



JUL 13 2012

L-2012-179  
10 CFR 50.90

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

Re: Turkey Point Unit 3  
Docket Nos. 50-250

Response to NRC Request for Additional Information Regarding Extended Power Uprate and Unit 3 License Condition 3.J.1 on Spent Fuel Pool Cooling System Heat Exchanger Design

References:

- (1) J. Paige (NRC) to M. Nazar (FPL), "Turkey Point Units 3 and 4 – "Issuance of Amendments Regarding Extended Power Uprate (TAC Nos. ME4907 and ME4908)," Accession No. ML11293A365, June 15, 2012.
- (2) M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2012-143), "Supplemental Response to NRC Request for Additional Information Regarding Extended Power Uprate License Amendment Request No. 205 and Spent Fuel Pool Cooling System Structural Design (Unit 3)," June 19, 2012.
- (3) Email from J. Paige (NRC) to R. Tomonto (FPL), "DRAFT: Request for Additional Information RE Turkey Point EPU License Condition," July 2, 2012.

On June 15, 2012, the U. S. Nuclear Regulatory Commission (NRC) issued Extended Power Uprate (EPU) Amendments 249 and 245 for Renewed Facility Operating Licenses DPR-31 and DPR-41 for Turkey Point Units 3 and 4, respectively [Reference 1]. The amendments included a license condition for each unit, i.e., 3.J.1 for Unit 3 and 3.K.1 for Unit 4, titled Extended Power Uprate Modifications. These license conditions state:

"Prior to completion of the Cycle 26 [27] refueling outage for Unit 3 [4], the licensee shall provide confirmation to the NRC staff that the design and structural integrity evaluations associated with the modifications related to the spent fuel pool supplemental heat exchangers are complete, and that the results demonstrate compliance with appropriate UFSAR and code requirements. As part of the confirmation, the licensee shall provide a summary of the structural qualification results of the piping, pipe supports, supplemental heat exchanger supports, and the inter-tie connection with the existing heat exchanger for the appropriate load combinations along with the margins."

On June 19, 2012, Florida Power and Light Company (FPL) submitted the required documentation via letter L-2012-143 [Reference 2] confirming that the design and structural integrity evaluations associated with the Unit 3 modifications related to the spent fuel pool supplemental heat exchanger had been completed and the results demonstrated compliance with appropriate UFSAR and code requirements. In accordance with Unit 3 license condition 3.J.1, the letter provided a summary of the structural qualification results of the piping, pipe supports, supplemental heat exchanger supports, and inter-tie connection with the existing heat exchanger for appropriate load combinations along with the margins.

ADD 1  
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On July 2, 2012, FPL received a request for additional information (RAI) related to the spent fuel pool supplemental heat exchanger modification [Reference 3] from the NRC Project Manager (PM) on behalf of the NRC's Mechanical and Civil Engineering Branch (EMCB) staff. On July 3, 2012, a phone call was held between FPL and the NRC to discuss the RAI. The requested additional information is provided in 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.

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 July 13, 2012.

Very truly yours,



Michael Kiley  
Site Vice President  
Turkey Point Nuclear Plant

Attachment

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

**ATTACHMENT 1**

**Turkey Point Unit 3**

**RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION  
REGARDING EXTENDED POWER UPRATE AND UNIT 3 LICENSE CONDITION 3.J.1  
ON SPENT FUEL POOL COOLING SYSTEM HEAT EXCHANGER DESIGN**

Response to Request for Additional Information

The following information is provided by Florida Power & Light Company (FPL) in response to the U.S. Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI). This information is required to satisfy Unit 3 License Condition 3.J.1 regarding the spent fuel pool cooling system supplemental heat exchanger modification per Extended Power Uprate (EPU) Amendment 249 for Turkey Point Nuclear Plant (PTN) Unit 3 that was issued on June 15, 2012 [Reference 1].

On June 15, 2012, the U. S. Nuclear Regulatory Commission (NRC) issued Extended Power Uprate (EPU) Amendments 249 and 245 for Renewed Facility Operating Licenses DPR-31 and DPR-41 for Turkey Point Units 3 and 4, respectively [Reference 1]. The amendments included a license condition for each unit, i.e., 3.J.1 for Unit 3 and 3.K.1 for Unit 4, titled Extended Power Uprate Modifications. These license conditions state:

"Prior to completion of the Cycle 26 [27] refueling outage for Unit 3 [4], the licensee shall provide confirmation to the NRC staff that the design and structural integrity evaluations associated with the modifications related to the spent fuel pool supplemental heat exchangers are complete, and that the results demonstrate compliance with appropriate UFSAR and code requirements. As part of the confirmation, the licensee shall provide a summary of the structural qualification results of the piping, pipe supports, supplemental heat exchanger supports, and the inter-tie connection with the existing heat exchanger for the appropriate load combinations along with the margins."

On June 19, 2012, FPL submitted the required documentation via letter L-2012-143 [Reference 2] confirming that the design and structural integrity evaluations associated with Unit 3 modifications related to the spent fuel pool supplemental heat exchanger had been completed and the results demonstrated compliance with appropriate UFSAR and code requirements. In accordance with license condition 3.J.1, the letter provided a summary of the structural qualification results of the piping, pipe supports, supplemental heat exchanger supports, and inter-tie connection with the existing heat exchanger for appropriate load combinations along with margins.

On July 2, 2012, FPL received a request for additional information (RAI) related to the spent fuel pool supplemental heat exchanger modification via email from the NRC Project Manager (PM) [Reference 3] on behalf of the NRC's Mechanical and Civil Engineering Branch (EMCB) staff. The email stated that the NRC staff had completed its review of the information provided by letter L-2012-143 dated June 19, 2012 and its attachment. The email further stated that the structural qualification of the piping system modification associated with the spent fuel pool supplemental heat exchanger included the qualification of all the components (such as new piping, new pipe supports, in-line components such as valves, equipment nozzles, equipment supports, inter-tie w/ existing piping, and any impact on the existing piping and supports). The email also contained the following request for additional information:

- (a) After review of the June 19, 2012, supplement, the staff determined that the nozzle loads for the spent fuel pool heat exchangers, and the valve accelerations are not addressed by the licensee. Therefore, the staff requests that the licensee provide the summary for (i) nozzle loads for the applicable load combinations along with the allowable nozzle loads, and the margins, and (ii) computed valve accelerations for seismic loading (OBE & SSE) and the allowable limits.
- (b) The NRC staff also requests to provide a similar summary described in (a) above for Turkey Point Unit 4 Prior to completion of the cycle 27 refueling outage.

On July 3, 2012, a phone call was held between FPL and the NRC to obtain a better understanding of the RAI. Based on the discussion, the following additional Unit 3 deliverables were established:

- (a) FPL will provide a table documenting the evaluation of the nozzle loads for the inlet and outlet nozzles for the new supplemental spent fuel pool heat exchanger compared with allowables.
- (b) FPL will provide evaluation of valve accelerations for the main process isolation valves and cross-tie valves for the same new Unit 3 supplemental heat exchanger compared with allowables.

The requested additional design information is provided below.

The main process lines servicing the new supplemental spent fuel pit heat exchanger (3E208B) for Turkey Point Unit 3 consist of the Spent Fuel Pool (SFP) Cooling System and the Component Cooling Water (CCW) System. Each system has a single inlet and a single outlet connection to the supplemental heat exchanger; therefore a total of four main process connections.

The SFP Cooling System removes the decay heat generated by the radioactive spent nuclear fuel assemblies that are stored in the SFP during normal plant operations and refueling operations. SFP cooling pumps take suction from the SFP, circulate the water through the tube side of the SFP heat exchanger and return the water back to the SFP. The shell side of the heat exchanger is cooled by the CCW System. The CCW System is a closed loop with fluid being continuously circulated through the system by the CCW pumps. The CCW System is the heat sink for safety-related components and for non-safety-related components that are in potentially radioactive systems.

For the SFP inlet line, a single isolation valve was added. For the SFP outlet line, only a flow adjustment valve was added as part of the return line to the SFP. For the CCW inlet line, a single isolation valve was added. For the CCW outlet line, both an isolation valve and a flow adjustment valve were added.

The attached Tables 1-4 provide the stress results for the heat exchanger nozzle loads and valve accelerations. The results are provided for each applicable piping stress analysis calculation, as each calculation contains both nozzle load tabulations and valve acceleration tabulations.

The nozzle load tabulations are enveloped loads considering combinations of load cases to conservatively bound nozzle loading conditions. As such, the nozzle loads contained within the attached tables are beyond the calculated loadings that would occur under any postulated scenario of simultaneous loading conditions. The loadings presented in the attached tables do include the loadings from the Maximum Hypothetical Earthquake (i.e., SSE equivalent loading). In all cases the calculated nozzle loads are low compared to the allowable nozzle loading derived from the Engineering Specification used for procurement of the supplemental spent fuel pit heat exchanger.

The valve acceleration tabulations are also enveloped loads considering combinations of load cases to conservatively bound nozzle loading conditions. As such, the valve accelerations contained within the attached tables are beyond the calculated loadings that would occur under any postulated loading condition. The loadings presented in the attached tables do include consideration of the effects from the Maximum Hypothetical Earthquake (i.e., SSE equivalent loading). In all cases the calculated valve accelerations are low compared to the allowable valve accelerations (derived as the acceleration levels utilized in the seismic qualification evaluations of the valves). The valve accelerations utilized for the valve evaluations were generally at least 3g's in each horizontal direction and 2 g's in the vertical direction.

**Table 1**  
**Piping Analysis: SFP-01**

Description: Discharge Piping from SFP Pump 3P212A, 3P212B, & Emergency SFP Pump Discharge to SFP Heat Exchangers 3E208A & 3E208B

**NOZZLE LOAD TABULATION – SUPPLEMENTAL SPENT FUEL PIT HEAT EXCHANGER**

Equipment Nozzle	Fy (lb) (Axial)	Mx (ft-lb) (Circumferential Moment )	Mz (ft-lb) (Longitudinal Moment )
<b>HEAT EXCHANGER 3E208B SFP INLET NOZZLE</b>	1041	3157	2153
<b>Allowable Loads for 10" Nozzle</b>	5395	8850	11506

Y = parallel to Heat Exchanger Nozzle and vertical; X = parallel to Heat Exchanger centerline (in plant East—West direction) and the other axis (Z) by right hand rule.

**Valve Acceleration Tabulation**

Valve Description	Valve Tag No.	Valve Acceleration (g)			Allowable Valve Acceleration (g)			Design Margin		
		X	Y	Z	X	Y	Z	X	Y	Z
<b>SFP Pump 3P212B Isolation Valve</b>	3-908A	0.235	0.155	0.159	3	2	3	0.08	0.08	0.05
<b>SFP HX 3E208B SFP Inlet Isolation Valve</b>	3-919	0.571	0.147	0.214	3	2	3	0.19	0.07	0.07

X = plant East—West direction; Y = Vertical; Z = plant North—South direction

Design margin is defined as the ratio of calculated valve acceleration divided by the allowable valve acceleration.

**Table 2**  
**Piping Analysis: SFP-02**

Description: Piping from SFP Heat Exchanger 3E208A and 3E208B Outlet Nozzles to Spent Fuel Pool

**NOZZLE LOAD TABULATION – SUPPLEMENTAL SPENT FUEL PIT HEAT EXCHANGER**

Equipment Nozzle	Fy (lb) (Axial)	Mx (ft-lb) (Circumferential Moment )	Mz (ft-lb) (Longitudinal Moment )
<b>HEAT EXCHANGER 3E208B SFP OUTLET NOZZLE</b>	1299	2242	8288
<b>Allowable Loads for 10" Nozzle</b>	5395	8850	11506

Y = parallel to Heat Exchanger Nozzle and vertical; X = parallel to Heat Exchanger centerline (in plant east—west direction) and the other axis (Z) by right hand rule.

**Valve Acceleration Tabulation**

Valve Description	Valve Tag No.	Valve Acceleration (g)			Allowable Valve Acceleration (g)			Design Margin		
		X	Y	Z	X	Y	Z	X	Y	Z
<b>SFP HX 3E208B SFP Outlet Isolation Valve</b>	3-927	0.166	0.140	0.157	3	3	3	0.06	0.05	0.05

X = plant East—West direction; Y = Vertical; Z = plant North—South direction

Design margin is defined as the ratio of calculated valve acceleration divided by the allowable valve acceleration.

**Table 3**  
**Piping Analysis: CCW-01**

Description: CCW Piping from Supply Header to Supplemental Heat Exchanger 3E208B (also to 3E208A)

**NOZZLE LOAD TABULATION – SUPPLEMENTAL SPENT FUEL PIT HEAT EXCHANGER**

Equipment Nozzle	Fy (lb) (Axial)	Mx (ft-lb) (Circumferential Moment )	Mz (ft-lb) (Longitudinal Moment )
<b>HEAT EXCHANGER 3E208B CCW INLET NOZZLE</b>	976	2434	1912
<b>Allowable Loads for 10” Nozzle</b>	5395	8850	11506

Y = parallel to Heat Exchanger Nozzle and vertical; X = parallel to Heat Exchanger centerline (in plant East—West direction) and the other axis (Z) by right hand rule.

**Valve Acceleration Tabulation**

Valve Description	Valve Tag No.	Valve Acceleration (g)			Allowable Valve Acceleration (g)			Design Margin		
		X	Y	Z	X	Y	Z	X	Y	Z
<b>SFP HX 3E208B CCW Inlet Isolation Valve</b>	3-779	0.209	0.203	0.638	3	2	3	0.07	0.10	0.21

X = plant East—West direction; Y = Vertical; Z = plant North—South direction

Design margin is defined as the ratio of calculated valve acceleration divided by the allowable valve acceleration.



**Table 4**  
**Piping Analysis: CCW-02**

Description: CCW Piping Return Header from Supplemental Heat Exchanger 3E208B (also from 3E208A)

**NOZZLE LOAD TABULATION – SUPPLEMENTAL SPENT FUEL PIT HEAT EXCHANGER**

Equipment Nozzle	Fy (lb) (Axial)	Mx (ft-lb) (Circumferential Moment )	Mz (ft-lb) (Longitudinal Moment )
<b>HEAT EXCHANGER 3E208B CCW OUTLET NOZZLE</b>	958	2615	2382
<b>Allowable Loads for 10" Nozzle</b>	5395	8850	11506

Y = parallel to Heat Exchanger Nozzle and vertical; X = parallel to Heat Exchanger centerline (in plant East—West direction) and the other axis (Z) by right hand rule.

**Valve Acceleration Tabulation**

Valve Description	Valve Tag No.	Valve Acceleration (g)			Allowable Valve Acceleration (g)			Design Margin		
		X	Y	Z	X	Y	Z	X	Y	Z
<b>SFP HX 3E208B CCW Outlet Throttle Valve</b>	3-775B	0.143	0.101	0.577	3	3	3	0.05	0.03	0.19
<b>SFP HX 3E208B CCW Outlet Isolation Valve</b>	3-776B	0.148	0.097	0.577	3	2	3	0.05	0.05	0.19

X = plant East—West direction; Y = Vertical; Z = plant North—South direction

Design margin is defined as the ratio of calculated valve acceleration divided by the allowable valve acceleration.

## **Conclusion**

In accordance with the requirements of Unit 3 License Condition 3.J.1, FPL has provided assurance that the design and structural integrity evaluations associated with the Unit 3 modifications related to the spent fuel pool supplemental heat exchanger are complete and that the results demonstrate compliance with the appropriate UFSAR and code requirements. A summary of the structural qualification results for the piping, pipe supports, major valves, and supplemental heat exchanger nozzles and supports for appropriate load combinations along with the associated design margins has also been provided via FPL letters L-2012-143 and L-2012-179.

## **References**

1. J. Paige (NRC) to M. Nazar (FPL), "Turkey Point Units 3 and 4 – "Issuance of Amendments Regarding Extended Power Uprate (TAC Nos. ME4907 and ME4908)," Accession No. ML11293A365, June 15, 2012.
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