3; 69/129; ES	199601368 Supplen		
		nent 001 Revision 000	0 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.

ISFSI - Lifting Yoke Pin Suppo		2.48 Log No.: SE00072
D3-LY-3; 69/129; E	9601368 Supplem	
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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 (USO)
- 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)

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 Co. Department: NED-CEU 42-01-04 Date: //-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 Work Group: NFM							
SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE							
Approved Disapproved Disapproved							
Signature: Malan M. A. CARR Signature: Muliail J. Gaharan INDEPENDENT REVIEWER Signature: Muliail J. Gaharan FORS DES, OS-TES, or PE-PDSU							
Date							
The POSRC has reviewed this evaluation according to NS-2-101.							
POSRC Meeting No.: 97-135 Date: 11-26-97							
Recommend Approval Disapproval Signature: Date 11-24-37							
Approved Disapproved Signature: Date 2/1/57							
The OSSRC has reviewed this evaluation according to NS-2-100.							
Full OSSRC Committee review required? Yes No _X							
Signature: Date: 1/30/98 OSSRE SES CHAIRMAN							
If yes, OSSRC Meeting No.: .:							

ISFSI - Lifting Yoke Cable Assem			
		72.48 Log No	
D3-LY-4: 70/129; ES19	9601368 Supplement 001		
	9601368 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.

			2.48 Log No.: SE00073
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3-LY-4; 70/129			n 0000 Page 3 of 5
		lement 001 R	
			n 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.

ISFSI - Lifting Yoke Cable /			72.48 Log No.: SE00073
D3-LY-4: 70/129:			
	ES199601368 Suppl	ement 001 Revision	on 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.

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)

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ISFSI - Lifting Yoke	Fab Plate Max Thickness	Non Conformance	72.48 Log No.: \$	SE00074			
D4-LY-1; 71/129;	ES199601368	Supplement 001 R	evision 0000 Pag	je 1 of 5			
Pased on the attached dis	cussion, does this activity:						
	•	almatiana					
Applicable to 10 CFR 50.	59 and 10 CFR 72.48 Safety Ev	aruations					
NO	Involve an unreviewed safety q		0 11:1 B A				
NO NO	Involve a change in the Techni Require a change or addition to		Conditions or Bases?				
Applicable to 10 CFR 72	-						
NO	Involve a Significant Increase	in Occupational Dose?					
NO	Involve a Significant Unreview						
Prepared by: J. E. Remen	iuk O CAC D NAME AND SIGNATURE	Department: NED-0	CEU 42-01-04 Date: //	7.97			
YES	Is a special review required by	groups other than the group	p to which the Preparer bel	longs?			
Resp. Ind.: G. Tesfay	-	C. J. Dobry	Resp. Indv.: R. H. B	Beall			
Work Group: Licensi	ng Work Grou	p: PES 1	Work Group: NFM				
Metashen Lastone SIGNATURE / DATE	SIGNATU	11/10/97 REIBATE	SIGNATURE / DATE	1/1/97			
Approved	Disapproved	Approved	Disapproved	i			
Signature: INDEPEN	DENT REVIEWER	Signature: Much	all. Galance GS DES CS-TES, or PE-PDSU AFT J. CTAHANTI				
Date	77	Date	11-13-97	<u> </u>			
The POSRC has reviewe	d this evaluation according to N	S-2-101.					
POSRC Meeting No.:	97-135	Date: 11.26	5.97	_			
	ecommend sapproval Signate	ure: POSRC CHAIRM	Date_	11-24-97			
Approved Di	isapproved Signat		Date 1	41/57			
The OSSRC has reviewed this evaluation according to NS-2-100.							
Full OSSRC Committee	Full OSSRC Committee review required? Yes No						
Signature: OSSRC SE	Date:	1/30/98					
If yes OSSPC Meeting	No · ·						

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.

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.

	late Max Thickness Non Confo	
		Vo.: SE00074
D4-LY-1; 71/129;		
	ES199601368 Supplement	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.

ISFSI - Lifting Yoke Fab Plate Max Thickness Non Conformance 72.4	
	8 Log No.: SE00074
D4-LY-1; 71/129; ES199601368 Supplement 001 Revision 0	
D4-LY-1; 71/129; ES199601368 Supplement 001 Revision 0	
	000 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)

ISFSI - Lifting Yoke	Bearing Plate Material Non	Conformance	72.48 Log No.: SE00075				
D4-LY-2; 72/129;	ES199601368 S	upplement 001 Revi	sion 0000 Page 1 of 5				
Based on the attached di	scussion, does this activity:						
Applicable to 10 CFR 50).59 and 10 CFR 72.48 Safety Evalu	ations					
NO NO NO	NO Involve a change in the Technical Specifications/License Conditions or Bases?						
Applicable to 10 CFR 72	2.48 Safety Evaluations						
NO NO	Involve a Significant Increase in Involve a Significant Unreviewed						
Prepared by: <u>J. E. Reme</u> PRINT	niuk Color and signature	Department: NED-CEU	J 42-01-04 Date: 1/- 7-97				
YES	Is a special review required by g	roups other than the group to	which the Preparer belongs?				
Resp. Ind.: G. Tesfa Work Group: Licens			Resp. Indv.: R. H. Beall Work Group: NFM				
Letachen Infance SIGNATURE / DATE	y 11/n/97 SIGNAPUR	11/10/97 (SIGNATURE / DATE				
Approved) Disapproved	Approved	Disapproved				
Signature:	MIA CANRESTER CA	Signature: Michael Jores	LA LANGU DESGSTES, OF PEPDSU L. CAHANTII				
Date /1/12	197		1-13-97				
The POSRC has review	ved this evaluation according to NS	2-101.					
POSRC Meeting No.:_	97-135	Date: //-26.	97				
	Recommend Disapproval Signatu	POSRC CHAIRMAN	Date 1/-24-97				
Approved	Disapproved Signatu	re: PLANT GENERAL M.	Date 12/1/57				
The OSSRC has review	wed this evaluation according to NS	-2-100.					
Full OSSRC Committee	ee review required? Yes						
Signature: OSSRO	SES CHAIRMAN Date:	1/30/98					
If yes, OSSRC Meeting	g No.: .:						

		72.48 Log No.: SE00075
ISFSI - Lifting Yoke Bearing Plat		
	99601368 Supplement 001 Re	vision 0000 Page 2 of 5
	99601368 Supplement 001 Re	
D4-LY-2: 72/129; ES1:		
		vision 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.

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 $9\% \pm 1/2\%$. 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 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.

		Log No.: SE00075
ISFSI - Lifting Yoke Bearing Plate M		
D4-LY-2: 72/129: ES1996		
D4-LY-2; 72/129; ES1996	01368 Supplem	00 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.

	rial Non Conformance	
		72.48 Log No.: SE00075
	68 Supplement 001 Re	vision 0000 Page 5 of 5
)4-LY-2; 72/129;		

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)

ISFSI - Lifting Yoke Bea	ms Maximum Spacing N	on Conformance	72.48 Log No.: SE00076
D4-LY-3; 73/129;	ES199601368 Su	oplement 001 Re	vision 0000 Page 1 of 5
Based on the attached discussi	on, does this activity:		
Applicable to 10 CFR 50.59 ar	nd 10 CFR 72.48 Safety Evalua	tions	
NO Inv	olve an unreviewed safety quest	ion (USQ)?	
	olve a change in the Technical		onditions or Bases?
NO REC	uire a change or addition to the	UFSAK/USAK/	
Applicable to 10 CFR 72.48 S	Safety Evaluations		
	olve a Significant Increase in O		
NO Inv	olve a Significant Unreviewed I	Environmental Impact?	
Prepared by: J. E. Remeniuk	ME AND SIGNATURE	Department: NED-CH	EU 42-01-04 Date: 11-7-97
·			
YES Is a	special review required by ground	ups other than the group	to which the Preparer belongs?
Resp. Ind.: G. Tesfaye	Resp. Indv.: C.		Resp. Indv.: R. H. Beall
Work Group: Licensing	Work Group: P.	ES //	Work Group: NFM
hetachewordant "	In a Signature	11/10/97 DATE	SIGNATURE / DATE
Annavad	Disammand		Pinnend
Approved	Disapproved	Approved	Disapproved
Signature: INDEPENDENT	M. A. CARR TREVIEWER	Signature: Much	S-DES, ES-TES, or PE-PDSU
Date /1/12/97	7	Date	EC J. CTAHANDI 11-13-97
			11 13 11
	s evaluation according to NS-2-		- 6
POSRC Meeting No.: 9	7-/35	Date: //- 26	·9'/
Recommend Recommend		01-1	// 11 21 C7
Approval Disapp	roval Signature:	POSRC CHAIRMA	Date 11-24-97
Approved V Disapp	roved Signature:	Photo	Date $\frac{2}{4}$
Approved	Joven Signature.	PLANT GENERAL M	
The OSSRC has reviewed this	s evaluation according to NS-2-	·100.	1
Full OSSRC Committee revie	ew required? Yes	No <u>X</u>	
as I		1 / /	
Signature: OSSRC SES CH	Date: /	130/98	
If yes, OSSRC Meeting No.:			

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.

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.

ISFSI - Lifting Yoke Beams Maximum Spacing Non C	Conformance 72.48 Log No.: SE00076
D4-LY-3; 73/129; ES199601368 Supple	ment 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:

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.

	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)

ISFSI - HSM Air Flo	w		72.48 Log	No.: SE00077
A UOM O TAMOO		_		
A-HSM-6; 74/129;	ES199601368	Supplement 001	Revision 0000	Page 1 of 5
Based on the attached di	scussion, does this activity:			
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety I	Evaluations		
NO	Involve an unreviewed safety			
NO NO	Involve a change in the Tech Require a change or addition		se Conditions or Bases	?
	-	to the orsanosan;		
Applicable to 10 CFR 72	2.48 Safety Evaluations			
NO	Involve a Significant Increas			
NO	Involve a Significant Unrevi	ewed Environmental Impa	ict?	
Prepared by: J. E. Remer	niuk A CONTROLLER SIGNATURE	Department: <u>NE</u>	D-CEU 42-01-04 Dat	e: <u>//- 7- 97</u>
YES	Is a special review required	by groups other than the g	roup to which the Prepa	rer belongs?
Resp. Ind.: G. Tesfay	•	v.: C. J. Dobry	Resp. Indv.: F	
Work Group: Licens	ing Work Gr	oup: PES	Work Group:	NFM
Silaohen Leo Mulle Signature / Date	signal	// 11/10/97 PURE/DATE/	SIGNATUR	4 11/11/47 E/DATE
Approved	Disapproved	Approve	Disap	proved
Signature: INDEPER	M.A. CARC	_ Signature Mus	hall, Lak	unan E-PDSU
Date ///2/	97	Date	11-13-97) <u> </u>
The POSRC has reviewe	ed this evaluation according to	NS-2-101.		
POSRC Meeting No.:			1.97	
Recommend R	ecommend		n <u>-</u>	
		POSRC CHAI	D	ate 12-1-97
Approved D	risapproved Sign	ature:		Pate 12/4/57
The OSSRC has reviewe	ed this evaluation according to	NS-2-100.		
Full OSSRC Committee	review required? Yes	NoX		
Signature: OSSRE'S	Enone Da Es Chairman	te: <u>//30/98</u>		
If yes, OSSRC Meeting	No.:			

ISFSI - HSM Air			
			72.48 Log No.: SE00077
A-HSM-6; 74/129			
			vision 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.

ISFSI - HSM Air Flow 72 48 Log No : SE00077
ISFSI - HSM AIR Flow 72.48 Log No.: SE00077
A-HSM-6; 74/129; ES199601368 Supplement 001 Revision 0000 Page 3 of 5
A-HSM-6; 74/129; ES199601368 Supplement 001 Revision 0000 Page 3 of 5
A-HSM-6; /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 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.

4 %

ATTACHMENT 3, SAFETY EVALUATION FORM

HSM Air F			
			y No.: SE00077
-6; 74/129;			
			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
 - 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.

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)

ISFSI - HSM Contac	ct Dose Rates			72.48 l	_og No.: SE00078
A-HSM-7; 75/129;	ES199	601368 Su	ipplement 001	Revision 000	0 Page 1 of 5
Based on the attached di	iscussion, does this	activity:			
Applicable to 10 CFR 50	0.59 and 10 CFR 72	.48 Safety Evalu	ations		
NO	Involve an unrev	iewed safety ques	tion (USO)?		
NO	Involve a change	in the Technical	Specifications/Licens	se Conditions or I	Bases?
NO	Require a change	e or addition to th	e UFSAR/USAR?		
Applicable to 10 CFR 7	2.48 Safety Evaluat	tions			
NO	Involve a Signific	cant Increase in (Occupational Dose?		
NO	Involve a Signifi	cant Unreviewed	Environmental Impa	ct?	
Prepared by: J. E. Reme PRINT	niuk Color ED NAME AND SIGN	ATURE	Department: <u>NE</u>	D-CEU 42-01-04	Date: 11-7-97
YES	Is a special revie	w required by gro	oups other than the gr	oup to which the	Preparer belongs?
Resp. Ind.: G. Tesfa		Resp. Indv.: C.			dv.: R. H. Beall
Work Group: Licens	sing	Work Group: 1	PES	Work G	roup: NFM
Sutashew for funda SIGNATURE / DATE	W.1/12/99	SIGNATURE	11/10/97 DATE	MAN SIGN	ATURE/DATE
Approved	Disapp	proved	Approve	d	Disapproved
Signature: NAC INDEPE	M, A. NDENT REVIEWER	CARK	Signature: Mu	OKGS-DES, OS-TES	S, or PE-PDSU
Date	2/97		Date	11-13-97	
The POSRC has review	ed this evaluation a	ccording to NS-2	-101.		
POSRC Meeting No.:_	97-136	• !	Date:	.1.97	
	Recommend		2//		_ 14 (05
Approval I	Disapproval	Signature	POSRC CHAIR	RMAN	Date <u>/ と-/ - </u>
Approved I	Disapproved	Signature		AL MANAGER	Date 12/4/5)
The OSSRC has review	ed this evaluation a	according to NS-2	Q		
Full OSSRC Committee		Yes	No 🗡		
Signature:	lmon Es chairman	Date:	1/30/98		
If ves OSSRC Meeting	. No ·				

ISFSI - HSM Contact Dose Rates	
	72:48 Log No.: SE00078
A-HSM-7; 75/129; ES199601	
	368 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.

ISFSI - HSM Contact Dose Rates		
	72.48 Log No.: SE0007	
A-HSM-7; 75/129; ES19		
	ent 001 Revision 0000 Page 3 of	

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? <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 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.

ISFSI - HSM Contact Dose Ra			
			No.: SE00078
A-HSM-7; 75/129; E			
			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.

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)

ISFSI - HSM Reinfor	rced Concrete I	oad Combina	tions	72.481	og No.; SE00079
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A-HSM-9; 76/129;	ES1996	601368 Sup	plement 001	Revision 0000	D Page 1 of 5
Based on the attached dis	scussion, does this a	ctivity:			
Applicable to 10 CFR 50		•	ions		
					
NO NO	Involve an unrevie		ion (USQ)? Specifications/Licens	e Conditions or P	Crean
NO	Require a change			c Conditions of D	ases (
Applicable to 10 CFR 72	2.48 Safety Evaluati	<u>ons</u>			
NO	Involve a Signific	ant Increase in O	ccupational Dose?		
NO	Involve a Signification	ant Unreviewed E	Environmental Impac	et?	
Prepared by: J. E. Remer	niuk O COL ED NAME AND SIGNA	TURE	Department: <u>NEI</u>	O-CEU 42-01-04	Date: 11.7.97
YES	Is a special review	v required by grou	ps other than the gro	oup to which the F	Preparer belongs?
Resp. Ind.: G. Tesfay	<i>-</i> /	Resp. Indv.: C. J			lv.: R. H. Beall
Work Group: Licens	sing	Work Group: PI	ES 1	Work Gr	oup: NFM
Machin Les lay & SIGNATURE / BATE	n/n/97 _	SIGNATURE /	11/10/97 DATE	SIGNA	MU 11/11/97 TURE/DATE
Approved	Disappr	roved	Approved	D 1	Disapproved
Signature: MQ INDEPER	Cur M. NDENT REVIEWER	A. CAM	Signature: Mus	CS-DES GS-TES	or PE-PDSU
Date	97		Date	11-14-97	——————————————————————————————————————
The POSRC has reviewe	ed this evaluation ac	cording to NS-2-	101.		
POSRC Meeting No.:	97-136		Date:	1.97	
Recommend R	ecommend				
Approval D	oisapproval	_ Signature	POSRC CHAIR	MAN	_ Date <u>/2-/-97</u>
Approved D	Disapproved	_ Signature:	PLANT GENERA		Date
The OSSRC has review	ed this evaluation ac	cording to NS-2-	100.		
Full OSSRC Committee	e review required?	Yes	No_X		
Signature: OSSRC S	<i>lmonu</i> Es chairman	Date:/	130/98		
If ves. OSSRC Meeting	No ·				

ISFSI - HSM Reinforced Concrete Load Combinations 72.48 Log No.: SE0007	
A-HSM-9; 76/129; ES199601368 Supplement 001 Revision 0000 Page 2 of	
A-HSM-9; 76/129; ES199601368 Supplement 001 Revision 0000 Page 2 of	

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.

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.

ISFSI - HSM Reinforced Concrete Load Combinations 72.48 Log No.: SE00079
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
A-HSM-9; 76/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5
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? <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 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.

ISFSI - HSM Reinforced			72.48 Log No.: SE00079
A-HSM-9; 76/129;	ES199601368 S		sion 0000 Page 5 of 5
		upplement 001 Revi	sion 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)

ISFSI - HSM Roof S	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 di	iscussion, does this activity:				
Applicable to 10 CFR 50	0.59 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	2.48 Safety Evaluations				
NO	Involve a Significant Increase in Occupational Dose?				
NO	Involve a Significant Unreviewed Environmental Impact?				
Prepared by: J. E. Reme:	niuk O C Department: NED-CEU 42-01-04 Date: 11.7.97 ED NAME AND SIGNATURE				
YES	Is a special review required by groups other than the group to which the Preparer belongs?				
Resp. Ind.: G. Tesfa	ye Resp. Indv.: C. J. Dobry Resp. Indv.: R. H. Beall				
Work Group: Licens					
41.	-1. M.				
SIGNATURE / DATE	SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE				
Approved	Disconnected				
Approved	Disapproved Approved Disapproved				
Signature: //www.	NOENT REVIEWER Signature: Muchael & Sahangai				
/ /	MICHAEL J. GAHANIII				
Date	97 Date 11-13-97				
The POSRC has reviewed	ed this evaluation according to NS-2-101.				
POSRC Meeting No.:	97-136 Date: 12.1.97				
Recommend R	ecommend				
	pisapproval Date 12-1-97				
	POSRC CHAIRMAN				
Approved D	Disapproved Signature: $Y(\xi)$ Date $17/4/5$				
	PLANT GENERAL MANAGER				
The OSSRC has reviewed this evaluation according to NS-2-100.					
Full OSSRC Committee review required? Yes NoX					
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN					
If yes, OSSRC Meeting	No.: .:				

ISFSI - HSM Roof Shield Heat	
	: Bolts Design Change 72.48 Log No.: SE00080
D3-HSM-1; 77/129; E	
	S199601368 Supplement 001 Revision 0000 Page 2 of 5
	S199601368 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.

	FSI - HSM Roof S		
			Design Change 72.48 Log No.: SE00080
	3-HSM-1; 77/129;		
		ES199	
			1368 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.

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

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.

ISFSI - HSM Roof Shield Heat Bolts De		
	sign Change 72.48 Log No.: SE00	
D3-HSM-1; 77/129; ES1996013		
D3-HSM-1; 77/129; ES1996013		
	368 Supplement 001 Revision 0000 Page 4 (

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.

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)

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ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM Temporary Hand Rails	72.48 Log No.: SE00081
D3-HSM-2; 78/129; ES199601368 Supplement 001 Rev	rision 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 (USO)?	
NO Involve an unreviewed safety question (USQ)? NO Involve a change in the Technical Specifications/License Cor	editions or Bases?
NO Require a change or addition to the UFSAR/USAR?	MILOUS OF DEBOS!
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-CEI PRINTED NAME AND SIGNATURE	U 42-01-04 Date: 1/- 7- 9.7
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
Machine Marie 11/197 / SIGNATURE / DATE / SIGNATURE / DATE	243/24/11/197 SIGNATURE / DATE
Approved Disapproved Approved	Disapproved
Signature: Malan M. A. CARR Signature: Muhan Fords	LJ. Lahana DESESTES, or PE-PDSU
MICHAEL MICHAEL	J.GAHANIII
The POSRC has reviewed this evaluation according to NS-2-101.	
POSRC Meeting No.: 97-/36 Date: 12-/-9	7
Recommend Recommend	
Approval Signature:	Date /2-/-97
POSRC CHAIRMAN	
Approved Signature:PLANT GENERAL MA	ANAGER Date 12/4/57
The OSSRC has reviewed this evaluation according to NS-2-100.	
Full OSSRC Committee review required? Yes NoX	
Signature: Date: 1/30/98	
If yes OSSDC Meeting No · ·	

ISFSI - HSM Temporary Hand Ra	
	72.48 Log No.: SE00081
D3-HSM-2; 78/129; ES19	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.

ISFSI - HSM Temporary Hand Rails 72.48 Log No.: SE	
ISFSI - HSM Temporary Hand Rails 72.48 Log No.: SE	
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.

ISFSI - HSM Temporary Hand F		
		No.: SE00081
D3-HSM-2; 78/129; ES		
	9601368 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,

ISFSI - HSM Temporary Hand Rails 72.48 Log No.: SE00	
ISFSI - HSM Temporary Hand Rails 72.48 Log No.: SE00	
D3-HSM-2; 78/129; ES199601368 Supplement 001 Revision 0000 Page 5	
D3-HSM-2; 78/129; ES199601368 Supplement 001 Revision 0000 Page 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)

ISESI - HSM Secon	dary Roof Slopes in Front o	f Outlet Vents	72.48 Log No.: SE00082				
	,	. Oddet Ferna	12:40 LOG 110:: SL00002				
D3-HSM-3; 79/129;	ES199601368 S	upplement 001 Revi	sion 0000 Page 1 of 5				
Based on the attached discussion, does this activity:							
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Eval	uations					
210	T 1						
NO NO	Involve an unreviewed safety que Involve a change in the Technica		ditions of Posse?				
NO	Require a change or addition to t		uitions of Dases!				
Applicable to 10 CFR 72	2.48 Safety Evaluations						
NO	Involve a Significant Increase in						
NO	Involve a Significant Unreviewed	d Environmental Impact?					
Prepared by: J. E. Remer	niuk OCO CONTRACTOR AND SIGNATURE	Department: <u>NED-CEU</u>	142-01-04 Date: //- 7-97				
YES	Is a special review required by gr	roups other than the group to	which the Preparer belongs?				
Resp. Ind.: G. Tesfa: Work Group: Licens			Resp. Indv.: R. H. Beall Work Group: NFM				
Wilson		111 11 1	Midiale				
SIGNATURE / DATE	SIGNATURE	11/10/97 (A	SIGNATURE / DATE				
Approved	Disapproved	Approved	Disapproved				
Signature:	palan M. A CARR	Signature: Mulau	G. Schara				
/	NDENT REVIEWER	MICHAEI	DES GS-TES, or PE-PDSU				
Date	97		-13-97				
The POSRC has reviewe	ed this evaluation according to NS-	2-101.					
POSRC Meeting No.:	97-/36	Date: 12.1.9	7				
Recommend R	ecommend	01-0					
	pisapproval Signatur	e: John, Cal	Date /2-1-9)				
· — /	/	POSRC CHAIRMAN					
Approved D	Pisapproved Signatur	· DVSD	Date 12/4/57				
PLAND GENERAL MANAGER							
The OSSRC has reviewed this evaluation according to NS-2-100.							
Full OSSRC Committee review required? Yes No							
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN							
If yes, OSSRC Meeting	No.: .:						

ISFSI - HSM Secondary R					
				2.48 Log No.: S	
D3-HSM-3; 79/129;	ES199601368				
		Supplement	001 Revisior		e 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.

ISFSI - HSM Secondary Roof 9			8 Log No.: SE00082
D3-HSM-3; 79/129; ES	S199601368 Supp		
		lement 001	
			000 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? <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?

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.

ISFSI - HSM Secondary Roof Slopes in Front of Outlet Vents	
	72.48 Log No.: SE00082
D3-HSM-3; 79/129; ES199601368 Supplement 001 Re	
D3-HSM-3; 79/129; ES199601368 Supplement 001 Re	evision 0000 Page 4 of 5
	evision 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.

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)

ISFSI - HSM Roof Fin D3-HSM-4; 80/129;	nish Requirements ES199601368 Supplemen	72.48 Log No.: SE00083 nt 001 Revision 0000 Page 1 of 5
Based on the attached disc	cussion, does this activity:	
Applicable to 10 CFR 50.5	59 and 10 CFR 72.48 Safety Evaluations	
	Involve an unreviewed safety question (USQ	
	Involve a change in the Technical Specificat Require a change or addition to the UFSAR/	
	-	ODAKI
Applicable to 10 CFR 72.4	18 Safety Evaluations	
	Involve a Significant Increase in Occupation Involve a Significant Unreviewed Environment	
	\sim 100	
Prepared by: J. E. Remeni	DEPARTMENT	tment: NED-CEU 42-01-04 Date: //· 7.97
		than the group to which the Preparer belongs?
Resp. Ind.: G. Tesfaye Work Group: Licensin		Resp. Indv.: R. H. Beall Work Group: NFM
1 6 4		Mil Bo Die I
SIGNATURE / DATE	SIGNATURE / DATE	SIGNATURE / DATE
(Approved)	Disapproved	Approved Disapproved
Signature: Mal	7	re: Michael J. Gahanan
INDEPEND	DENT REVIEWER	FOR CS-DESIGS-TES, OF PE-PDSU MICHAEL J. CAHAN III
Date ////3/9	Date	11-13-97
The POSRC has reviewed	this evaluation according to NS-2-101.	
POSRC Meeting No.:	97-136 Date:	12.1.97
	commend Signature Signature	Call Date /2-1-87
7 ipproving Dis	POS:	RC CHAIRMAN
Approved Dis	sapproved Signature:PLAN	Date 17/1/57
The OSSRC has reviewed	this evaluation according to NS-2-100.	
Full OSSRC Committee r	review required? Yes No	<u> </u>
Signature: OSSRC SES	mon Date: 1/30/98	<u><</u>
If yes, OSSRC Meeting N	lo.: .:	

ISFSI - HSM Roof Finish Requirements	72.48 Log No.: SE00083
D3-HSM-4; 80/129; ES199601368 Suppleme	
	nt 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.

ISFSI - HSM Roof Finish Require	ements 72.48 Log No.: SE00083
D3-HSM-4; 80/129; ES1	99601368 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.

ISFSI - HSM Roof Finish Requirements 72.48 Log N	
	No.: SE00083
	Page 4 of 5
D3-HSM-4; 80/129; ES199601368 Supplement 001 Revision 0000	

- 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.

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)

ISFSI - HSM Inlet & D3-HSM-5; 81/129;			pplement 001	72.48 Lo	g No.: SE00084 Page 1 of 5
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Based on the attached d	iscussion, does this	activity:			
Applicable to 10 CFR 5	0.59 and 10 CFR 72	.48 Safety Evalua	tions		
МО	Involve an unrev	iewed safety quest	tion (USQ)?		
NO NO			Specifications/License UFSAR/USAR?	Conditions or Ba	ses?
NO	Require a change	or addition to the	e OFSAROUSAR!		
Applicable to 10 CFR 7	2.48 Safety Evaluat	tions			
NO			ccupational Dose?		
NO	Involve a Signifi	cant Unreviewed	Environmental Impact	?	
Prepared by: J. E. Reme		\ll	Department: NED	-CEU 42-01-04	Date: <u>//- 7- 97</u>
PRINT	TED NAME AND SIGN	ATURE			
YES	Is a special revie	w required by gro	ups other than the gro	up to which the Pr	eparer belongs?
Resp. Ind.: G. Tesfa	•	Resp. Indv.: C.	~	-	.: R. H. Beall
Work Group: Licen	sing	Work Group: P	ES	Work Gro	up: NFM
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The POSRC has review		•	101.		
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The OCCDC has review		anding to NC 2	0		
The OSSRC has review		•			
Full OSSRC Committe	e review required?	162	1 /		
Signature: Jossik	Emoni SES CHAIRMAN	Date:	1/30/98		
If yes, OSSRC Meeting	g No.: .:				

ISFSI - HSM Inlet & Outlet Screens	
	72.48 Log No.: SE00084
D3-HSM-5; 81/129; ES199601368 Suppl	
	ement 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.

ISFSI - HSM Inlet & Outlet Screen		72.48 Log No.: SE00084
D3-HSM-5; 81/129; ES19	9601368 Supplement 001	
	9601368 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 offnormal 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

ISFSI - HSM Inlet & (
		og No.: SE00084
D3-HSM-5; 81/129;	ES199601368 Supp	
		0 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
 - 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.

	72.48 Log No.: SE00084
ISFSI - HSM Inlet & Outlet Screens	
D3-HSM-5; 81/129; ES199601368 Supplement 001	
D3-HSM-5; 81/129; ES199601368 Supplement 001	

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)

ISFSI - HSM Cask Res		-alamant 004 - Facility	72.48 Log No.: SE00085
D3-HSM-6; 82/129;	ES199601368 Su	pplement 001 Revi	sion 0000 Page 1 of 5
Based on the attached discus	•		
Applicable to 10 CFR 50.59	and 10 CFR 72.48 Safety Evalua	<u>tions</u>	
NO T	nvolve an unreviewed safety quest	ion (IICO)?	
	evolve an unreviewed safety quest evolve a change in the Technical	* **	litions or Bases?
	equire a change or addition to the		
Applicable to 10 CFR 72.48	Safety Evaluations		
•			
	nvolve a Significant Increase in C		
NO I	nvolve a Significant Unreviewed	Environmental Impact?	
Prepared by: J. E. Remeniul PRINTED S	AME AND SIGNATURE	Department: <u>NED-CEU</u>	42-01-04 Date: //- 7-97
YES I	s a special review required by gro	ups 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: NFM
			MIBIRA Who
SIGNATURE / DATE	signature	11/10/97 W	SIGNATURE / DATE
			Di
Approved	Disapproved	Approved	Disapproved
Signature: Mala	m. A. CARR	Signature: Muhae	ld. Gakaran
	ENT REVIEWER	for CS	DES GS-TES, or PE-PDSU
Date	1/97	Date MICHAEL	J. GAHANIII
The POSRC has reviewed to	his evaluation according to NS-2	-101.	
POSRC Meeting No.:	_		7
POSRC Meeting No.:	97-736	Date: <u>/2-/-9</u>	
Recommend Reco	ommend	0/0	
Approval Disa	pproval Signature		Date 12-1-97
		POSRC CHAIRMAN	1.1
Approved Disa	pproved Signature	· Phas	Date 12/4/57
Approvou	*Provou 5:8::::::::	PLANT GENERAL MA	NAGER
The OSSRC has reviewed	this evaluation according to NS-2	∂ -100.	
Full OSSRC Committee re	view required? Yes	No 💢	
Signature: OSSRC SES	Date: _/	1/30/98	
If you OSSDC Meeting No			

ISFSI - HSM Cask Restraint Design Change 72	
	.48 Log No.: SE00085
D3-HSM-6; 82/129; ES199601368 Supplement 001 Revision	

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.

- HSM Cask Restrai	t Design Change 72.48 Log No.:	
SM-6; 82/129;	ES199601368 Supplement 001 Revision 0000 Par	
	ES199601368 Supplement 001 Revision 0000 Page	ge 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.

ISFSI - HSM Cask Restraint Design Change 72.48 Log No.: S	
D3-HSM-6; 82/129; ES199601368 Supplement 001 Revision 0000 Page	e 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.

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)

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ISFSI - HSM Slab Ed	lge Bars		72.48 Lo	g No.: SE00086
D3-HSM-7; 83/129;	ES199601368 S	iupplement 001	Revision 0000	Page 1 of 5
Based on the attached dis	cussion, does this activity:			
Applicable to 10 CFR 50	.59 and 10 CFR 72.48 Safety Eval	uations		
NO NO NO	Involve an unreviewed safety que Involve a change in the Technic Require a change or addition to	al Specifications/Licer	se Conditions or Bas	es?
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: 1/- 7-97				
YES	Is a special review required by g	roups other than the g	roup to which the Pro	eparer belongs?
Resp. Ind.: G. Tesfay Work Group: Licensi		PES 11/10/97	Work Grow	:: R. H. Beall ip: NFM /////97 URE/DATE
11	Disapproved M. A. CARK IDENT REVIEWER	MIC	hall Ja CSDES OSTES, O HAEL J. GAL	
Date	17	Date	11-13-97	
	d this evaluation according to NS	-2-101.		
POSRC Meeting No.:	97-/36	Date:	1.97	
	ecommend isapproval Signatu	POSRC CHAIL	RMAN	Date 121-87
	isapproved Signatu	PLANT GENER	AL MANAGER	Date 17 1/57
	ed this evaluation according to NS	3.4		
Signature: M37	Preview required? Yes LIMON Date: ES CHAIRMAN	1 /		
If ves. OSSRC Meeting	No.: .:			

ISFSI - HSM Slab Edge Bars 72:48 Log No.: S	
D3-HSM-7; 83/129; ES199601368 Supplement 001 Revision 0000 Page	
D3-HSM-7; 83/129; ES199601368 Supplement 001 Revision 0000 Page	

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.

ISFSI - HSM Slab Edge Bars	72.48 Log No.: SE00086
D3-HSM-7; 83/129; ES19	9601368 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.

ISFSI - HSM Slab Edge Bars 72.48 I	_og No.: SE00086
D3-HSM-7; 83/129; ES199601368 Supplement 001 Revision 000	
D3-HSM-7; 83/129; ES199601368 Supplement 001 Revision 000	

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.

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)

ISFSI - HSM Welded	l Wire Fabric Design Chan	le .	72.48 Lo	g No.: SE00087
D3-HSM-8; 84/129;	ES199601368 S	upplement 001	Revision 0000	Page 1 of 5
Based on the attached dis	scussion, does this activity:			
	.59 and 10 CFR 72.48 Safety Eval	uatione		
Applicable to 10 Cl K 50	.57 and 10 CIR 72.46 Saicty Evai	uations		
NO	Involve an unreviewed safety qu			_
NO NO	Involve a change in the Technical Require a change or addition to		se Conditions or Ba	ses?
NO	require a change of addition to	IIIC OFSAROUSAR?		
Applicable to 10 CFR 72	.48 Safety Evaluations			
NO	Involve a Significant Increase in	Occupational Dose?		
NO	Involve a Significant Unreviewe		ct?	
Prepared by: J. E. Remer	int Ord 1 R	Danastmanti NE	D CELL 42 01 04	Date: 11-7-97
	ED NAME AND SIGNATURE	Department: NE	D-CEU 42-01-04	Date: //* / - / (
XTC 0		49 49 49		
YES	Is a special review required by g	roups other than the g	roup to which the Pi	reparer belongs?
Resp. Ind.: G. Tesfay			_	v.: R. H. Beall
Work Group: Licens	ing Work Group	PES	Work Gro	up: NFM
hotel Only	el la lan INI	11 1-	7 1137	VII 11/1/92
SIGNATURE / DATE	//n/n/g? SIGNATUR	E/DATE /	SIGNA'	CVC (((((((((((((((((((
			-	
Approved	Disapproved	Approve	$\times d$ D	isapproved
Signature: Ral	u M.A. CARR	Signature: Muc	halo Go	Rancin
	NDENT REVIEWER		OF CS DEB CS TES,	or PE-PDSU
Date ///13 / 9	7	Date	11-13-97	ANU
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
	ed this evaluation according to NS	-2-101.		
POSRC Meeting No.:	97-136	Date:	· <i> •97</i>	
RecommendR	ecommend			
	isapproval Signatur	re: ///	all	Date 12-1-87
/		POSRC CHAIL	RMAN	
Approved \sqrt{D}	isapproved Signatus	re: PKT)	Date 17/4/57
<u>v</u>	organica.	PLANT GENER	AL MANAGER	- Jan
The OSSRC has reviewe	ed this evaluation according to NS	-2-100.		
Full OSSRC Committee	review required? Yes	No 💢		
	1.	, 1		
Signature: OSSRC'S	LIMONN Date: _ ES CHAIRMAN	,/30/98		
If yes, OSSRC Meeting	No.: .:			

ISFSI - HSM Welded Wire Fabric Design Change	72.48 Log No.: SE00087
D3-HSM-8; 84/129; ES199601368 Supplement 001 F	
D3-HSM-8; 84/129; ES199601368 Supplement 001 F	

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.

ISFSI - HSM Welded Wire		
	Fabric Design Change 72.48 Log No.: St	
D3-HSM-8; 84/129;		
	ES199601368 Supplement 001 Revision 0000 Page	

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.

ISFSI - HSM Welded Wire Fabric Design Change 72.48 Log No.: SE0	
ISFSI - HSM Welded Wire Fabric Design Change 72.48 Log No.: SE0	
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D3-HSM-8; 84/129; ES199601368 Supplement 001 Revision 0000 Page 4	

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.

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)

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 Department: NED-CEU 42-01-04 Date: 1-7.97 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 / DATE SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE
Approved Disapproved Disapproved
Signature: Mehall, Sakaran INDEPENDENT REVIEWER Signature: Mehall, Sakaran Joc GS-DES, QS-TES, or PE-PDSU MICHAEL J. GAHAN JII
Date 11/13/97 Date 11-13-97
The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 97-/36 Date: 12-1-97
Recommend Recommend
Approval Disapproval Signature: Date
Approved Disapproved Signature: Date 12/4/57 Date 12/4/57
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes No
Signature: Date: 1/20/98 OSSRC SES CHAIRMAN
If you OSSBC Mooting No.

ISFSI - HSM 10CC46 Bar Rotation			
		72.48 Log No	
D3-HSM-9; 85/129; ES199601368			
	Supplement 001 Rev		
			age 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.

ISFSI - HSM 10CC46 Bar Rotation 72.48 Log No.: SE00088
ISFSI - HSM 10CC46 Bar Rotation 72.48 Log No.: SE00088
ISFSI - HSM 10CC46 Bar Rotation 72.48 Log No.: SE00088
ISFSI - HSM 10CC46 Bar Rotation 72.48 Log No.: SE00088
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ISFSI - HSM 10CC46 Bar Rotation 72.48 Log No.: SE00088
13FSF- HSM 100046 Bar Rotation 72:46 Edg No.: SE00066
131 31 - 11311 1000-0 Dat Notation
12.70 Log 10 0250000
D3-HSM-9; 85/129; ES199601368 Supplement 001 Revision 0000 Page 3 of 5
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.

SFSI - HSM 10CC46 Bar Rotation 72.48 Log No.: SE00088
SFSI - HSM 10CC46 Bar Rotation 72.48 Log No.: SE00088
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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.

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)

ISFSI - HSM 10CC47	Bar Splice Le	ngth			72.48 Log I	No.: SE00089
D3-HSM-10; 86/129;	ES199	601368 Su	pplement 00		on 0000	Page 1 of 5
Based on the attached disc	cussion, does this a		•			
Applicable to 10 CFR 50.5	-	•	ations			
NO	Involve an unrevi	ewed safety mes	tion (USO)?			
· -	Involve a change			License Conditi	ions or Bases	?
	Require a change					
Applicable to 10 CFR 72.4	48 Safety Evaluat	ions				
NO	Involve a Signific					
NO	Involve a Signific	ant Unreviewed	Environmental	Impact?		
Prepared by: <u>J. E. Remeni</u> PRINTEI	iuk O	TURE	Department	t: <u>NED-CEU 42</u>	2-01-04 Dat	e: <u>//·<i>7-97</i></u>
YES	Is a special review	w required by gro	oups other than	the group to wh	nich the Prepa	rer belongs?
Resp. Ind.: G. Tesfaye		Resp. Indv.: C.			Resp. Indv.: I	
Work Group: Licensin	ng	Work Group: 1	PES		Work Group:	NFM
Selachen Dolay & SIGNATURE / DATE	11/12/97	SIGNATURE	11/10/9 DATE	7 <i>I</i>	19/1/U SIGNATUR	11/11/97 E/DATE
Approved	Disapp	roved	Ap	proved	Disap	proved
Signature:	DENT REVIEWER	CARR	Signature: <u>//</u>	nufall	J. Sah S. GS-TES, or P	and
Date ///14/9	7		Date	CHAEL J		
The POSRC has reviewed	1 this evaluation a	ccording to NS-2	-101.			
POSRC Meeting No.:	97-136	•		12.1.97	7	
Recommend Rec	commend	,		<u></u>		
Approval Dis	sapproval	Signature	POSRCO	HAIRMAN	I	Date <u>12-1-57</u>
Approved	sapproved	Signature	: Pla	PERAL MANA		Date $\frac{12/4/57}{}$
The OSSRC has reviewed	d this evaluation a	ccording to NS-2	2-100.	Ó		
Full OSSRC Committee	review required?	Yes	No X	_		
Signature:	Manan S CHAIRMAN	Date: _/	1/30/98			
If yes OSSRC Meeting N	No · ·					

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.

ISFSI - HSM 10CC47 Bar Spli			
			Log No.: SE00089
D3-HSM-10; 86/129; E			
	S199601368 Supple	ment 001 Revision 00	000 Page 3 of 5

Complete for 50.59 and 72.48:

4.

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.

ISFSI - HSM 10CC47 Bar Splice		
	Length 72.48 Log No.: SE00089	
D3-HSM-10; 86/129; ES1	199601368 Supplement 001 Revision 0000 Page 4 of 5	
	199601368 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?

<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.

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.

ISFSI - HSM 10CC47 Bar Splice Length 72.48 Log No.: SE00089	
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	
D3-HSM-10; 86/129; ES199601368 Supplement 001 Revision 0000 Page 5 of 5	
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)

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: //-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 Work Group: PES Work Group: NFM SIGNATURE / DATE SIGNATURE
Approved Disapproved Disapproved
Signature: Malan M.A. CARR Signature: Mulharly Galardon Jongs DES ES TES, or PE-PDSU
Date 11/13/97 Date MICHAEL J. GAHANIII
The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 97-136 Date: 12-1-97
Recommend Approval Disapproval Signature Posrc CHAIRMAN Date 12-1-57
Approved Disapproved Signature: Date Date
The OSSRC has reviewed this evaluation according to NS-2-100.
Signature: Date: 1/50/98 OSSRC SES CHAIRMAN
If yes, OSSRC Meeting No.

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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.

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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.

ISFSI - HSM 10CC47 Bar Rotat	
	ion 72.48 Log No.: SE00090
D3-HSM-11; 87/129; ES	
	199601368 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?

<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.

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.

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)

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 Department: NED-CEU 42-01-04 Date: 1/-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 / DATE SIGNATURE / DATE SIGNATURE / DATE
Approved Disapproved Disapproved
Signature: Muhally Gahaman INDEPENDENT REVIEWER Signature: Muhally Gahaman Love Difference of PE-PDSU
Date
The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 97-136 Date: 12-1-97
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Recommend Recommend Disapproval Signature: Date 12-1-57
POSRC CHAIRMAN
Approved Disapproved Signature: Date \frac{12/\forall \frac{12}{\frac{1}{2}}}{PLANT GENERAL MANAGER}
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes No
Signature Date: 1/30/98 OSSRC SES CHAIRMAN
If yes, OSSRC Meeting No

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

SFSI - HSM 10CC46 Bar I			
			og No.: SE00091
D3-HSM-12; 88/129;	ES199601368		
		Supplement 001	

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.

ISFSI - HSM 10CC46 Bar			
			l8 Log No.: SE00091
D3-HSM-12; 88/129;	ES19960		
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			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.

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)

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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 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 / DATE / SIGNAPORE / DATE / SIGNAPORE / DATE / SIGNATURE / DATE			
Approved Disapproved Disapproved			
Signature: M. 4. CARA Signature: Muchauly. Jakaran FOGS-DES OS-TES, or PE-PDSU			
Date 11/13/97 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 Recommend			
Approval Disapproval Signature: Date /2-/-97 POSRC CHAIRMAN			
Approved Disapproved Signature: Date Date Date Date			
The OSSRC has reviewed this evaluation according to NS-2-100.			
Full OSSRC Committee review required? Yes No			
Signature: Date: 1/30/98 OSSEC SES CHAIRMAN			
If yes OSSRC Meeting No:			

ISFSI - HSM 10CC7 Bar Location Change	
	72.48 Log No.: SE00092
D3-HSM-13; 89/129; ES199601368 Supplement 001 Re	

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 - HSM 10CC7 Bar Location		
		No.: SE00092
D3-HSM-13; 89/129; ES19		
	9601368 Supplement 001 R	

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.

ISFSI - HSM 10CC7 Bar Location Ch	ange 72.48 Log No.: SE0009	
D3-HSM-13; 89/129; ES1996	01368 Supplement 001 Revision 0000 Page 4 of	

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.

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)

ISFSI - HSM 10007	Powell andth	70 49 L No - SE00002
iorai - nom 10001	Dower Length	72.48 Log No.: SE00093
D3-HSM-14; 90/129	9; ES199601368 Supplement 001 Revis	ion 0000 Page 1 of 5
Based on the attached di	liscussion, does this activity:	
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluations	
NO	Involve an unreviewed safety question (USQ)?	:::
NO NO	Involve a change in the Technical Specifications/License Condinates Require a change or addition to the UFSAR/USAR?	tions or Bases?
1.0	require a similar or available to the or or average.	
Applicable to 10 CFR 7	2.48 Safety Evaluations	
NO	Involve a Significant Increase in Occupational Dose?	
NO	Involve a Significant Unreviewed Environmental Impact?	
	0.16	_
Prepared by: J. E. Reme	reniuk Department: NED-CEU	42-01-04 Date: 11- 7-97
PRINI	ED NAME AND SIGNATURE	
YES	Is a special review required by groups other than the group to v	which the Preparer belongs?
Resp. Ind.: G. Tesfa Work Group: Licens		Resp. Indv.: R. H. Beall Work Group: NFM
work Group, Electric	ising Work Group. PES	work Group. NEW
hetach Soda.	15 1/10/00 PO/S/11/10/97 1	14 / 1 / 1/1/95
SIGNATURE / DATE		SIGNATURE / DATE
Approved	Disapproved (Approved)	Disapproved
Signature: Mai	Can m. A. CARR Signature: Muchael	D. Gaharan
	ENDENT REVIEWER +0 GS D	ES CS-TES, or PE-PDSU
Data 11/1	MICHAEL	J. CAHANIL
Date		
The POSRC has review	ved this evaluation according to NS-2-101.	
POSRC Meeting No.:_	97-136 Date: 12.1.97	7
	D	
	Recommend	D. 12-1-03
Approval I	Disapproval Signature: POSRC/CHAIRMAN	Date <u>/2-/-97</u>
) discontinuant	. /
Approved/ I	Disapproved Signature: PROH	Date 12/4/57
	PLANT GENERAL MAN	NAGER ///
The OSSRC has reviewed this evaluation according to NS-2-100.		
Full OSSRC Committee review required? Yes No ×		
i an oppic commuc	with required its its	
Signature: MR Almon Date: 1/30/98		
	SES CHAIRMAN	
•		
If yes, OSSRC Meeting	g No.: .:	

ISFSI - HSM 10CC7 Dowel Length	
	72.48 Log No.: SE00093
D3-HSM-14; 90/129; ES19:	9601368 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 - HSM 10CC7 Dowel Length	
	72.48 Log No.: SE00093
D3-HSM-14; 90/129; ES199601368 Supplement 001 Revi	
D3-HSM-14; 90/129; ES199601368 Supplement 001 Revi	sion 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.

ISFSI - HSM 10CC7 Dowel Length 72.48 Log No.: SE00	
ISFSI - HSM 10CC7 Dowel Length 72.48 Log No.: SE00	
D3-HSM-14; 90/129; ES199601368 Supplement 001 Revision 0000 Page 4 of	

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)

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		
Applicable to 10 CFR 30.37 and 10 CFR 72.46 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: 1/- 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		
150		
SIGNATURE / DATE SIGNATURE / DATE / SIGNATURE / DATE		
Approved Disapproved Disapproved		
Signature: MA, CARR Signature: Muhally, Galartin INDEPENDENT REVIEWER Signature: Muhally, Galartin		
Date 1/13/97 Date 11-13-97		
The POSRC has reviewed this evaluation according to NS-2-101.		
POSRC Meeting No.: 97-/36 Date: 12-/- 97		
Recommend Recommend		
Approval Disapproval Date Date Date Date		
Approved Disapproved Signature: PLANT GENERAL MANAGER Date 12/4/77		
The OSSRC has reviewed this evaluation according to NS-2-100.		
Full OSSRC Committee review required? Yes NoX		
Signature Date: 1/30/98 OSSRCSES CHAIRMAN		
If you OSSBC Mosting No		

ISFSI - HSM Roof 8CC13 Bar Replaceme	ent 72.48 Log No.: SE00094
D3-HSM-15; 91/129; ES19960136	
D3-HSM-15; 91/129; ES19960136	S8 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 - HSM Roof 8CC13 Bar Replacemen	it 72.48 Log No.: \$E00094
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.

ISFSI - HSM Roof 8CC13 Bar Replacement	
	72.48 Log No.: SE00094
D3-HSM-15; 91/129; ES199601368 Supplement 00	
)1 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.

ISFSI - HSM Roof 8CC13 Bar Re		g No.: SE00094
D3-HSM-15; 91/129; ES19	99601368 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)

	nal #7 Bars To Front Edge R	oof	72.48 Log No.: SE00095		
D3-HSM-16; 92/129	; ES199601368 Suj	oplement 001 Revis	sion 0000 Page 1 of 5		
Based on the attached dis	scussion, does this activity:				
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluat	<u>tions</u>			
NO	Involve an unreviewed safety questi	ion (USO)?	•		
NO	Involve a change in the Technical S		itions 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 O	ccupational Dose?			
NO	Involve a Significant Unreviewed E				
Prepared by: J. E. Remei	aint Oct 1	Denostment: NED CELL	42.01.04 Days // 7.07		
	ED NAME AND SIGNATURE	Department: NED-CEU	42-01-04 Date: 11-7-97		
YES	Is a special review required by grou	ups other than the group to v	which the Preparer belongs?		
Resp. Ind.: G. Tesfay	ye Resp. Indv.: C. I	J. Dobry	Resp. Indv.: R. H. Beall		
Work Group: Licens			Work Group: NFM		
14			MAS MILL		
SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE					
Approved	Disapproved	Approved	Disapproved		
Signature: Mala	m. A. CARR	Signature: Michael	J. Galaran		
INDEPEN	NDENT REVIEWER	Jor GS-D	SGS-TES, or PE-PDSU		
Date	3/97		3-97		
The POSRC has reviewed this evaluation according to NS-2-101.					
POSRC Meeting No.:	97-136	Date: 12 - 1 - 9	7		
Recommend Re	ecommend	0/			
	isapproval Signature:	the Ca	Date 12-1-97		
		POSRC CHAIRMAN			
Approved 1 Disapproved Signature: PLANT GENERAL MANAGER Date 12/1/57					
The OSSRC has reviewed this evaluation according to NS-2-100.					
Full OSSRC Committee review required? Yes No					
Signature: Date: 1/30/98 OSSRE SES CHAIRMAN					
If ves. OSSRC Meeting	No.: .:				

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 - HSM Additional #7 Bars T	
	o Front Edge Roof 72.48 Log No.: SE00095
D3-HSM-16; 92/129; ES19	
	9601368 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.

ISFSI - HSM Additional #7 Bars To Front Edge Roof	
	72.48 Log No.: SE00095
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	nent 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.

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)

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 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 Resp. Indv.: C. J. Dobry Resp. Indv.: R. H. Beall
Work Group: Licensing Work Group: PES Work Group: NFM
SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE
(Approved) Disapproved Approved Disapproved
Signature: M. A. CARR Signature: Multiple States of PE-PDSU INDEPENDENT REVIEWER Signature: Multiple States of PE-PDSU
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 Recommend
Approval Disapproval Signature: Date /-/ y-90
1010
Approved Disapproved Signature: Date // / Z Date // / Z
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes No
Signature: Date: 4/15/98 OSSRC SES CHARMAN
If yes, OSSRC Meeting No.: .:

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 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 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 - 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.

ISFSI - HSM Minimum Concrete Cover of Vertical O	Outlet Vent Rebar 72.48 Log No.: SE00096
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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.

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)

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?
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 October Department; NED-CEU 42-01-04 Date: //- 7- 97
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
Work Gloup. 125 Work Gloup. NYM
SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE
Approved Disapproved Disapproved
Signature: Malan M.A. CARR Signature: Multure Sharan Signature: Multure Signature Sign
Date 11/13/97 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 Recommend
Approval Disapproval Signature: Date /2-/-97
Approved Disapproved Signature: Date b/4/57 Date b/4/57
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes NoX
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN
If yes, OSSRC Meeting No.:

SFSI - HSM 10CC1				
				og No.: SE00097
3-HSM-18; 94/12 9): ES19960	plement 001 R	evision 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 - HSM 10CC1 Carriage Bar A		
		72.48 Log No.: SE00097
D3-HSM-18; 94/129; ES199		
D3-HSM-18; 94/129; ES199		
	801368 Supplement 001 Revisi	on 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.

ISFSI - HSM 10CC1 Carriage Bar				
				No.: SE00097
D3-HSM-18; 94/129; ES1	9960136			
		ment 001 Re	evision 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.

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)

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 Officer Department: NED-CEU 42-01-04 Date: 1/- 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 / DATE SIGNATURE / DATE SIGNATURE / DATE			
Approved Disapproved Disapproved			
Signature: M.A. CARC Signature: Muhaul J. Jahanan INDEPENDENT REVIEWER Signature: Muhaul J. Jahanan HICHAEL J. GAHAN III			
Date 11/13/97 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 Disapproval Signature: POSRC CHAIRMAN Date 12-1-97			
Approved Disapproved Signature: Date			
The OSSRC has reviewed this evaluation according to NS-2-100.			
Signature: Date: 130/58			
If yes, OSSRC Meeting No.:			

	7 Bar Dimensional C	Changes 72.48 Log No.: SE00098
D3-HSM-19; 95/12	9; ES199601	
		368 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 - HSM 10CC7 Bar Dimensional Changes 72.48 Log No.: SE0009	
ISFSI - HSM 10CC7 Bar Dimensional Changes 72.48 Log No.: SE0009	
D3-HSM-19; 95/129; ES199601368 Supplement 001 Revision 0000 Page 3 of	
D3-HSM-19; 95/129; ES199601368 Supplement 001 Revision 0000 Page 3 of	

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 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:

ISFSI - HSM 10CC7 Bar Dimensional	Changes 72.48 Log No.: SE00098
D3-HSM-19; 95/129; ES19960	
	1368 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?

<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.

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.

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)

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 at timeviewed safety question (05Q)? 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?
0.10
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 Resp. Indv.: C. J. Dobry Resp. Indv.: R. H. Beall
Work Group: Licensing Work Group: PES Work Group: NFM
katarhan Salmusta worder 11/1/67
SIGNATURE DATE SIGNATURE DATE SIGNATURE DATE
Approved Approved Disapproved
Signature: Malan M. 4. CARR Signature: Muhally. Sahman
Signature: M. A. CARR Signature: Muhauf. Salama INDEPENDENT REVIEWER Signature: Muhauf. Salama MICHAEL . CAHAIIII
. / 2 / 2 -
Date $1/(13/97)$ Date $11-14-97$
The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 97-/36 Date: 12.1.97
POSRC Meeting No
Recommend Recommend
Approval Disapproval Signature: Date /2-/-57
POSRC CHAIRMAN
Approved V Disapproved Signature: 12/4/57
PLANT GENERAL MANAGER
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes No X
Signatura OD La Company 1/2- /ac/
Signature: 978 Date: 1/30/98 OSSRC SES CHAIRMAN
If yes, OSSDC Meeting No.

ISFSI - HSM Additional Reinforcing Steel	72.48 Log No.: SE00099
D3-HSM-20; 96/129; ES199601368 Supplement 0	01 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, 4, 3.6, 4.2, 4.3, 5.1, 7.3, 7.4, 8.1, 8.2, and Appendix A - Drawings.

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:

ISFSI - HSM Additional Reinforcing Steel 72.4	8 Log No.: SE00099
D3-HSM-20; 96/129; ES199601368 Supplement 001 Revision 0	

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.

ISFSI - HSM Additional Reinforcing Steel	
	72.48 Log No.: SE00099
D3-HSM-20; 96/129; ES199601368 Supplemen	it 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)

ISFSI - HSM Reinforcing	g Steel Installation		72.48 Log No.: SE00100
D3-HSM-21; 97/129;	ES199601368 Sup	plement 001 Rev	ision 0000 Page 1 of 5
	•	4	
Based on the attached discussi	•		
Applicable to 10 CFR 50.59 a	and 10 CFR 72.48 Safety Evaluat	ions	
	volve an unreviewed safety questi		
	volve a change in the Technical S quire a change or addition to the		ditions or Bases?
		OI DINO ODINC:	
Applicable to 10 CFR 72.48	Safety Evaluations		
	volve a Significant Increase in Oc		
NO Inv	volve a Significant Unreviewed E	Invironmental Impact?	
Prepared by: J. E. Remeniuk		Department: <u>NED-CEU</u>	J 42-01-04 Date: 11-7-97
PRINTED NA	ME AND SIGNATURE		
YES Is a	a special review required by grou	ips other than the group to	which the Preparer belongs?
Resp. Ind.: G. Tesfaye	Resp. Indv.: C. J	•	Resp. Indv.: R. H. Beall
Work Group: Licensing	Work Group: PE	ES /	Work Group: NFM
SIGNATURE / DATE	e/97 SIGNATURE / I	11/10/97 G	SIGNATURE/DATE
Approved	Disapproved	Approved	Disapproved
Signature: Malau INDEPENDEN	m. A CARR	Signature: Muhu	l & Gahana
Date///3	1		DESCSTES, OF PEPDSU L J. GAHAWIII 13-97
The POSRC has reviewed thi	is evaluation according to NS-2-1	101.	•
	7-136	Date: /2./	97
Recommend Recom	nmend		
Approval Disapp	,	POSRC, CHAIRMAN	Date 12-1-37
Approved Disapp	proved Signature:	PLANT GENERAL MA	Date 17/97
The OSSRC has reviewed thi	is evaluation according to NS-2-	100.	
Full OSSRC Committee device	ew required? Yes	No_X	
Signature: OSSRC SES CI	Date: //	30/98	
If ves OSSRC Meeting No.			

ISFSI - HSM Reinforcing Steel Installa	ation 72.48 Log No.: SE00100
D3-HSM-21; 97/129; ES19960	
	1368 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.

ISFSI - HSM Reinforcing Steel Installation 72.4	
	8 Log No.: SE00100
D3-HSM-21; 97/129; ES199601368 Supplement 001 Revision 0	000 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:

ISFSI - HSM Reinforcing Steel		
		72.48 Log No.: SE00100
D3-HSM-21; 97/129; ES	99601368 Supplement 001 Revisi	
		on 0000 Page 4 of 5
	99601368 Supplement 001 Revisi	

- 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.

ISFSI - HSM Reinforcing Steel Installation 72.48 Log No.: SE	
ISFSI - HSM Reinforcing Steel Installation 72:48 Log No.: SE	
D3-HSM-21; 97/129; ES199601368 Supplement 001 Revision 0000 Page 5	
D3-HSM-21; 97/129; ES199601368 Supplement 001 Revision 0000 Page !	

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)

ISFSI - HSM #8 Bar Ad	ded For Crack Control		72,48 Log No.: SE00101	
D3-HSM-22; 98/129;	ES199601368 Supple	ement 001 Revis	ion 0000 Page 1 of 5	
Based on the attached discus	ssion, does this activity:			
Applicable to 10 CFR 50,59	and 10 CFR 72.48 Safety Evaluation	<u>s</u>		
NO I	nvolve an unreviewed safety question	(USO)?		
NO I	avolve a change in the Technical Spec	cifications/License Condi	tions or Bases?	
NO R	equire a change or addition to the UF	SAR/USAR?		
Applicable to 10 CFR 72.48	Safety Evaluations			
	nvolve a Significant Increase in Occup			
NO I	nvolve a Significant Unreviewed Envi	ronmental Impact?		
Prepared by: J. E. Remeniul	RINTED NAME AND SIGNATURE	Department: <u>NED-CEU 4</u>	12-01-04 Date: //· 7-97	
YES I	s a special review required by groups	other than the group to w	hich the Preparer belongs?	
Resp. Ind.: G. Tesfaye	Resp. Indv.: C. J. D	obry	Resp. Indv.: R. H. Beall	
Work Group: Licensing	Work Group: PES	,	Work Group: NFM	
Machen Jedans & Signature / Date	signature / Dat	1/10/97	SIGNATURE / DATE	
Approved	Disapproved	Approved	Disapproved	
Signature: <u>Malan</u> INDEPENDE	M. A. CARR Signt Reviewer	gnature: Muhael	ESGSTES, OF PE-PDSU J. GAHA-JUL	
Date	1 <u>3/97</u> Da		13-97	
The POSRC has reviewed t	his evaluation according to NS-2-101			
POSRC Meeting No.:	9 <i>7-136</i> Da	ate: <u>/2 · / · 9 7</u>	7	
Recommend Reco	mmend	1		
Approval Disa	pproval Signature	POSRC CHAIRMAN	Date /2-/-17	
Approved Disa	pproved Signature:	PLANT GENERAL MAN	Date 12/4/57	
The OSSRC has reviewed t	his evaluation according to NS-2-100).		
Full OSSRC Committee review required? Yes NoX				
Signature: OSSRĈ SES	CHAIRMAN Date: 1/3.	0/98		
If ves OSSRC Meeting No				

ISFSI - HSM #8 Bar Added For Crack Control 72.48 Log No.: SE00	
ISFSI - HSM #8 Bar Added For Crack Control 72.48 Log No.: SE00	
D3-HSM-22; 98/129; ES199601368 Supplement 001 Revision 0000 Page 2 0	
D3-HSM-22; 98/129; ES199601368 Supplement 001 Revision 0000 Page 2 of	

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.

ISFSI - HSM #8 Bar Added For Crack Control 72.48 Log No.: SE00	
ISFSI - HSM #8 Bar Added For Crack Control 72.48 Log No.: SE00	
D3-HSM-22; 98/129; ES199601368 Supplement 001 Revision 0000 Page 3 o	
D3-HSM-22; 98/129; ES199601368 Supplement 001 Revision 0000 Page 3 o	
D3-HSM-22; 98/129; ES199601368 Supplement 001 Revision 0000 Page 3 o	

Complete for 50.59 and 72.48:

 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:

ISFSI - HSM #8 Bar Added For Crack Control	
	72.48 Log No.: SE00101
D3-HSM-22; 98/129; ES199601368 Su	ipplement 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.

ISFSI - HSM #8 Bar Added For Crae	
	ck Control 72.48 Log No.: SE00101
D3-HSM-22; 98/129; ES199	601368 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)

ISESI - HSM 5CC69 F	Bars Added For Crack C	ontrol	72 AR I	og No.: SE00102
lor or - riom added t	July Added t of Order O	ond of	12.40.	zog non ozoroz
D3-HSM-23; 99/129;	ES199601368	Supplement 001	Revision 000	O Page 1 of 5
Based on the attached disc	cussion, does this activity:			
	59 and 10 CFR 72.48 Safety E	valuations		
NO	Involve an unreviewed safety			30
NO NO	Involve a change in the Techn Require a change or addition	•	se Conditions or I	Bases?
110	reduite a cimile of manifoli	to the OI bride obtain		
Applicable to 10 CFR 72.4	48 Safety Evaluations			
NO	Involve a Significant Increase	in Occupational Dose?		
NO	Involve a Significant Unrevie		ict?	
Prepared by: J. E. Remeni	ink Ord	Denartment: NF	D_CEII 42_01_04	Date: //- 7- 97
	D NAME AND SIGNATURE	Department:_11L	D-CDC 42-01-04	_ Date
YES	Is a special review required by	y groups other than the g	roup to which the	Preparer belongs?
Deep Ind. C. Tesfer	Dom Tolk	C. I. Dahan	Dam I	ndv.: R. H. Beall
Resp. Ind.: G. Tesfaye Work Group: Licensin		:: C. J. Dobry up: PES		roup: NFM
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SIGNATURE / DATE	11/12/97 SIGNAT	(1/10/97 URE/DATE	UKX!	ATURE/DATE
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Approved	Disapproved	Approve	2d)	Disapproved
Signature: Malan	a Acter	Signature: Mu	hall a	Yoh into
	DENT REVIEWER		Orgs des, es te	S, or PE-PDSU
Date ////	12/97	Date	11-13-9	THAN III
The POSRC has reviewed	d this evaluation according to 1	NS-2-101.		
POSRC Meeting No.:	97-136	Date:	.1.97	
Recommend / Re	commend			
	sapproval Signa	iture:	le	Date
		POSRC CHAIL	RMAN	. /
Approved V Di	sapproved Signa	ature:		Date 12/4/57
			AL MANAGER	<u> </u>
The OSSRC has reviewed	d this evaluation according to	NS-2-100.		
Full OSSRC Committee	reylew required? Yes	NoX		
Signature: M. Lemon Date: 1/30/98				
Signature: OSSAC SE	ES CHAIRMAN Dat	E		
If yes, OSSRC Meeting ?	No.:			

ISFSI - HSM 5CC69 Bars Added For Crack Control	
	72.48 Log No.: SE00102
D3-HSM-23; 99/129; ES199601368 Supplement 00	
)1 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.

ISFSI - HSM 5CC69 Bars Added For Crack Control 72.48 Log No.: 9	
ISFSI - HSM 5CC69 Bars Added For Crack Control 72.48 Log No.: 9	
D3-HSM-23; 99/129; ES199601368 Supplement 001 Revision 0000 Pag	
D3-HSM-23; 99/129; ES199601368 Supplement 001 Revision 0000 Pag	

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:

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.

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)

ISFSI - HSM 7CC64	Through 7CC68 Bar Locat	ions Clarification	72.48 Log No.: SE00103	
D3-HSM-24; 100/12	29; ES199601368 S	Supplement 001 Rev	rision 0000 Page 1 of 5	
Based on the attached di	iscussion, does this activity:			
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Eval	uations		
NO NO	Involve an unreviewed safety qu Involve a change in the Technic	1 1	nditions or Bosse?	
NO	Require a change or addition to		iditions of bases?	
Applicable to 10 CFR 7	2.48 Safety Evaluations			
NO NO	Involve a Significant Increase in Involve a Significant Unreviewe			
Prepared by: <u>J. E. Reme</u>	eniuk O O O O O O O O O O O O O O O O O O O	Department: <u>NED-CE</u>	U 42-01-04 Date: //. 7. 9.7	
YES	Is a special review required by g	croups other than the group to	o which the Preparer belongs?	
Resp. Ind.: G. Tesfa Work Group: Licens			Resp. Indv.: R. H. Beall Work Group: NFM	
Setachenderfry SIGNATURE / DATE	106 11/12/97 /// SIGNATUR	1/10/47 W	SIGNATURE / DATE	
Approved	Disapproved	Approved	Disapproved	
Signature: MaC	M. A. CARRE	Signature: Muhu	LJ. GARANGN DES OS-TES, OF PE-PDSU	
Date//	113/97	Date MICHAEL	J. GAHÁNJII -13-97	
The POSRC has review	ed this evaluation according to NS	-2-101.		
POSRC Meeting No.:_	97-136	Date:	7	
	Recommend Disapproval Signatu	re: POSRC CHAIRMAN	Date <u>/2-/-57</u>	
Approved Disapproved Signature: Date Date Date				
The OSSRC has reviewed this evaluation according to NS-2-100.				
Full OSSRC Committee review required? Yes NoX				
Signature: Date: 1/30/98 OSSEC SES CHAIRMAN				
If yes, OSSRC Meeting	g No.:			

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.

		Clarification		
			72.48 Log No.: S	
SM-24; 100 <i>i</i>		lement 001 R	evision 0000 Page	

Complete for 50,59 and 72,48:

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:

ISFSI - HSM 7CC64 Through 7CC68 Bar Locations Clarificat	ion 72.48 Log No.: SE00103
D3-HSM-24; 100/129; ES199601368 Supplement 00	1 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.

	gh 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)

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 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				
Setachen Jester 1/11/27 SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE				
Approved Disapproved Disapproved				
Signature: Malan M. A. CARR Signature: Muhall J. Sahawa Forgs Designature Michael J. Cahaan Michael Michae				
Date				
The POSRC has reviewed this evaluation according to NS-2-101.				
POSRC Meeting No.: 97-136 Date: 12.1.97				
Recommend Approval Disapproval Signature: Date /2-/-17 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 regiew required? Yes NoX				
Signature: Strand Date: 1/30/98 OSSRC SES CHAIRMAN				
If was OSSBC Meeting No:				

ISFSI - HSM 8CC13 Bar Clearance Distance Change 72.48 Log No.: SE00104
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
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.

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			og No.: SE00104
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			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:

ISFSI - HSM 8CC13 Bar Clearar		
	je 72.48 Log No.: SE	
D3-HSM-25; 101/129; ES		
	lement 001 Revision 0000 Page	

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.

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)

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ISFSI - HSM 6CC55	Through 10CC55	Bar Size Change		72.48 Log No	o.: SE00105
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Based on the attached dis	scussion, does this acti	vity:			
Applicable to 10 CFR 50	.59 and 10 CFR 72.48	Safety Evaluations			
NO	Involve an unreview	ed safety question (US	O) 2		
NO		the Technical Specification		litions or Bases?	
NO		addition to the UFSAF		ittolis vi basos.	
Applicable to 10 CFR 72	2.48 Safety Evaluation	<u>s</u>			
NO	Involve a Significant	t Increase in Occupation	onal Dose?		
NO		t Unreviewed Environi			
Prepared by: J. E. Remer	nink Och	Dens	rtment: <u>NED-CEU</u>	42-01-04 Date:	11.7.97
	PRINTED NAME AND	SIGNATURE		<u> </u>	7-7-7-8
YES	Is a special review re	equired by groups othe	r than the group to	which the Prepare	r belongs?
Resp. Ind.: G. Tesfay		esp. Indv.: C. J. Dobry	, , , , , , , , , , , , , , , , , , , ,	Resp. Indv.: R.	
Work Group: Licens	ing V	Vork Group: PES		Work Group: N	FM
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Approved	Disapprov	red	Approved	Disappr	oved
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Signature: JA. CRUNKLE INDEPER	NON JA Cunk	Signati	ure: Muhail	ME ESTES OF DE	eneri
,			MICHAEL	CAHAN	III.
Date	197	Date _	11-	-13-97	
The POSRC has reviewed this evaluation according to NS-2-101.					
POSRC Meeting No.:	97-137	Date: _	12.3.5	7	
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Approval D	isapproval	Signature.	SRC CHAIRMAN	Dat	e /2-3-87
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Approved D	isapproved	Signature:	NT GENERAL MAI		e 12-3-97
		// PLA	NI GENERAL MAI	NAGER	
The OSSRC has reviewed this evaluation according to NS-2-100.					
Full OSSRC Committee review required? Yes No					
Signature:	ES CHAIRMAN	Date: _//30/	78		
If yes, OSSRC Meeting	No.:				

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ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 6CC55 Through 100	CC55 Bar Size Change 72.48 Log No.: SE00105
D3-HSM-26; 102/129; ES1	99601368 Supplement 001 Revision 0000 Page 2 of 5
	99601368 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.

ISFSI - HSM 6CC55 Through 10CC5		
		72.48 Log No.: SE00105
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	01368 Supplement 001 Rev	ision 0000 Page 3 of 5

Complete for 50.59 and 72.48:

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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:

ISFSI - HSM 6CC55 Through 10CC5			
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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:

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)

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		ations		
Applicable to 10 CFR 3	0.59 and 10 CFR 72,48 Safety Evalu	auous		
NO	Involve an unreviewed safety que	stion (USQ)?		
NO	Involve a change in the Technical		Conditions or Bases?	
NO	Require a change or addition to the	ne UFSAR/USAR?		
Ameliachia to 10 CFD 7	12 49 Sofety Evaluations			
Applicable to 10 CFR /	2.48 Safety Evaluations			
NO	Involve a Significant Increase in	Occupational Dose?		
NO	Involve a Significant Unreviewed	Environmental Impact?		
Description I E Dem	aminute Or CA	Department: NFD-C	CEU 42-01-04 Date: 11. 7. 97	
Prepared by: J. E. Remo	PRINTED NAME AND SIGNATURE	Department	500 42 01 04 Butt.	
YES	Is a special review required by gr	oups other than the group	to which the Preparer belongs?	
Resp. Ind.: G. Tesf	aye Resp. Indv.: C	` I Dohry	Resp. Indv.; R. H. Beall	
Work Group: Licer	•		Work Group: NFM	
Work Group: Elect	iong ,		Allo ale II	
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(Approved)	Disapproved	Approved	Disapproved	
Simulation II Can in	1 11 P. W. L. 1	Signature: Muh	all O Sta Rancia	
Signature: VA CZOWE	ETEN JA Crumbleton J. ENDENT REVIEWER	for	GS DEF GS-TES, or PE-PDSU	
	•	MICHA	ELJ. GAHANJIL	
Date	/97	Date	11-13-97	
The POSRC has review	wed this evaluation according to NS-	2-101.		
		Date: 12 - 3	2.97	
FOSKC Meeting No	31-131	2.10		
Recommend	Recommend	0///	//- 12282	
Approval	Disapproval Signatur		Date /2-3-97	
		POSRC CHAIRM	AN (
Approved	Disapproved Signatur	re()//	Date 12-3-87	
Approved	Disupprovou	PLANT GENERAL	MANAGER	
The OSSRC has revie	wed this evaluation according to NS	-2-100.		
Full OSSRC Committ	tee review required? Yes	No X		
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Signature:	SES CHAIRMAN	1150110		
<i>possile</i>				
If ves, OSSRC Meetin	ng No ·			

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ISFSI - HSM Bars 9CC34 & 10CC55 Deleted 72.48 Log No.: S	
D3-HSM-27: 103/129: ES199601368 Supplement 001 Revision 0000 Pag	
D3-HSM-27; 103/129; ES199601368 Supplement 001 Revision 0000 Pag	e 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.

ISFSI - HSM Bars 9CC34 & 10CC55 Deleted 72.48 Log	
	No.: SE00106
D3-HSM-27; 103/129; ES199601368 Supplement 001 Revision 0000	
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.

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ISFSI - HSM Bars 9CC34 & 10CC55 Deleted 72.48 Log No.: SE00106
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D3-HSM-27; 103/129; ES199601368 Supplement 001 Revision 0000 Page 4 of 5
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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:

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)

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 Department: NED-CEU 42-01-04 Date: //. 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 Work Group: NFM			
SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE			
Approved Approved Disapproved			
Signature: JA Crunkleton JA Crumbleton J Signature: Muhael J. Saharan INDEPENDENT REVIEWER Signature: Michael J. Saharan MICHAEL J. SAHAN JIII			
Date 11/12/97 Date 11-13-97			
The POSRC has reviewed this evaluation according to NS-2-101.			
POSRC Meeting No.: 97-/37 Date: 12-3-97			
Recommend Recommend Disapproval Signature: POSRC CHAIRMAN Date 12-3-17			
Approved Disapproved Signature: PLANT GENERAL MANAGER Date 12-3-87			
The OSSRC has reviewed this evaluation according to NS-2-100.			
Full OSSRC Committee review required? Yes NoX Signature: Date: //30/98			
OSSRC SES CHAIRMAN If yes, OSSRC Meeting No.			

ISFSI - HSM 9CC31 Bar Quantity Change 72.48 Log No.: SE00	
D3-HSM-28; 104/129; ES199601368 Supplement 001 Revision 0000 Page 2 of	

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.

ISFSI - HSM 9CC31 Bar Quantity Change 72.48 Log No.	
ISFSI - HSM 9CC31 Bar Quantity Change 72.48 Log No.	
D3-HSM-28; 104/129; ES199601368 Supplement 001 Revision 0000 P	
D3-HSM-28; 104/129; ES199601368 Supplement 001 Revision 0000 P	

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.

ISFSI - HSM 9CC31 Bar Quantity		
	72.48 Log No.: SE	
D3-HSM-28; 104/129; ES19		
	11 Revision 0000 Page	

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:

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)

ISFSI - HSM 9CC32	To 6CC32 Bar Size Change	72.48 Log No.: SE00108
D3-HSM-29; 105/12	9; ES199601368 Supplement 001	Revision 0000 Page 1 of 5
Based on the attached di	iscussion, does this activity:	
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluations	
NO	Involve an unreviewed safety question (USQ)?	
NO NO	Involve a change in the Technical Specifications/Li	
NO	Require a change or addition to the UFSAR/USAR?	
Applicable to 10 CFR 72	2.48 Safety Evaluations	
NO	Involve a Significant Increase in Occupational Dose	e?
МО	Involve a Significant Unreviewed Environmental Ir	npact?
Prepared by: J. E. Reme		NED-CEU 42-01-04 Date: //- 7- 97
	PRINTED NAME AND SIGNATURE	
YES	Is a special review required by groups other than th	e group to which the Preparer belongs?
Resp. Ind.: G. Tesfa	· · · · · · · · · · · · · · · · · · ·	Resp. Indv.: R. H. Beall
Work Group: Licens	sing Work Group: PES	Work Group: NFM
Setachon Desput	SIGNATURE / DATE	7 JH JULI 11/11/9-
Approved	Disapproved Appr	roved Disapproved
INDEPE	KIFTOW JA Cruelletenf Signature: MENDENT REVIEWER	JOHGS-DES, OS PE-PDSU CHAEL J. GAHANAIT
	MI	11-13-97
The POSRC has review	ved this evaluation according to NS-2-101.	
POSRC Meeting No.:_		2.3.97
TOOKE Wiccing No		
	Recommend Disapproval Signature:	Date 12-3-57
Approvai	POSRC CH	AIRMAN
Approved // I	Disapproved Signature:	Date 12-3-87
		ERAL MANAGER
The OSSRC has reviewed this evaluation according to NS-2-100.		
Full OSSRC Committee review required? Yes No		
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN		
If yes, OSSRC Meeting	z No.:	

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.

ISFSI - HSM 9CC32 To 6CC32 Bar Size Change	72.48 Log No.: SE00108
D3-HSM-29; 105/129;	
D3-HSM-29; 105/129; ES199601368 S	
	upplement 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.

ISFSI - HSM 9CC32 To 6CC32 Bar Size Change	
	72.48 Log No.: SE00108
D3-HSM-29; 105/129; ES199601368 Supp	
	plement 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?

<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.

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:

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)

ISFSI - HSM 9CC33	To 6CC33 Bar Size Chang	e	72.48 Log No.: SE00109
D3-HSM-30; 106/129	e; ES199601368 S	Supplement 001 Re	vision 0000 Page 1 of 5
Based on the attached dis	cussion, does this activity:		
Applicable to 10 CFR 50	.59 and 10 CFR 72.48 Safety Eva	<u>luations</u>	
NO	Involve an unreviewed safety qu		
N О	Involve a change in the Technic Require a change or addition to	•	onditions or Bases?
Applicable to 10 CFR 72	.48 Safety Evaluations		
NO	Involve a Significant Increase in		
МО	Involve a Significant Unreview	ed Environmental Impact?	
Prepared by: J. E. Remer	niuk A CA CA PRINTED NAME AND SIGNATURE	Department: NED-C	EU 42-01-04 Date: //- 7-97
YES	Is a special review required by a	groups other than the group	to which the Preparer belongs?
Resp. Ind.: G. Tesfay Work Group: Licens		<u> </u>	Resp. Indv.: R. H. Beall Work Group: NFM
SIGNATURE / DATE	(1/12/92	(1/10/27 GE/DATE	MANGUL 11/11/97) SIGNATURE / DATE
Approved	Disapproved	Approved	Disapproved
Signature: J.A. CRUNKL INDEPEN	ETON JA Cunkletaj NDENT REVIEWER	Signature: Muha	GS-DES/GS-TES, or PE-PDSU
Date	97	Date	11-13-97
The POSRC has reviewe	ed this evaluation according to NS	3-2-101.	
POSRC Meeting No.:	97-/37	Date:	.97
	ecommend isapproval Signatu	POSRC CHAIRMA	Date/23-97
Approved D	sisapproved Signati	PLANT GENERAL	Date 12-3-17 MANAGER
The OSSRC has reviewe	ed this evaluation according to NS	S-2-100.	
Full OSSRC Committee	review required? Yes	No X	
Signature: OSSRe's	Schairman Date:	1/30/98	
If ves. OSSRC Meeting	No.:		

72.48 Log No.: SE00109
1 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.

ISFSI - HSM 9CC33 To 6CC33 Bar Size	e Change 72.48 Log No.: SE00109
D3-HSM-30; 106/129; ES199601	
D3-HSM-30; 106/129; ES199601	368 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.

	72.48 Log No.: SE00109
ISFSI - HSM 9CC33 To 6CC33 Bar Size Change	
D3-HSM-30; 106/129; ES199601368 Supplement 001 Rev	
D3-HSM-30; 106/129; ES199601368 Supplement 001 Rev	
	ision 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:

ISFSI - HSM 9CC33 To 6CC33 Bar Size Change	72.48 Log No.: SE00109
D3-HSM-30; 106/129; ES199601368 Sup	plement 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)

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 Column 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 Resp. Indv.: C. J. Dobry Resp. Indv.: R. H. Beall
Work Group: Licensing Work Group: PES Work Group: NFM
SIGNATURE / DATE SIGNATURE / DATE SIGNATURE / DATE
Approved Disapproved Disapproved
Signature: <u>J.A. Crunkletan</u> Signature: <u>Muhully</u> , <u>Haharan</u> INDEPENDENT REVIEWER Signature: <u>Muhully</u> , <u>Haharan</u> For GS DES, CS-TES, or PE-PDSU
Date MICHAEL J. GAHANIII Date 11-13-97
The POSRC has reviewed this evaluation according to NS-2-101.
POSRC Meeting No.: 97-/37 Date: 12-3-97
Recommend Approval Disapproval Signature: POSRC CHAIRMAN Date 12-3-87
Approved Disapproved Signature Date \(\frac{12-3-17}{PLANT GENERAL MANAGER} \)
The OSSRC has reviewed this evaluation according to NS-2-100.
Full OSSRC Committee review required? Yes NoX
Signature: Date: 1/30/98 OSSRC SES CHAIRMAN
If ves OSSRC Meeting No :

ISFSI - HSM 10CC37 Length		
		72.48 Log No.: SE00110
	E\$199601368	
D3-HSM-31; 107/129;		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.

ISFSI - HSM 10CC37 Length Change	
	72.48 Log No.: SE00110
D3-HSM-31; 107/129; ES199601368 Supplement 001	
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.

ISFSI - HSM 10CC37 Length Chan	
	72.48 Log No.: SE00110
D3-HSM-31; 107/129; ES199	
	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:

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 (USO)
- 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)

ISFSI - HSM 10CC38	Length Change				72.48 ±09	No.: SE00111
D3-HSM-32; 108/129;	ES19960°	1200 Cum		M. Daviet	0000	D4-65
150-15M1-027 10011725	-518560	1900 Sup	plement 00	// Revisi	on 0000	Page 1 of 5
Based on the attached discre	ussion, does this activ	vity:				
Applicable to 10 CFR 50.5	9 and 10 CFR 72.48	Safety Evaluati	<u>ions</u>			
NO	Involve an unreviewe	ed safety anestic	on (USO)?			
	Involve a change in t	the Technical S	pecifications/	License Conditi	ons or Base	s?
NO	Require a change or	addition to the	UFSAR/USA	R?		
Applicable to 10 CFR 72.4	8 Safety Evaluations	<u>s</u>				
NO	Involve a Significant	Increase in Oc	cupational Do	ose?		
	Involve a Significant					
Prepared by: J. E. Remeniu	1k 90/15	\geq	Departmen	t: NED-CEU 42	2-01-04 D	ate: 11.7-97
•	PRINTED NAME AND	SIGNATURE				
YES	Is a special review re	equired by group	ps other than	the group to wh	ich the Prep	parer belongs?
Resp. Ind.: G. Tesfaye		esp. Indy.: C. J.]	Resp. Indv.:	R. H. Beall
Work Group: Licensin	g V	Vork Group: PE	ES 7	•	Work Group	p: NFM
Machan Deslay 18 SIGNATURE DATE	Tupelas _	SIGNATURE / D	////0/9- DATE	z W	SIGNATU	<u> </u>
Approved	Disapprove	ed	Ap	proved	Dis	approved
Signature: J.A. CRUNKL INDEPEND	ETON JA Crum ENT REVIEWER	Soletons	Signature.	for GS-DES	J. Ha	Langu PE-PDSU
/	./47			MICHAEL 11-13	J. GAHA	
The POSRC has reviewed	this evaluation accor	ding to NS-2-1	01.			
POSRC Meeting No.:		Ü		12-3-97	7	
Recommend Reco	ommend			_		
_	approval	Signature:	POSRC C	HAIRMAN		Date <u>12-3-87</u>
Approved Disc	approved	Signature:	DI ANT CE	MEDAL MANA		Date 12-3-87
			PLANT GE	ENERAL MANA	GEK	
The OSSRC has reviewed		•	100.			
Full OSSRC Committee re	evjew required? Ye	es	No_X			
Signature: OSSRe SES	<i>Enioni</i> CHAIRMAN	Date: //:	30/98			
If yes OSSPC Meeting Me						

	Length Change		_og No.: SE00111
ISM-32: 108/129		nt 001 Revision 000	

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.

ISFSI - HSM 10CC38 Length Change 72.48 Log No.: SE001	
ISFSI - HSM 10CC38 Length Change 72.48 Log No.: SE001	
D3-HSM-32; 108/129; ES199601368 Supplement 001 Revision 0000 Page 3 of	
D3-HSM-32; 108/129; ES199601368 Supplement 001 Revision 0000 Page 3 of	

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.

ISFSI - HSM 10CC38 Length Change	72.48 Log No.: SE00111
D3-HSM-32; 108/129; ES199601368 Supplement 001 Rev	
D3-HSM-32; 108/129; ES199601368 Supplement 001 Rev	

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:

- 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:

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)

ISFSI - HSM 10CC39 L	ength Change	72.48 Log No.: SE00112
D3-HSM-33; 109/129;	ES199601368 Supplement 001 Revisi	on 0000 Page 1 of 5
Based on the attached discus	ssion, does this activity:	
Applicable to 10 CFR 50.59	and 10 CFR 72.48 Safety Evaluations	
NO In	nvolve an unreviewed safety question (USQ)?	
NO In	nvolve a change in the Technical Specifications/License Condition	tions or Bases?
NO R	equire a change or addition to the UFSAR/USAR?	
Applicable to 10 CFR 72.48	Safety Evaluations	
NO In	nvolve a Significant Increase in Occupational Dose?	
NO Ir	nvolve a Significant Unreviewed Environmental Impact?	
Prepared by: J. E. Remeniuk		2-01-04 Date: 11.7-97
Pé	KINTED NAME AND SIGNATURE	
YES Is	s a special review required by groups other than the group to w	hich the Preparer belongs?
Resp. Ind.: G. Tesfaye	Resp. Indv.: C. J. Dobry	Resp. Indv.: R. H. Beall Work Group: NFM
Work Group: Licensing	Work Group: PES	WORK GROUP: NEM
Solven Johnston Signature / Date	11/12/97 // SIGNATURE / DATE	SIGNATURE / DATE
(Approved)	Disapproved Approved	Disapproved
Signatura: TA Cauly or	TON JA Cumpleton & Signature Michael	O. Halingo
Signature: T.A. LRUNKLE? INDEPENDE		S. GS-TES, or PE-PDSU C.J. C-AHANIII
Date		3-97
The POSRC has reviewed the	his evaluation according to NS-2-101.	
	$97-/37$ Date: $12\cdot 3\cdot 9$	7
	_	
	ommend pproval Signature:	Date 12-3-57
	POSRC CHAIRMAN	
Approved / Disag	pproved Signature:	Date 12-3-92
	PLANT GENERAL MAN	
The OSSRC has reviewed to	this evaluation according to NS-2-100.	
Full OSSRC Committee rev	yjew required? Yes No X	
Signature: OSSRC SES	CHAIRMAN Date: 1/30/95	
If yes, OSSRC Meeting No.	ı.:	

ISFSI - HSM 10CC39 Length		72.48 Log No.: SE00112
D3-HSM-33; 109/129;	ES199601368 Supplement 001 Re	

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.

ISFSI - HSM 10CC39 Length Change	72.48 Log No.: SE00112
D3-HSM-33; 109/129; ES199601368 Si	
	upplement 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 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?

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.

	39 Length Change 72.48 Log No.: SE00112
D3-HSM-33; 109/1	
	29; 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:

ISFSI - HSM 10CC39 Length Change	e 72.48 Log No.: SE00112
D3-HSM-33; 109/129; ES1996	01368 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.

- 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)

MINISTER 1					
ISFSI - HSM 10CC41	Length Change			72,48 Lo	g No.: SE00113
D3-HSM-34; 110/129	ES199601	368 Supple	ment 001 F	levision 0000	Page 1 of 5
Based on the attached disc	assion, does this activ	rity:			
Applicable to 10 CFR 50.5	59 and 10 CFR 72.48	Safety Evaluations	1		
NO	Involve an unreviewe	d safety question (USO)?		
NO	Involve a change in t		• •	Conditions or Bas	ses?
NO	Require a change or a	addition to the UF	SAR/USAR?		
Applicable to 10 CFR 72.4	18 Safety Evaluations				
NO	Involve a Significant	Increase in Occup	ational Dose?		
NO	Involve a Significant				
Prepared by: J. E. Remeni	uk JC	FIGNATURE	Department: <u>NED-</u>	CEU 42-01-04	Date: <u>//- 7- 97</u>
YES	Is a special review re-	quired by groups o	ther than the grou	p to which the Pro	eparer belongs?
Resp. Ind.: G. Tesfaye	Re	esp. Indv.: C. J. Do	obry	Resp. Indv	.: R. H. Beall
Work Group: Licensin	ng W	ork Group: PES	,	Work Gro	
Sitashandaslay & Signature / Date	<u> </u>	SIGNATURE / DATE	11/10/97	OH 3/1/2 SIGNAT	MU/U/47 URE/DATE
Approved	Disapprove	ed .	Approved) Di	sapproved
Signature: J.A. CRWKU. INDEPENI	ETON JA Cun DENT REVIEWER	kleton & Sig		all, Sa GS-DES, GS-TES, o	
Date	197	Dat	MICHAI	ELJ. GAH 11-13-97	+ANIII
The POSRC has reviewed	this evaluation accord	ding to NS-2-101.			
POSRC Meeting No.:	97-137	Da	te:	3.97	
Recommend Rec	commend		1	_	
	sapproval	Signature	POSRC CHAIRM	AN	Date <u>12-3-91</u>
Approved Dis	sapproved	Signature:	PLANT GENERAL	ll	Date <u>/2-3-87</u>
The OSSRC has reviewed	I this evaluation accor	ding to NS-2-100.			
Full OSSRC Committee	eview required? Ye	s No	X		
Signature: OSSRC SES	MONUS CHAIRMAN	Date: _/ \/ 36	98		
If ves. OSSRC Meeting N	lo ·				

ISFSI - HSM 10CC41 Length Change 72.48 Log No.: SE00113
ISFSI - HSM 10CC41 Length Change 72.48 Log No.: SE00113
D3-HSM-34; 110/129; ES199601368 Supplement 001 Revision 0000 Page 2 of 5
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.

SI - HSM 10C				og No.: SE00113
HSM-34; 110/	ES19960136			
			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.

ISFSI - HSM 10CC41 Length Ch	
	ange 72.48 Log No.; SE00113
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	99601368 Supplement 001 Revision 0000 Page 4 of 5
	99601368 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.

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.

- 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)

ISFSI - HSM 10CC42 Length Change	72.48 Log No.: SE00114
D3-HSM-35; 111/129; ES199601368 Supplement 0	01 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/USA	R?
Applicable to 10 CFR 72.48 Safety Evaluations	
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NO Involve a Significant Increase in Occupational D	
NO Involve a Significant Unreviewed Environmental	Impact?
Prepared by: J. E. Remeniuk Departmen	nt: NED-CEU 42-01-04 Date: //- 7-97
PRINTED NAME AND SIGNATURE	
YES Is a special review required by groups other than	the group to which the Preparer belongs?
	the group to which the Frephier belongs.
Resp. Ind.: G. Tesfaye Resp. Indv.: C. J. Dobry	Resp. Indv.: R. H. Beall
Work Group: Licensing Work Group: PES	Work Group: NFM
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Signature: JA. CRWKLETON JA Crunkleton Signature:	LorGS-DES. OS-TES, or PE-PDSU
1/2/2	Jorgs DES STES, OF PE-PDSU MICHAEL J. GAHANULL
Date Date	11-13-97
The POSRC has reviewed this evaluation according to NS-2-101.	
POSRC Meeting No.: 97-/37 Date:	12.3.97
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Recommend Recommend	
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POSRC	HAIRMAN
Approved Signature:	Date 12-3-97
PLÂNT G	ENERAL MANAGER
The OSSRC has reviewed this evaluation according to NS-2-100.	
Full OSSRC Committee review required? Yes No	
O(D)	-
Signature: Date: 1/30/98	
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If yes, OSSRC Meeting No.:	

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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.

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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.

ISFSI - HSM 10CC42 Length Change 72.4	48 Log No.; SE00114
D3-HSM-35; 111/129; ES199601368 Supplement 001 Revision (

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.

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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.

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.

- 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)

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ATTACHMENT 3, SAFETY EVALUATION FORM

ISFSI - HSM 10CC4	3 Length Change 72.48 Log No.: SE00115
D3-HSM-36; 112/1;	29; ES199601368 Supplement 001 Revision 0000 Page 1 of 5
	iscussion, does this activity:
Applicable to 10 CFR 5	0.59 and 10 CFR 72.48 Safety Evaluations
NO NO NO	Involve an unreviewed safety question (USQ)? Involve a change in the Technical Specifications/License Conditions or Bases? Require a change or addition to the UFSAR/USAR?
Applicable to 10 CFR 7	2.48 Safety Evaluations
NO NO Prepared by: <u>J. E. Rem</u>	Involve a Significant Increase in Occupational Dose? Involve a Significant Unreviewed Environmental Impact? eniuk Department: NED-CEU 42-01-04 Date: //- 7- 97
YES	Is a special review required by groups other than the group to which the Preparer belongs?
Resp. Ind.: G. Tesf Work Group: Licer	Sing Work Group: PES Work Group: NFM
SIGNATURE / DATE	SIGNATURE / DATE SIGNATURE / DATE
Approved	Disapproved Approved Disapproved
	NKLETON JA Cunkleten Signature Mihall J. Laharan ENDENT REVIEWER FOR GS-DES GS-TES, or PE-PDSU
Date	Date MICHAEL J. GAHANIII
The DOSDC has review	wed this evaluation according to NS-2-101.
POSRC Meeting No.:	97-/37 Date: 12.3.97
Recommend	Recommend Disapproval Signature: Date 12-3-97
Approved	Disapproved Date 2-3-97 PLANT GENERAL MANAGER
The OSSRC has revie	wed this evaluation according to NS-2-100.
Full OSSRC Committ	ee review required? Yes NoX
Signature: OSSRC	SES CHAIRMAN Date: 1/30/98
If yes, OSSRC Meetin	g No.:

ISFSI - HSM 10CC43 Length Change 72.48 Log No.: S	
D3-HSM-36; 112/129; ES199601368 Supplement 001 Revision 0000 Page	e 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.

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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.

ISFSI - HSM 10CC43 Length Change 72.48 Log No.; SE00	
D3-HSM-36; 112/129; ES199601368 Supplement 001 Revision 0000 Page 3 of	
D3-HSM-36; 112/129; ES199601368 Supplement 001 Revision 0000 Page 3 of	

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.

	72.48 Log No	
ISFSI - HSM 10CC43 Length Change		
D3-HSM-36; 112/129; ES199601368 Supplement 00		age 4 of 5
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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.

ISFSI - HSM 10CC43 Length Change 72.48 Log No.: SE00115
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8 5. 1 5. 1 8. 1 8. 1 8. 1 8. 1 8. 1
D3-HSM-36; 112/129; ES199601368 Supplement 001 Revision 0000 Page 5 of 5
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.

- 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)

ISFSI - HSM 10CC	44 Length Change		72.4	18 Log No.; SE00116
D3-HSM-37; 113/1	29; ES199601368	3 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 Safe	ty Evaluations		
NO NO NO	Involve an unreviewed sa Involve a change in the T Require a change or addit	echnical Specification	ns/License Conditions	or Bases?
Applicable to 10 CFR	72.48 Safety Evaluations			
NO NO	Involve a Significant Inc. Involve a Significant Uni	reviewed Environmen	ital Impact?	04 Data: 11.7 97
Prepared by: J. E. Ren	PRINTED NAME AND SIGN	ATURE Departi	ient: <u>NED-CEO 42-01</u>	-04 Date: //- 7. 97
YES	Is a special review requir	red by groups other th	an the group to which	the Preparer belongs?
Resp. Ind.: G. Tes Work Group: Lice	-	Indv.: C. J. Dobry Group: PES		p. Indv.: R. H. Beall rk Group: NFM
Setachero desta	aultin/n/9 //	NATERE / DATE	2/97 At	1-31 MM 11/11/97 SIGNATURE / DATE
Approved	Disapproved	(Approved	Disapproved
Signature: J.A. CRO INDE	NKLETON JA Cump PENDENT REVIEWER	lefof Signature	Muharl G	Stehner STES, or PE-PDSU
Date//_	12/97	Date	11-13-	
The POSRC has revie	ewed this evaluation according	g to NS-2-101.		
POSRC Meeting No.:	97-137	Date:	12.3.97	•
Recommend Approval	Recommend Disapproval	Signature: POSR	C CHAIRMAN	Date <u>/2-2-57</u>
Approved	Disapproved	Signature: PLANT	GENERAL MANAGE	Date 12-3-87
The OSSRC has revi	ewed this evaluation according	g to NS-2-100.		
Full OSSRC Commit	tee review required? Yes _	No		
Signature: OSSR	Fluons SES CHAIRMAN	Date: 1/30/9	2	
If ves. OSSRC Meeti	ng No ·			

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.

		72.48 Log No.: SE00116
ISFSI - HSM 10CC44 Length Change		
		vision 0000 Page 3 of 5
D3-HSM-37; 113/129; ES199601368 Supp		
D3-HSM-37; 113/129; ES199601368 Supp	lement 001 Rev	vision 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 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.

ISFSI - HSM 10CC44 Length Change 72.48 Log No.: \$	
D3-HSM-37; 113/129; ES199601368 Supplement 001 Revision 0000 Pag	

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.

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.

- 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)

ISFSI - HSM 10CC45 L	ength Change		79 48	Log No.: SE00117
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D3-HSM-38; 114/129;	ES199601368	Supplement 001	Revision 00	000 Page 1 of 5
Based on the attached discu	ssion, does this activity:			
Applicable to 10 CFR 50.59	and 10 CFR 72.48 Safety	Evaluations		
	nvolve an unreviewed safet		and the second	- T 0
	nvolve a change in the Tech tequire a change or addition			r Bases?
Applicable to 10 CFR 72.48	Safety Evaluations			
	nvolve a Significant Increa			
NO I	nvolve a Significant Unrev	iewed Environmental Ir	mpact?	
Prepared by: J. E. Remeniu	RINTED NAME AND SIGNAT		NED-CEU 42-01-0	4 Date: //-7-97
YES I	s a special review required	by groups other than th	e group to which th	e Preparer belongs?
Resp. Ind.: G. Tesfaye Work Group: Licensing	-	dv.: C. J. Dobry roup: PES		Indv.: R. H. Beall Group: NFM
Sutantam) who will signature / bate	11/n/97 /signa	11 /10/9 TURE / DATE	T ME	CALLULLY CONTROL OF THE STATE O
Approved	Disapproved	Appr	roved	Disapproved
Signature: J.A. CRUNKLE INDEPENDI	FTON JA Crubbent REVIEWER		<i>∮-0€</i> GS-DES, GS-T	Safara TES, or PE-PDSU
Date	197	Date	11-13-9	7AHANTIL 7
The POSRC has reviewed	this evaluation according to	NS-2-101.		
POSRC Meeting No.:	97-137	Date:	2.3.97	
	ommend upproval Sig	nature POSRC CH	IAIRMAN	Date/2-3-97
Approved Disa	approved Sig	nature: PLANT GEN	WERAL MANAGER	Date <u>/2-3-87</u>
The OSSRC has reviewed	this evaluation according to	o NS-2-100.		
Full OSSRC Committee re	view required? Yes	No		
Signature: OSSRC SES	CHAIRMAN D	ate: <u>//30/98</u>		
If yes, OSSRC Meeting No	o.:			

ISFSI - HSM 10CC45 Length Change 72.48 Log No.: SE00117
ISFSI - HSM 10CC45 Length Change 72.48 Log No.: SE00117
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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.

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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.

ISFSI - HSM 10CC45 Length Change	72.48 Log No.: SE00117
D3-HSM-38; 114/129; ES199601	1368 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.

		72,48 Log No.: SE00117
ISFSI - HSM 10CC45 Length Chan		
	9601368 Supplement 001 Re	evision 0000 Page 4 of 5
D3-HSM-38; 114/129; ES199		

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.

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.

- 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)

ISFSI - HSM 10CC47	45° Bend Length Ch	ange	72.48 Lo	g No.: SE00118
D3-HSM-39; 115/129	; ES199601368	Supplement 001	Revision 0000	Page 1 of 5
Based on the attached dis	cussion, does this activity:			
Applicable to 10 CFR 50.	59 and 10 CFR 72.48 Safe	ty Evaluations		
NO NO NO		fety question (USQ)? echnical Specifications/Lic tion to the UFSAR/USAR?	ense Conditions or Bas	ses?
Applicable to 10 CFR 72.	48 Safety Evaluations			
NO NO Prepared by: <u>J. E. Remen</u>	Involve a Significant Uni	rease in Occupational Dose eviewed Environmental Im Department: Nature		Date: <u>//- 7- 97</u>
YES	Is a special review requir	ed by groups other than the	group to which the Pr	eparer belongs?
Resp. Ind.: G. Tesfay Work Group: Licensi	ng Work	Indv.: C. J. Dobry Group: PES ////////////////////////////////////	Work Gro	C.: R. H. Beall up: NFM UNE / DATE
Approved Signature: J.A. CRUA INDEPEN Date 11/12.	DENT REVIEWER	Approduces Signatures Mico		Sapproved Asna PEPDSU HANTI
The POSRC has reviewe	d this evaluation according	to NS-2-101.		
POSRC Meeting No.:	97-137	Date:/2	2.3.97	
	ecommend isapproval S	ignature: POSRC CHA	Colc ARMAN	_Date <u>/2-3-8</u> 7
Approved Di	isapprovedS	ignature: PLANT GENI	CRAL MANAGER	_ Date _ /2-3-87
The OSSRC has reviewe	ed this evaluation according	g to NS-2-100.		
Full OSSRC Committee Signature:	review required? Yes			
OSSRC SI	ES CHAIRMAN	7,,5		
If yes, OSSRC Meeting	No.:	_		

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.

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.

ISFSI - HSM 10CC47 45° Bend Length Change D3-HSM-39: 115/129: ES199601368 Sur	72.48 Log No.: SE00118
D3-HSM-39; 115/129; ES199601368 Sup	plement 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.

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.

- 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)

ISFSI - HSM Access Slee	eve Nelson Studs		72.48 Log No.: SE00119
D3-HSM-41; 116/129;	ES199601368 Su	pplement 001 Revis	ion 0000 Page 1 of 5
Based on the attached discussion	on, does this activity:		
Applicable to 10 CFR 50,59 ar	nd 10 CFR 72,48 Safety Evalua	<u>tions</u>	
NO Invo	olve an unreviewed safety quest	tion (USO)?	
NO Invo	olve a change in the Technical	Specifications/License Condi	itions or Bases?
NO Req	uire a change or addition to the	UFSAR/USAR?	
Applicable to 10 CFR 72.48 S	afety Evaluations		
NO Invo	olve a Significant Increase in O	ccupational Dose?	
NO Invo	olve a Significant Unreviewed I	Environmental Impact?	
Prepared by: J. E. Remeniuk		Department: NED-CEU	42-01-04 Date: <u>//- 7- 97</u>
PRI	MED NAME AND SIGNATURE		
YES Is a	special review required by gro	ups other than the group to v	which the Preparer belongs?
Resp. Ind.: G. Tesfaye	Resp. Indv.: C.		Resp. Indv.: R. H. Beall
Work Group: Licensing	Work Group: P	ES /	Work Group: NFM
SETACKARDE MALE "	signature.	11/10/97 (J	SIGNATURE / DATE
Approved	Disapproved	Approved	Disapproved
Signature: JA: CRUNKLETON INDEPENDENT	14 Curkletons	Signature: Michael	9, Lahana ES, ES TES, or PE-PDSU
Date	7	Date MICHAEL	J. GA HANAII 97
The POSRC has reviewed this	s evaluation according to NS-2-	101.	
POSRC Meeting No.:	97-137	Date: 12.3.	97
Recommend Recomm	mend		
	roval Signature:		Date 12-3-11
_		POSRC CHAIRMAN	_
Approved Disappi	roved Signature:	PLANT GENERAL MAN	Date 12-3-91
			AGER
	s evaluation according to NS-2-	CI.	
Full OSSRC Committee review required? Yes NoX			
Signature: OSSRO SES CH	Date: Date:	130/98	
If yes, OSSRC Meeting No.:			

	Access Sleeve Nelson Studs 72.48 Log No.: SE00119
	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.

ISFSI - HSM Access Sleeve Nelson Studs	
	72.48 Log No.: SE00119
D3-HSM-41; 116/129; ES199601368 Supplement 001 Revis	

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.

ISFSI - HSM Access Sleeve Nelson Studs 72.48 Log No.: SE0	
ISFSI - HSM Access Sleeve Nelson Studs 72.48 Log No.: SE0	
D3-HSM-41; 116/129; ES199601368 Supplement 001 Revision 0000 Page 4	

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.

ISFSI - HSM Access Sleeve Nelson Studs 72.48 Log No.: SE00119

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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.

- 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)

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ISFSI - HSM Rail Lu	bricant Change	72.48 Log No.: SE00120
D3-HSM-42; 117/12	9; ES199601368 Supplement (001 Revision 0000 Page 1 of 5
Based on the attached dis	scussion, does this activity:	
Applicable to 10 CFR 50	0.59 and 10 CFR 72.48 Safety Evaluations	
NO	Involve an unreviewed safety question (USQ)?	
NO NO	Involve a change in the Technical Specifications Require a change or addition to the UFSAR/US.	
	-	ra.
Applicable to 10 CFR 72	2.48 Safety Evaluations	
NO NO	Involve a Significant Increase in Occupational I Involve a Significant Unreviewed Environmenta	
	0.10	
Prepared by: J. E. Remer	niuk Departme	ent: NED-CEU 42-01-04 Date: 11-7-97
YES	Is a special review required by groups other than	n the group to which the Preparer belongs?
Resp. Ind.: G. Tesfay	ye Resp. Indv.: C. J. Dobry	Resp. Indv.: R. H. Beall
Work Group: Licens		Work Group: NFM
Belashers 10 Jag SIGNATURE / DATE	16./n/27 //1/10/9 SIGNATURE/DATE	7
	Discoursed	Pid
(Approved)		pproved Disapproved
Signature: J.A. LRVNKI	NOENT REVIEWER Signature.	Muhaul J. Enkanya For GS DES GS TES, or PE-PDSU MICHAEL J. GAHAN III.
	1/ /	MICHAEL J. GAHANIII
The POSPC has reviewe		
POSRC Meeting No.:	red this evaluation according to NS-2-101.	12.3.97
	,	
	Recommend Disapproval Signature	Date 12-3-51
•		CHATRMAN
Approved D	Disapproved Signature PLANT G	Date 12-3-87 GENERAL MANAGER
The OSSBC has review	ved this evaluation according to NS-2-100.	
Full OSSRC Committee	1	
OOI		
Signature. OSSRC S	SLMOW Date: 1/30/98 SES CHAIRMAN	_
If yes, OSSRC Meeting	; No.:	

ISFSI - HSM Rail Lubricant Change 72.48 Log No.: SE	
ISFSI - HSM Rail Lubricant Change 72.48 Log No.: SE	
D3-HSM-42; 117/129; ES199601368 Supplement 001 Revision 0000 Page	

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.

ISFSI - HSM Rail Lubricant Chang		
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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.

ISFSI - HSM Rail Lubricant Change	
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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.

ISFSI - HSM Rail Lubricant Change 72.48 Log No.: SE00120

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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) rail lubricant.

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- 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)