Progress Energy

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United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SERIAL: HNP 03-126
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SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63

SUPPLEMENTARY INFORMATION CONCERNING REQUEST FOR LICENSE AMENDMENT, TECHNICAL SPECIFICATION 5.6.3.d, TAC NUMBER MB7736

Ladies and Gentlemen:

On February 14, 2003, Progress Energy requested a license amendment for the Harris Nuclear Plant (HNP) to allow an increase in the decay heat load from fuel stored in Spent Fuel Pools C and D in Technical Specification 5.6.3.d. This purpose of this letter is to provide the NRC with information regarding Progress Energy's use of the ORIGEN2 code to calculate decay heat, respond to requests from the NRC received by e-mail on September 23, 2003, and to request additional changes to Technical Specification pages to accommodate an administrative update of the Technical Specification Index.

Attachment A provides the discussion concerning implementation of the ORIGEN2 code for calculating decay heat and the impact of this code on the subject license amendment request. Secondly, Attachment B provides the response to questions asked by the reviewer concerning the subject license amendment request. Finally, Attachment C provides Technical Specification markup pages for an administrative update to the Index.

In accordance with 10 CFR 50.91(b)(1), HNP is providing the State of North Carolina with a copy of this letter.

Please contact John Caves, Licensing/Regulatory Programs Supervisor with any questions regarding this letter at (919) 362-3137.

Sincerely,

James Scarola

JS/rgh

Attachments:
A: Change from Standard Review Plan 9.1.3 to ORIGEN-2 for Calculating Decay Heat
B: Response to Reviewer's Questions
C: Administrative Revision to the Technical Specification Index

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A001

Jim Scarola, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge, and belief and the sources of his information are employees, contractors, and agents of Progress Energy Carolinas, Inc. (alternately known as Carolina Power & Light Company).

Darlene S. Yarborough

DARLENE S. YARBOROUGH
NOTARY
***
PUBLIC
HARNETT COUNTY, NC

Notary (Seal)
My commission Expires:

My Comm. Exp. 2-21-2005.

cc: Mr. R. A. Musser, NRC Sr. Resident Inspector
Ms. Beverly Hall, Section Chief N.C. DENR
Mr. C. P. Patel, NRC Project Manager
Mr. L. A. Reyes, NRC Regional Administrator

Attachment A

Change from Standard Review Plan 9.1.3 to ORIGEN-2 for Calculating Decay Heat

On February 14, 2003, Progress Energy requested a license amendment for the Harris Nuclear Plant (HNP) to allow an increase in the decay heat load from fuel stored in Spent Fuel Pools C and D in Technical Specification 5.6.3.d. The method used in this amendment request for calculating spent fuel decay heat was consistent with NRC Standard Review Plan 9.1.3 (SRP 9.1.3), as noted on page A1-7.

Since submittal of the February 14th license amendment request (LAR), HNP has implemented the ORIGEN2 code (version 2.1) for calculating decay heat using 10 CFR 50.59. This change in methodology was made to allow use of a single methodology for calculation of decay heat production for both the Progress Energy used fuel shipping activities and storage in spent fuel pools, as well as to gain flexibility by using the more precise ORIGEN2 code. The NRC previously approved the use of ORIGEN2 for calculating decay heat load in spent fuel pools in the Safety Evaluation Reports for license amendment No. 160 for the Virgil C. Summer Nuclear Station and license amendment No. 242 for the Duane Arnold Energy Center.

To confirm this change in methodology has no impact on this LAR, HNP performed ORIGEN2 calculations for the design heat load cases described in the LAR. The ORIGEN2 results demonstrated that the analytical values for heat loads presented in the LAR and in the responses to the reviewer's questions in Attachment B remain conservative with respect to the evaluation for the revised temperature limits included in the LAR. ORIGEN2 will be used in the future to account for the heat load of the actual inventories of the spent fuel pools.

HNP requests the following change be made to the LAR for clarity:

- Replace Attachment 1, Page A1-7 text:

  The SFPs A and B heat loads were calculated using a method that is consistent with NRC Standard Review Plan (SRP) 9.1.3.

  With:

  The methodology used by HNP for calculation of SFP decay heat load is ORIGEN2. The SFP heat loads referenced in this LAR are analytical values that are conservative with respect to actual heat loads using the ORIGEN2 methodology.

Attachment B
Response to Reviewer's Questions
License Amendment Request for change to Technical Specification 5.6.3.d
Increase Heat Load of C and D Spent Fuel Pools

Reviewer Question No. 1

In Attachment 1 of the LAR (Page A1-1), the licensee states that the projected end of plant life heat removal capacity required in spent fuel pools (SFPs) C and D is 15.63 MBTU/hr. Explain how this projected end of life heat removal capacity was determined.

Response:

The 15.63 MBTU/hr is a long range, bounding forecast of the heat load used in the evaluation of the spent fuel rack configuration. This forecast includes spent fuel from HNP, BNP and RNP. The LAR requests an increase of the existing 1.0 MBTU/hr limit to 7.0 MBTU/hr which, like the 1.0 MBTU/hr limit in the current technical specifications, is less than the long range bounding heat load forecast. The evaluation of the heat removal capacity of the Fuel Pool Cooling and Cleanup System (FPCCS) or the Component Cooling Water (CCW) system is not dependent on the 15.63 MBTU/hr.

HNP Technical Specifications 5.6.3.b and 5.6.3.c specify limits for the number of assemblies in SFP C and D; however the inventory of SFPs C and D will be controlled to limit the total heat load less than the proposed limit of 7.0 MBTU/hr.

Reviewer Question No. 2

In Attachment 1 of the LAR (page A1-5), the licensee states that the impact of the higher SFP heat load on the performance of the CCW system was analyzed using bounding heat load values in the following calculations:

- *CCW supply temperature for each mode of CCW operation*
- *CCW performance during a LOCA*
- *Reactor Coolant System (RCS) Cooldown time when on residual heat removal system (RHRS)*
- *Analysis of the ultimate heat sink (UHS) during a LOCA*
- *CCW flow balance for each mode of CCW operation*

The licensee further stated that with the exception of the RCS Cooldown time and the CCW flow balance, the current FSAR analyses include sufficient design margin to allow SFPs C and D heat load to be increased to 7.0 MBTU/hr. New FSAR analyses for RCS Cooldown time and CCW flow balance were prepared.

a. *Briefly describe the changes that create design margin which allow the increase to SFP C and D heat capacity, while ensuring other components remain adequately cooled.*

Response for part a

The plant changes that create the margin which allow the increase in the SFPs C and D heat load include:

- Raising the SFP bulk temperature limit to 150°F (from 140°F)
- Decreasing the CCW flow from the SFPs A and B spent fuel heat exchangers and increasing the flow to the SFPs C and D spent fuel heat exchangers.

The changes do not alter the minimum CCW flow rates to other components on the CCW system. The higher spent fuel heat load causes CCW supply temperatures to increase by small amounts (<5°F) for normal operation and refueling. These changes were evaluated and found to be acceptable.

b. *Point out the FSAR text for the current FSAR analysis which includes sufficient design margin to allow SFPs C and D heat load to be increased (e.g., examples of design margin values), and for the new FSAR analyses addressing RCS cooldown time and CCW flow balance.*

Response to Part b:

The FSAR currently includes analyses and system description that bound performance required by the increase in the SFPs C and D heat load to 7.0 MBTU/hr. Specific examples include:

The composite spent fuel pool heat load on the CCW system concurrent with Post-LOCA recirculation is 25.31 MBTU/hr. Reference LAR Table A1-3 for SFPs A and B heat load of 18.31 MBTU/hr in addition to 7.0 MBTU/hr for SFPs C and D. The bounding composite heat load used in long term containment analysis is 39.0 MBTU/hr. The bounding composite SFP heat load is an input to the results presented in FSAR Figures 3.11.4-1, 3.11.4-2 and 3.11.6-1 for the long term Post- LOCA containment temperature and pressure.

The composite spent fuel pool heat load is part of the design heat load on the Ultimate Heat Sink. The composite spent fuel pool heat load is again 25.31 MBTU/hr. The bounding value used in the UHS analysis is 27.0 MBTU/hr as indicated in FSAR Table 9.2.1-12.

The CCW system has been evaluated for a maximum RCS cooldown supply temperature of 125°F as described in FSAR Section 9.2.2.1. As described in the response to part "a" above, the total CCW flow requirement remains unchanged. The CCW performance parameters are described in FSAR Table 9.2.2-1.

The RCS cooldown analysis inputs and results change as a result of the increase in the SFP heat load. The current inputs are contained in FSAR Table 5.4.7-1A. The current results are presented in Figures 5.4.7-3 and 5.4.7-4. The information in FSAR Section 5.4.7 will be updated after approval upon implementation of the increase in the allowed heat load in SFPs C and D.

Reviewer Question No. 3

Explain how the analyses of CCW supply temperature for each mode of CCW operation were used in calculating the SFP equilibrium temperature (Attachment 1 of the LAR, Page A1-6). Provide a matrix showing CCW mode of operation versus CCW supply temperature versus SFP equilibrium temperature.

Response:

Calculations were performed using the SFP heat exchanger design details, CCW supply temperature, CCW flow rate, and FPCCS flow rate and heat load. Features of the calculation include:

- Heat losses due to evaporation, conduction and convection were conservatively neglected.
- The CCW flow rate was less than nominal.
- Fouling factor of 0.0005 BTU/hr-ft^2-°F is used. The chemistry of both the CCW and the FPCCS are monitored and controlled.
- SFP thermal inertia is neglected.
- The calculation solved for the lowest SFP inlet temperature that would result in the removal of the required heat load. The equilibrium temperature represents the bulk temperature of the water after it is heated by passing through the spent fuel storage racks.

A matrix of results is provided below in Table 1 and Table 2. The heat loads for this analysis are those presented in LAR Table A1-3.

Table 1

SFPs A and B			
Operating Condition	CCW Supply Temperature (°F)	Equilibrium SFP Temperature (°F)	SFP Temperature Limit Criteria (°F)
Incore Shuffle	109.2	137.1	150
Full Core Offload	See Note 1	150	150
Emergency Core Offload	108.5	134.1	150
Normal Operations	105	125.7	150
RCS Cooldown	125	148.0	150
LOCA Recirculation	125	146.6	160

Note 1 – The allowed CCW supply temperature is a function of the time after reactor shutdown. The curve is a function of time from reactor shutdown because the core decay heat decreases exponentially as a function of time. The function is presented as a table or curve and is incorporated into the administrative controls for refueling activities.

Table 2

SFPs C and D			
Operating Condition	CCW Supply Temperature (°F)	Equilibrium SFP Temperature (°F)	SFP Temperature Limit (°F)
Incore Shuffle	109.2	131.7	150
Full Core Offload	107.8	130.3	150
Emergency Core Offload	108.5	129.9	150
Normal Operations	105	123.1	150
RCS Cooldown	125	147.6	150
LOCA Recirculation	125	144.1	160

Reviewer Question No. 4

In Attachment 1 of the LAR (Pages A1-6 and A1-7), the licensee states the following:

Table A1-2 shows the previous analyzed heat loads and Table A1-3 shows the heat loads analyzed for this license amendment request... The analyzed heat load for SFPs A and B increased from 16.45 MBTU/hr to 18.31 MBTU/hr to allow for a refueling outage as short as 15 days and to provide additional heat storage capacity in the SFPs A and B. The heat load increase in SFPs A and B for the emergency core offload case was due to a more conservative calculation for the decay heat for the discharged core used in that specific case.

For each of the operating conditions (incore shuffle, normal full core offload, etc.) shown in Table A1-3, explain the assumed scenario which resulted in the heat loads (MBTU/hr) listed for SFPs A and B and SFPs C and D respectively. In particular, explain why SFP heat load values remained the same or increased when compared to Table A1-2. With regard to the analyzed heat load for SFPs A and B, explain the rationale to allow for a refueling outage as short as 15 days and to provide for additional heat storage capacity in SFPs A an B. Describe the more conservative calculation of SFP decay heat for the discharge core used in the emergency core offload case.

Response:

A comparison of the changes between Table A1-2 and A1-3 is provided below. As a basis for the comparison of individual cases, the following contributors to heat load are defined.

1. SFPs A and B "Base Heat Load" – SFPs A and B are maintained essentially full with empty spaces for prudent operating reserve. After each HNP refueling, the plant staff moves some PWR fuel to SFP C. This action restores prudent operating reserve capacity in SFPs A and B. The heat load of the fuel prior to the subsequent outage is the Base Heat Load. The Base Heat Load is calculated for the fuel previously discharged to SFPs A and B and projected HNP discharges in the future. This heat load contributor is used in each of the operating conditions.

2. Full Core Offload Heat Load – Space is normally reserved in SFPs A and B for full core offload during a refueling. The full core offload heat load is the heat load added by discharge of the entire core based on end of cycle decay heat. The cooling time varies for each of the Operating Conditions listed in LAR Table A1-3.

3. Most Recent Discharge Batch Heat Load – During a refueling, the discharged fuel is normally placed in SFPs A and B. The Most Recent Discharge Batch Heat Load is the heat load of 65 discharged bundles. The cooling time for this contributor varies depending on the spent fuel heat load case.

The SFPs C and D heat load changes in each case from 1.0 MBTU/hr to 7.0 MBTU/hr. The change allows additional storage in SFPs C and D.

Incore Shuffle – This heat load is the sum of the Base Heat Load and the Most Recent Discharge Batch Heat Load with a cooling time of 6 days. This value did not change between LAR Tables A1-2 (Existing Analysis) and LAR Table A1-3 (License Amendment Analysis).

Normal Full Core Offload – This heat load is the sum of the Base Heat Load and the Full Core Offload Heat Load with a cooling time of 6 days. This value remained unchanged between the LAR Table A1-2 and A1-3. As stated above in Note 1 to Table 1, a time-varying heat load is used to calculate the required CCW supply temperature to commence core offload. The SFPs A and B heat load during Normal Full Core Offload depends on the starting time and duration of the offload. SFPs A and B temperatures are administratively limited to a maximum of 150°F.

Emergency Core Offload – The heat load increases from 42.46 MBTU/hr (LAR Table A1-2) to 46.23 MBTU/hr (LAR Table A1-3). The Table A1-3 heat load is the sum of the Base Heat Load, the Most Recent Discharge Batch Heat Load at a cooling time of 36 days and the Full Core Offload Heat Load at end of cycle with a cooling time of 150 hours. The Table A1-2 heat load is the sum of the Base Heat Load, the Most Recent Discharge Batch Heat Load at 55 days, and the Full Core Offload Heat Load, after 30 effective full power days with a cooling time of 120 hours. These changes were made to eliminate an input of outage duration and to provide a conservative analytical upper bound on the decay heat of this case.

Normal Operation and RCS Cooldown – The heat load is conservatively selected to bound the sum of the Base Heat Load and the Most Recent Discharge Batch Heat Load for a 15 day outage. The FPCCS heat load on the CCW system increases as the outage duration decreases. The outage duration controls the heat load from the discharge batch. Use of a 15 day outage duration provides a conservatively high calculation of spent fuel pool heat loads used in conjunction with other design basis events.

Reviewer Question No. 5

In Attachment 1 of the LAR (Page A1-8), the licensee states the following:

The makeup rates use the heat loads from Table A1-2 and use a makeup source temperature of 125 deg F. This assumed makeup source temperature is conservative because it bounds the Technical Specification 3.7.5.b limit for the Ultimate Heat Sink or 94 deg F and the Technical Specification 3.4.5.d limit for the Refueling Water Storage Tank of 125 deg F. The Emergency Service Water System, which takes water from the Ultimate Heat Sink and the RWST are two possible sources of makeup to the SFP.

The total makeup requirements conservatively assume both FPCCS cooling systems are simultaneously impacted. The total makeup rates are within the makeup capabilities of systems available to makeup water to the SFP.

a. *Provide a matrix showing the makeup sources for the SFPs versus makeup source capability versus makeup source temperature. Identify the whether the makeup source is primary or backup.*
b. *In the above sentence, the makeup rates use the heat loads from Table A1-2. . ." should Table A1-3 be reference instead? Also, in the sentence. "The total makeup requirements conservatively assume both FPCCS cooling subsystems are simultaneously impacted, clarify "simultaneously impacted".*

Response:

Part a:

Table 3 provides a matrix of makeup systems and their capacities.

The cooling subsystems of the FPCCS for HNP subsystems of the FPCCS for HNP consist of redundant safety-related trains for both the north and south pools. The systems are protected from externally generated missiles and are Safety Class 3 systems. The licensing basis of the system requires makeup capacity to offset evaporation from the pool surface at design temperatures.

Complete loss of SFP cooling is not a design basis event for HNP. As allowed by SRP III.1.f, the HNP design includes a backup makeup system to add coolant to the spent fuel pools. As described in FSAR Section 9.1.3, the backup method uses a temporary connection between the Emergency Service Water (ESW) system and the FPCCS. This emergency backup system provides a flow rate greater than the evaporation rate from the pool and canal surfaces. The evaporation rate from the four SFPs and connecting canals is calculated to be less than 20 gpm at a water surface temperature of 160°F. The makeup rate from ESW is a minimum of 30 gpm.

Attachment B
Response to Reviewer's Questions
License Amendment Request for change to Technical Specification 5.6.3.d
Increase Heat Load of C and D Spent Fuel Pools

For clarification, please make the following change to the LAR:

Replace Attachment 1, Page A1-8 last sentence text:

The total makeup rates listed are within the makeup capabilities of systems available to makeup water to the SFP.

With:

The total makeup rate for the maximum boil off is within the capacity of either the Demineralized Water Storage Tank or the Refueling Water Storage Tank flow path. The backup Emergency Service Water method is capable of meeting the makeup rate for normal evaporation from the SFPs.

As presented in LAR Table A1-5 the total makeup rate requirement of the highest heat load case (Emergency Core Offload) is 101.8 gpm. Other makeup sources used in routine operation and the emergency backup source are described in Table 3.

Table 3

Matrix of SFP Makeup Sources

Makeup Source	Makeup Capacity (gpm)	Maximum Temperature (°F)	Seismic Category	Notes
Demin Water Storage Tank (DWST)	>105	See Note 2	Non-seismic	- Tank maximum capacity 500,000 gal. - No Tech Spec required minimum capacity.
Refueling Water Storage Tank (RWST)	> 105	125	Category I	- Tech Spec minimum capacity of 436,000 gal. - Portions of flow path are non-safety related
Reactor Makeup Water Storage Tank (RMWST)	53	See Note 2	Category I	- Tank maximum capacity 85,000 gal. - No Tech Spec required minimum capacity. - Portions of flow path are non-safety related.
Emergency Service Water System	34 per train	94	Category I	- Backup method. - Only one train can be used at a time.

Note 2 – These tanks are outdoor tanks. FSAR Section 2.3.2.1.2 states that the highest recorded local ambient temperature is 107°F.

Response to b:

The observation concerning the reference to LAR Table A1-2 is correct. The correct reference is LAR Table A1-3. Please make the following change to the LAR:

Replace Attachment 1, Page A1-8 second sentence text under SFP Makeup Rates:

The makeup rates use the heat loads from Table A1-2 and use a makeup source temperature of 125°F.

With:

The makeup rates use the heat loads from Table A1-3 and use a makeup source temperature of 125°F

With regard to the phrase "simultaneously impacted", the total required makeup rate in LAR Table A1-5 does not take credit for heat removal by any of the spent fuel pool cooling trains.

Reviewer Question No. 6

In Attachment 1 of the LAR (page A1-10), the licensee states the following:

Table A1-6(b) lists the analyzed time to heatup from the maximum pool bulk temperature for normal operations to 150 degrees F, 160 degrees F and 212 degrees F, respectively. The pool heatup rates are based on the "Normal Operations" heat loads listed in Table A1-3. The corresponding data for the existing design is presented in Table A1-6(a).

For Tables A1-6(a) and A1-6(b), explain how the "Maximum Normal Operating temperatures" for the SFPs were determined. Given that the resulting pool heatup rates are based on the "Normal Operations" heat loads listed in Table A1-3 , are the "Normal Operations" case results bounding for the other operating conditions (e.g. Incore shuffle, normal full core offload, etc.)? Explain.

Response:

The response to Reviewer Question No. 3 describes the calculation of the SFP Equilibrium Temperatures. The respective Maximum Normal Operating Temperature values are 125.7°F for SFPs A and B and 123.1°F for SFPs C and D.

The purpose of LAR Table A1-6(b) is to illustrate the time available to restore FPCCS cooling following a LOCA. The values in Table A1-6(b) only apply to SFP cooling restoration following a LOCA. The values for the remaining cases are presented in Table 4 and Table 5.

Table 4

SFPs A and B Heatup Times

Case	Starting Temperature (°F) Refer to Table 1	Heatup Rate (°F/hr)	Time to 150°F (Hours)	Time to 160°F (Hours)	Time to boiling (Hours)
In-Core Shuffle	137.1	5.75	2.2	3.9	13.0
Normal Core Offload	150	10.56	0.0	0.9	5.8
Emergency Core Offload	134.1	11.98	1.3	2.1	6.5

Table 5

SFPs C and D Heatup Times

Case	Starting Temperature (°F) Refer to Table 2	Heatup Rate (°F/hr)	Time to 150°F (Hours)	Time to 160°F (Hours)	Time to boiling (Hours)
In-Core Shuffle	131.7	2.54	7.2	11.1	31.6
Normal Core Offload	130.3	2.54	7.7	11.6	32.1
Emergency Core Offload	129.9	2.54	7.9	11.8	32.3

Reviewer Question No. 7

In Attachment 1 of the LAR (Page A1-11), the licensee states that the following:

Due to the heat loads in SFPs A and B, that pool complex is the limiting location. The values presented in Tables A1-6(a) and (b) contain several conservatisms in the inputs for the calculated heatup times. In particular:

- *The SFP heat load is based on the beginning of core life*
- *The CCW supply temperatures are based on a SFP composite heat load which bounds the proposed composite heat load*
- *The performance of the FPCCS is conservatively modeled*
- *The water volumes assumed as part of the thermal inertia are conservatively low*
- *The thermal mass of the fuel, fuel rack and SFP structure is neglected*

Provide explanation for the above second, third and fourth conservatisms as follows: for the second, clarify what is meant by "composite heat load", for the third, how is FPCCS conservatively modeled? And for the third [fourth], how are water volumes conservatively low?

Response:

In the second conservatism, the phrase "composite heat load" refers to total heat load from all four pools.

Concerning the third conservatism, the SFP starting temperatures are an input to LAR Table A1-6(b). The calculation of the performance of the FPCCS determines the starting temperature. Reviewer Question No. 3 describes the conservatism used in evaluating FPCCS performance.

Concerning the fourth conservatism, the water volumes are conservative because the calculation neglects the water volume of the Transfer Canals and the Main Transfer Canal that would normally be part of the volume subject to heat up. Including the volume of water in the canals would reduce the heat up rates. FSAR Figure 1.2.2-55 illustrates the relative size of these volumes. The gates between SFPs A and B and the Unit 1 Transfer Canal are inserted infrequently. The gates isolate the spent fuel pools from the transfer canals. The gate between SFP C and the north transfer canal is inserted infrequently. Pending the storage of fuel in SFP D, this pool is isolated.

Reviewer Question No. 8

In Attachment 1of the LAR (Page A1-11), the licensee states the following:

The time available to perform the restoration of cooling to the SFPs after a LOCA is conservatively calculated and provides sufficient time for required operator actions to be implemented. The method used to restore forced cooling of the Spent Fuel Pool has not changed. Therefore, the increase in the SFPs C and D heat load results in acceptable time available for restoration for CCW to FPCCS for LOCA.

Describe the conservative calculation which demonstrates sufficient time to restore cooling to the SFPs after a LOCA. Briefly explain the method used to restore forced cooling to the SFPs (that has not changed).

Response:

Table A1-6(b) of the LAR presents the time available to restore SFP cooling. As described in the response to Reviewer Question No. 3 and Reviewer Question No. 7, there are conservatisms in both "Maximum Normal Operating Temperature" and the method used to calculate the heatup rates.

FSAR Section 9.1.3.3 describes the restoration of CCW to FPCCS following a LOCA.

<u>Reviewer Question No. 9</u>

In terms of heat exchanger performance in determining SFP temperature, discuss any conservatism introduced to more closely approximate actual operating conditions (e.g. heat exchange tube fouling which could impact heat transfer).

Response:

The calculation uses a constant tube side (FPCCS) heat transfer coefficient. The heat transfer coefficient is based on fluid properties at 120°F. The tube side heat transfer coefficient increases approximately 10% with fluid properties at 150°F. The calculation neglected this benefit. Also, the calculation includes a fouling factor of 0.0005 BTU/hr-ft^2-°F. The calculation applies the fouling factor to the inside and outside surface of the tubing. The chemistry of the fluids in CCW and FPCCS is monitored and controlled.

<u>Reviewer Question No. 10</u>

On page A1-9, SFP Design, of the submittal, it is stated that the SFP structure and liner were re-evaluated for a pool temperature of 160°F to account for the new LOCA acceptance criteria, and the results indicated that the liner did not exceed the allowable stress. However, the submittal did not state that the concrete and reinforcing steel in the pool structure did not exceed their allowable stresses. Licensee should make it clear that the concrete and reinforcing steel in the pool structure did not exceed their allowable stresses in its re-evaluation.

Response:

The re-evaluation confirmed that the concrete and reinforcing steel in the pool structure are within their respective allowable stresses. For clarification, please make the following change to the LAR:

Replace Attachment 1, Page A1-9 last sentence text under SFP Design:

> *The evaluation concluded that adequate design margin existed to allow for the higher liner temperature without exceeding allowable stresses.*

With:

> *The evaluation concluded that adequate design margin exists for the SFP structure and liner to allow for the higher pool temperatures without exceeding allowable stresses.*

Attachment C

Administrative Revision to the Technical Specification Index

2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

BASES

BASES

SECTION PAGE

BASES

Delete

INDEX

6.0 ADMINISTRATIVE CONTROLS

Delete

Delete

Revised Technical Specification Pages

2.0 SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS

SECTION PAGE

BASES

SECTION PAGE

3.0/4.0 BASES

BASES

5.0 DESIGN FEATURES

INDEX

6.0 ADMINISTRATIVE CONTROLS

SECTION | PAGE