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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to NRC Request for Additional Information (RAI) Regarding Extended Power Uprate (EPU) License Amendment Request (LAR) No. 205 and Mechanical/Civil Engineering Issues

References:

(1) M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request No. 205: Extended Power Uprate (EPU)," (TAC Nos. ME4907 and ME4908), Accession No. ML103560169, October 21, 2010.

(2) Email from J. Paige (NRC) to S. Franzone (FPL), "EMCB Acceptance Review Questions," December 16, 2010

By letter L-2010-113 dated October 21, 2010 [Reference 1], Florida Power and Light Company (FPL) requested to amend Facility Operating Licenses DPR-31 and DPR-41 and revise the Turkey Point Units 3 and 4 Technical Specifications (TS). The proposed amendment will increase each unit's licensed core power level from 2300 megawatts thermal (MWt) to 2644 MWt and revise the Renewed Facility Operating Licenses and TS to support their operation at this increased core thermal power level. This represents an approximate increase of 15% and is therefore considered an extended power uprate (EPU).

By email from the U. S. Nuclear Regulatory Commission (NRC) Project Manager (PM) dated December 16, 2010 [Reference 2], additional information regarding Mechanical and Civil Engineering issues was requested by the NRC staff in the Mechanical and Civil Engineering Branch (EMCB) to support their acceptance review of the EPU LAR. The RAI consisted of four (4) questions concerning the proposed piping design modifications and analyses for the Main Feedwater (FW), Main Steam (MS), and Component Cooling Water (CCW) systems. These four RAI questions and the applicable FPL responses are documented in the Attachment 1 to this letter.

In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the State Designee of Florida.

This submittal does not alter the significant hazards consideration or environmental assessment previously submitted by FPL letter L-2010-113 [Reference 1].

This submittal contains three (3) new commitments involving completion of the design and analyses for proposed modifications to the FW, MS, and CCW systems.

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Should you have any questions regarding this submittal, please contact Mr. Robert J. Tomonto, Licensing Manager, at (305) 246-7327.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 7, 2011.

Very truly yours,

Michael Kiley
Site Vice President
Turkey Point Nuclear Plant

Attachments

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, Turkey Point Nuclear Plant
USNRC Resident Inspector, Turkey Point Nuclear Plant
Mr. W. A. Passetti, Florida Department of Health

Turkey Point Units 3 and 4

RESPONSE TO NRC RAI REGARDING EPU LAR NO. 205
AND EMCB MECHANICAL/CIVIL ISSUES

ATTACHMENT 1

Response to Request for Additional Information

The following information is provided by Florida Power & Light (FPL) in response to the U. S. Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI). This information was requested to support License Amendment Request (LAR) 205, Extended Power Uprate (EPU), for Turkey Point Nuclear Plant (PTN) Units 3 and 4 that was submitted to the NRC by FPL via letter (L-2010-113) dated October 21, 2010 [Reference 1].

In an email dated December 16, 2010 [Reference 2], the NRC staff requested additional information regarding FPL's request to implement the EPU. The RAI consisted of four (4) questions from the NRC's Mechanical and Civil Engineering Branch (EMCB) regarding some of the proposed piping design modifications and break analyses for portions of the Main Feedwater (FW), Main Steam (MS), and Component Cooling Water (CCW) systems. Each question is documented below with the applicable FPL response.

1. **In Section 2.2.1.2.3 (Attachment 4, Licensing Report) the licensee notes that piping modifications related to the replacement of the number 5 and 6 feedwater heaters will be performed by the PTN design change process. Any impacts to existing pipe rupture locations and associated dynamic effects will be evaluated by the design change process. These statements indicate that the evaluations (design and analysis) of piping modifications and the impact on existing pipe rupture locations and associated dynamic effects required to support the EPU have not yet been performed. Therefore, the licensee has not provided sufficient technical information for staff's review to determine whether reasonable assurance exists to conclude that the integrity of the piping modifications are structurally adequate for the proposed EPU.**

   The design and analysis of the main feedwater piping modifications and their impact on existing pipe break locations and associated dynamic effects required to support the EPU have not been finalized for PTN Units 3 and 4 at this time. The required design and analysis for the portions of the piping associated with the number 5 and 6 feedwater heaters for Unit 3 has been completed. However, other FW system modifications are in progress, including those modifying the feedwater isolation and regulating valves and potentially modifying the bypass control valves and the recirculation piping configuration that could affect the HELB analyses.

   As identified in Licensing Report (LR) Section 2.2.1.1, the PTN criteria for identification of HELB locations outside containment and evaluation of their effects are derived from the AEC 1972 Giambusso letter [Reference 3] and subsequent AEC 'Errata Sheet' letter [Reference 6]. FPL responded to the NRC letter in References 4 and 5. In summary, for the main feedwater system, break locations were postulated at:

   1. The terminal ends
   2. Two intermediate locations, which were chosen based on being the two points of highest stress.

   It is noted that there were no intermediate locations between the terminal ends that exceeded the threshold stress limits established by the original AEC criteria of 0.8 ($S_h + S_A$) under the

loadings associated with seismic and operational plant conditions. No intermediate break locations were required to be postulated under this criterion in the current licensing basis.

The preliminary pipe stress evaluations for the replacement of the number 6 feedwater heaters combined with their associated FW system piping modifications still do not indicate any locations exceeding the threshold stress limits of 0.8 ($S_h + S_A$) (under the loadings associated with seismic and operational plant conditions) which would necessitate defining any new intermediate break locations. The existing terminal pipe break locations remain unchanged at the outlet of the number 6 feedwater heaters and there are no postulated pipe break locations at the number 5 feedwater heaters.

The following table provides current and EPU calculated pipe stresses, intermediate break stress criteria, and stress margins, related to pipe break locations, based on the Unit 3 feedwater heater replacements for the piping from the terminal ends at the number six feedwater heaters up to the feedwater isolation valves. Based on the methodology set forth in FPL letter dated February 26, 1973 [Reference 5] (as updated by FPL letter dated June 21, 1973 [Reference 4]), the pipe stresses are associated with the combined loadings of pressure, deadweight, thermal, and OBE seismic for both the existing condition and the EPU condition. Although not part of the loadings defined in References 4 and 5, the calculated pipe stresses for the EPU condition also include water hammer (i.e., fluid transient) loading which is considered conservative. Furthermore, it is noted that the stresses in the FW system piping from the water hammer loading are relatively insignificant.

LOCATION	NODE NO.	PIPE SIZE inch	EXISTING CONDITION			EPU CONDITION		
			STRESS LEVEL psi	INTERMEDIATE BREAK CRITERIA(1) psi	RATIO	STRESS LEVEL psi	INTERMEDIATE BREAK CRITERIA(1) psi	RATIO
Terminal								
Cont Pene P-27A	595	14	16770	32400	0.518	19056	32400	0.588
Cont Pene P-27B	750	14	20372	32400	0.629	22006	32400	0.679
Cont Pene P-27C	890	14	21152	32400	0.653	24416	32400	0.754
Htr 3E6A	400	18/24	17687	37800	0.422	5281	37800	0.140
Htr 3E6B	355	18/24	15957	37800	0.468	4309	37800	0.114
Intermediate								
Elbow	780E	14	24633	37800	0.652	15627	37800	0.413
Elbow	625E	14	24494	37800	0.648	14899	37800	0.394

(1) Threshold limit of 0.8 ($S_{h+} S_A$)

Although the results of the piping stress analyses described here are for Unit 3, the differences in the FW system piping configuration between Units 3 and 4 are deemed minimal such that the results can be considered representative of both units.

It is also noted that, under PTN's current licensing basis, high energy line breaks need not be postulated in those portions of the piping from the containment wall (penetrations) to and including the outboard isolation valves provided certain installation and in-service inspection examination criteria are met. Therefore, the applicable portions of the feedwater piping have been excluded from the above table. The analytical results presented here still have to be finalized and will require revision to account for other proposed FW modifications including those modifying the feedwater isolation and regulating valves and potentially modifying the bypass control valves and the recirculation piping configuration that could affect the HELB analyses. However, preliminary evaluations of these other FW system piping modifications do not indicate any required changes to the existing pipe break locations or unacceptable piping stresses resulting from any associated dynamic loadings.

As stated above the EPU design and analysis of the pipe rupture locations and associated dynamic effects for the main feedwater piping modifications has not been finalized for PTN Units 3 and 4 at this time. Accordingly, as discussed with the NRC, FPL provides the following commitment with regard to the design and analyses for pipe rupture locations and associated dynamic effects of the main feedwater piping to accommodate EPU conditions:

> "The main feedwater piping, which is being modified by Florida Power and Light (FPL) as part of the implementation of the Extended Power Uprate (EPU) project at Turkey Point Nuclear Plant, Units 3 and 4 (PTN), will be designed using the same design allowable stresses as those specified for Class I Structures, Systems, and Equipment defined in Appendix 5A of the PTN Updated Final Safety Analysis Report (UFSAR). As such, the main feedwater piping will be designed so that the stress limits found in Table 5A-1 of the PTN UFSAR will not be exceeded due to the loadings imposed. The design and analyses of the main feedwater piping for pipe rupture locations and associated dynamic effects is scheduled to be completed and available on site to accommodate the NRC EPU review for PTN Units 3 and 4 by March 31, 2011 and April 30, 2011, respectively."

2. **Under Category Key 3 for Table 1-0.1 (Attachment 4, Licensing Report), the licensee notes that new Main Steam Line Break (MSLB) methodology requires approval by the NRC prior to EPU operation. The licensee has not provided any technical details on MSLB methodology. Therefore, the licensee has not provided sufficient technical information for staff's review to determine whether reasonable assurance exists to conclude that any affected SSCs due to new MSLB methodology are adequate for the proposed EPU.**

The new MSLB methodology that requires prior NRC approval as noted in Table 1.0-1 of Attachment 4, Licensing Report (LR), to the EPU LAR 205 is described in other LR sections. Specifically, LR Section 2.6.3.2, Mass and Energy Release Analysis for Secondary System Pipe Ruptures, describes the use of the NRC approved RETRAN code to calculate the mass and energy releases for the MSLB. LR Section 2.6.1, Primary Containment Functional

Design, describes the containment response following a LOCA or a steam line break using the computer code GOTHIC version 7.2a. The GOTHIC containment model for Turkey Point Units 3 and 4 is consistent with the NRC approved Ginna GOTHIC containment model and follows the conditions of acceptance placed on the Ginna methodology.

3. **In Section 2.5.1.3.2.3.4 (Attachment 4, Licensing Report) the licensee notes the replacement of the 6th feedwater heaters will result in resizing of the discharge piping from 18 inches to 24 inches. The jet impingement zones of influence are increasing due to EPU requiring modifications to shield equipment important to safety. These statements indicate that the evaluations (design and analysis) of 24 inch discharge piping, and shield equipment required to support the EPU have not been performed yet. Therefore, the licensee has not provided sufficient technical information for staff's review to determine whether reasonable assurance exists to conclude that the integrity of the required modifications are structurally adequate for the proposed EPU.**

Two of the terminal end break locations for the main feedwater piping are at the outlet of the Units 3 and 4 E6A/B feedwater heaters. Due to increase of the feedwater heater outlet nozzle diameter to 24" from the current outlet nozzle diameter dimension of 18", there is an associated increase in the size of the pipe break zone of influence. The calculated zone of influence for EPU conditions is 18' for the postulated break (increased from 13.5'). The impact to components important to safety from the increased jet impingement zone of influence has been evaluated in the PTN design change process for the replacement of the number 5 & 6 feedwater heaters in Units 3 and 4. Walkdowns encompassing an 18 foot zone of influence around each unit's number 6 feedwater heater outlet pipe have been performed to identify equipment important to safety. No equipment important to safety exists within the zone of influence of a circumferential main feedwater pipe rupture at the outlet nozzle terminal end. Safety-related pressure transmitters PT-3/4-486, PT-3/4-464, and PT-3/4-476 were identified to fall within or just outside the zone of influence of a longitudinal main feedwater pipe rupture at the outlet nozzle terminal end in both Unit 3 and Unit 4. These components are located within the main steam valve platform trestle area.

To protect these components new deflector shields will be installed on the feedwater outlet piping at the postulated longitudinal break locations at the number 6 feedwater heaters outlet nozzles. The shields are designed to redirect jet forces and guide stream loads in a direction away from the safety related equipment. The deflector shield is in a final design phase and will be evaluated further in the PTN design change process upon completion of the design. The preliminary configuration proposed for the HELB Deflector shield is shown in Figure 1.

The design and analytical details for the HELB deflector shield for PTN Units 3 and 4 are not yet finalized but, when complete, will be incorporated into each unit's main feedwater system modification package. The deflector shields will be designed as Class III Structures, Systems, and Equipment (SSE) but using the same design allowable stresses as those used for Class I SSEs defined in Appendix 5A of the PTN Updated Final Safety Analysis Report (UFSAR). Accordingly, as discussed with the NRC, FPL provides the following commitment with regard to the design and analyses of the HELB deflector shields that are planned to be

installed on the number 6 main feedwater heater outlet piping in order to accommodate EPU conditions:

> "The HELB deflector shields to be installed on the number 6 main feedwater heater outlet piping, which is being modified by Florida Power and Light (FPL) as part of implementation of the Extended Power Uprate (EPU) project at Turkey Point Nuclear Plant, Units 3 and 4 (PTN), will be designed as Class III Structures, Systems, and Equipment (SSE) but using the same design allowable stresses as those specified for Class I SSEs defined in Appendix 5A of the PTN Updated Final Safety Analysis Report (UFSAR). As such, the HELB deflector shields will be designed so that the stress limits found in Appendix 5A of the PTN UFSAR will not be exceeded due to the loadings imposed. The HELB deflector shield design and analyses are scheduled to be completed and available on site to accommodate the NRC EPU review for PTN Units 3 and 4 by March 31, 2011 and April 30, 2011, respectively."

4. **Tables 2.2.2.2-3 and 2.2.2.2-4 (Attachment 4, Licensing Report), provide Attributes of Concern for pipe support modifications for Component Cooling and Main Steam piping systems for PTN Units 3 and 4. It is not clear from these tables whether the design and analytical details of modifications for welds, structural members, integral welded attachments (IWA), base plate, anchor bolts, rods, U-bolts, and new snubbers are complete. The licensee is requested to clarify whether the designs for the above modifications are completed or still in progress.**

   The design and analytical details for pipe support modifications for the CCW and MS piping systems for PTN Unit 3 are in progress at this time, and those for PTN Unit 4 will not be completed until after the supports can be walked down during the Spring 2011 Unit 4 refueling outage. The walkdowns of the Unit 3 Component Cooling Water (CCW) system and Main Steam (MS) system piping were completed during the Fall 2010 Unit 3 refueling outage. The walkdown activities were needed to confirm the feasibility of the design changes planned for the twenty (20) CCW pipe supports and two (2) MS pipe supports listed in LR Table 2.2.2.2-3 as requiring modification for PTN Unit 3. Walkdowns of the Unit 4 CCW system and MS system piping are similarly needed for the eleven (11) CCW pipe supports and two (2) MS pipe supports listed in LR Table 2.2.2.2-4 as requiring modification for PTN Unit 4. The analytical details of the modifications for these pipe support components such as welds, structural members, integral welded attachments, base plates, anchor bolts, rods, U-bolts and snubbers are in progress. The design and modification of these components is being performed in accordance with the PTN design change process and is in progress.

   As previously stated the design and analytical details for pipe support modifications for the CCW and MS system piping systems for PTN Unit 3 are not complete at this time, and those for PTN Unit 4 will not be completed until after these systems can be walked down during the Spring 2011 Unit 4 refueling outage. Accordingly, as discussed with the NRC, FPL provides the following commitment with regard to the design of the CCW and MS system piping supports to accommodate EPU conditions:

"The CCW and MS system piping supports, which are being modified by Florida Power and Light (FPL) as part of the implementation of the Extended Power Uprate (EPU) project at Turkey Point Nuclear Plant, Units 3 and 4 (PTN), will be designed using the same design allowable stresses as those specified for the Class I Structures, Systems, and Equipment Design Requirements defined in Appendix 5A of the PTN Updated Final Safety Analysis Report (UFSAR). As such, the CCW and MS system piping supports will be designed so that the stress limits found in Appendix 5A of the PTN UFSAR will not be exceeded due to the loadings imposed. The CCW and MS systems' piping support design and analyses are scheduled to be completed and available on site to accommodate the NRC EPU review for PTN Units 3 and 4 by March 31, 2011 and April 30, 2011, respectively."

References

1. M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request No. 205: Extended Power Uprate (EPU)," (TAC Nos. ME4907 and ME4908), Accession No. ML103560169, October 21, 2010.
2. NRC Email from Jason Paige (NRC) to Steve Franzone (FPL), "EMCB Acceptance Review Questions," December 16, 2010
3. NRC Letter from A. Giambusso (AEC) to Dr. J. Coughlin (FPL), December 18, 1972
4. FPL Letter from Dr. J. Coughlin (FPL) letter to A. Giambusso (AEC), "Analysis of Postulated Pipe Failures Outside of Containment Structures," June 21, 1973
5. FPL Letter from James Coughlin (FPL) letter to A. Giambusso (AEC), "Analysis of Postulated Pipe Failures Outside of Containment Structures", February 26, 1973
6. NRC Letter from Karl Kniel (AEC) to Dr. J. Coughlin (FPL), January 24, 1973, Errata Sheet

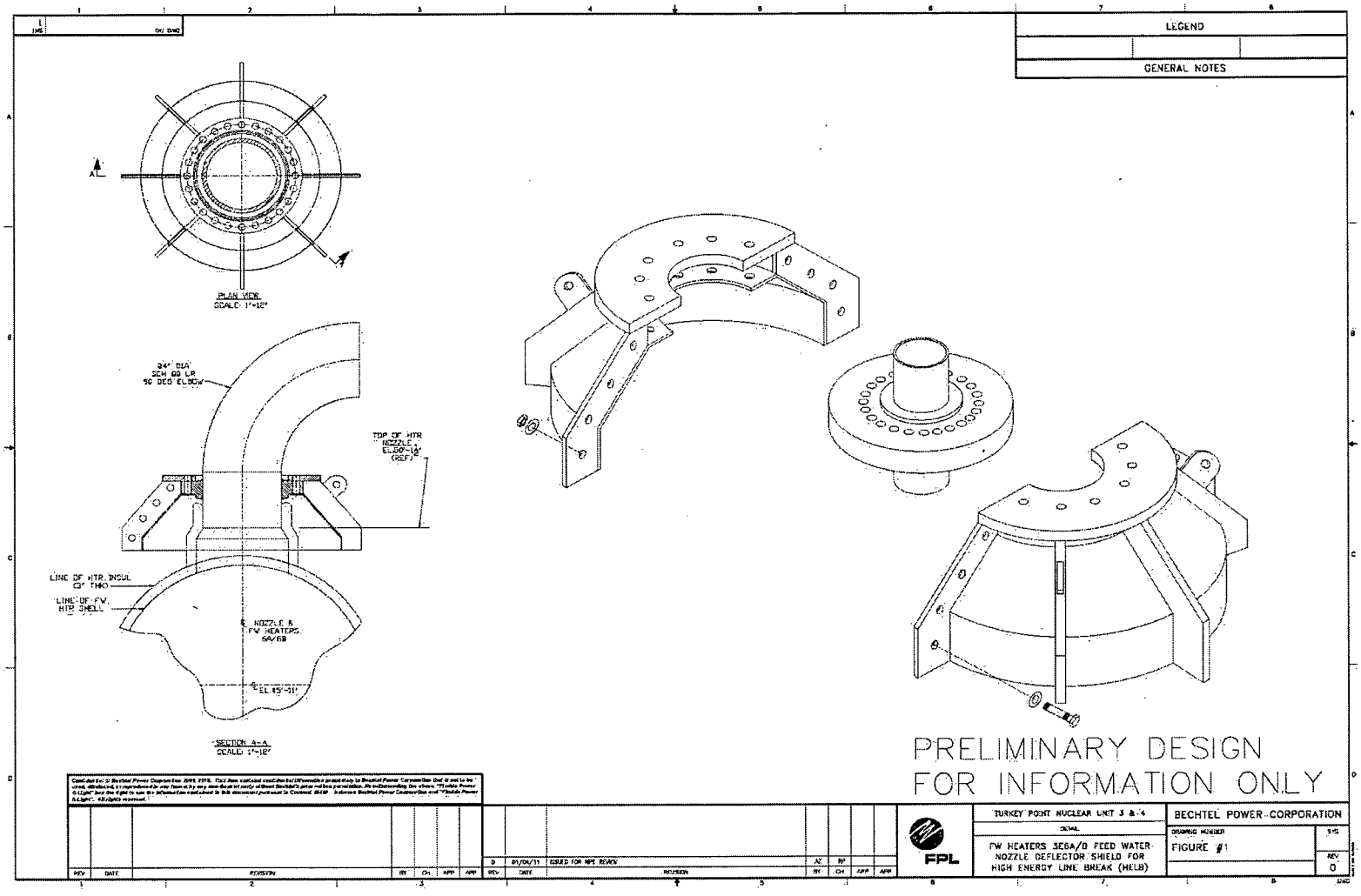

Figure 1 - Conceptual Design of Feedwater Heater Outlet Nozzle HELB Deflector Shield