

NRR-PMDAPEm Resource

From: Klett, Audrey
Sent: Monday, August 17, 2015 5:45 PM
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Cc: 'Hanek, Olga' (Olga.Hanek@fpl.com); 'Mihalakea, Stavroula' (Stavroula.Mihalakea@fpl.com)
Subject: Request for Additional Information re. Turkey Point Unit 3 Relief Request No. 1, Revision 1 for 5th ISI Interval (TAC MF5798)

Hi Mitch,

By application dated March 2, 2015 (Ref. 6), and pursuant to 10 CFR 50.55a(z)(2), Florida Power & Light Company (the licensee) submitted Revision 1 to Relief Request No. 1 for Turkey Point Nuclear Generating Unit No. 3 (TPNG-3), requesting relief for the fifth 10-Year Inservice Inspection Interval.

The U.S. Nuclear Regulatory Commission (NRC) Staff reviewed the application and needs additional information to complete its review. The NRC staff's request for additional information (RAI) is provided below. As discussed with Ms. Olga Hanek of the licensee's staff via email on August 17, 2015, the NRC requests a response to the RAI within 30 days of this email.

RAI-1

WCAP-17973-NP states that the insurge and outsurge transients for the pressurizer are based on a Modified Operating Procedure (MOP) that is described in Westinghouse Report, WCAP-14950, Revision 0, "Mitigation and Evaluation of Pressurizer Insurge/Outsurge Transients," dated February 25, 1998. However, the MOP does not appear to be incorporated into the TPNG-3 plant Technical Specifications (TS) or Updated Final Safety Analysis Report (UFSAR). Explain how WCAP-14950 is incorporated into the TPNG-3 design basis, how it can be assured that TPNG-3 will follow the MOP, and how the pressurizer insurge/outsurge transients are conservative for use at TPNG-3.

RAI-2

Confirm that the applied stress intensity factor (K) equation used for both fatigue crack growth and the allowable end-of-evaluation period flaw size is the "Plate with Hole, Corner Crack, Semi-Elliptical Shape, Through Wall Membrane and Bending Stress (KPHSC2)" case from Section C4.4 of API-579/ASME FFS-1 2007 Fitness-For-Service (Ref. 9). If this is not the correct equation, please identify the correct equation.

RAI-3

For the equation discussed in RAI-2, the crack and geometry dimensional limits in Section C.4.4.2 of Ref. 1 provide limits of $0.5 \leq R_h/t \leq 2.0$ for this applied stress intensity factor solution. From Figure C.10 of Reference 2, R_h is the hole radius and t is the plate thickness. References 7 and 8 did not provide the values of R_h or t that were used in the TPNG-3 heater sleeve flaw evaluation. However, based on the staff's knowledge of typical pressurizer heater sleeve and bottom head dimensions, the staff is concerned that R_h/t may be outside the applicability limit for the equation.

- a. Provide R_h and t applicable to the determination of K_I for the TPNG-3 heater sleeve.
- b. If the limit of $0.5 \leq R_h/t \leq 2.0$ is not met by the TP-3 heater sleeve geometry, justify using the equation from Section C.4.4 outside the specified bounds of applicability.

RAI-4

For the equation discussed in RAI-2, Figure C.10 of Ref. 9 shows that W is the distance from the hole centerline to the edge of the plate, or one-half the plate width. What is the basis for the value of W used in the TPNG-3 pressurizer heater sleeve flaw evaluation?

RAI-5

What weld residual stress profiles were considered in the determination of the applied K values for fatigue crack growth and the allowable end-of-evaluation period flaw size? If weld residual stresses were not considered, explain and justify why they were excluded.

RAI-6

With respect to the fracture toughness used in the linear elastic fracture mechanics (LEFM) evaluation, the licensee stated that it used generic data for SA-216 Grade WCC (the pressurizer lower head material) because plant-specific data was not available. A reference nil-ductility temperature (RT_{NDT}) was determined based on the generic data. The response to RAI 3.b in the licensee's April 9, 2014, RAI response stated that the NUREG-0800 method was used to estimate the RT_{NDT} . Some of the methods for determining initial RT_{NDT} of Branch Technical Position (BTP) 5-3 of NUREG-0800 have been identified as nonconservative, specifically B1.1(3)(a), B1.1(3)(b), and B1.1(4). Details of NRC staff and industry evaluations of this nonconservatism were presented at a February 19, 2015 public meeting on reactor pressure vessel issues (Refs. 10 through 15). The staff therefore requests the following:

- a. Describe how the initial RT_{NDT} for the SA-216, Grade WCC generic material was determined. The description should describe whether BTP 5-3 was used and, if so, which regulatory position from BTP 5-3 was used and any additional margin that was considered in the determination of the generic RT_{NDT} value.
- b. Based on the issues raised on BTP 5-3, identify whether additional margin is necessary in the determination of the initial RT_{NDT} value for the SA-216, Grade WCC generic material to adjust for the potential nonconservatism in the initial RT_{NDT} value.
- c. If the initial RT_{NDT} value is modified in response to this RAI, revise the flaw evaluation appropriately and resubmit it to the NRC for review.

References

1. Turkey Point Unit 3 - Inservice Inspection Plan - Fifth Inspection Interval Unit 3 Relief Request No. 1, April 4, 2014 (ADAMS Accession No. ML14098A036).
2. Turkey Point Unit 3 - Inservice Inspection Plan - Fifth Inspection Interval Unit 3 Relief Request No. 1 - Response to Request for Additional Information, April 9, 2014 (ADAMS Accession No. ML14101A366).
3. Turkey Point Unit 3 - Inservice Inspection Plan - Fifth Inspection Interval Unit 3 Relief Request No. 1 - Response to Follow-up Request for Additional Information, April 14, 2014 (ADAMS Accession No. ML14106A603).
4. Turkey Point Nuclear Generating Unit No. 3, Verbal Authorization of Relief Request No. 1 for Repair of Pressurizer Stainless Steel Heater Sleeve Without Flaw Removal - Fifth 10-Year Inservice Inspection Interval (TAC NO. MF3834), April 16, 2014 (ADAMS Accession No. ML14106A050).
5. Turkey Point Nuclear Generating Unit No. 3 - Safety Evaluation for Relief Request No. 1 for Fifth 10-Year Inservice Inspection Interval - Repair of Pressurizer Stainless Steel Heater Sleeve Without Flaw Removal (TAC NO. MF3834), October 9, 2014 (ADAMS Accession No. ML14122A268).
6. Turkey Point Unit 3 - Inservice Inspection Plan - Fifth Inspection Interval Unit 3 Relief Request No. 1, Revision 1, March 2, 2015 (ADAMS Accession No. ML15077A214)

7. WCAP-17973-P, Revision 1, "Turkey Point Units 3 and 4 Pressurizer Heater Sleeve Flaw Evaluation to Support Half-Nozzle Repairs," Enclosure 2 (Proprietary), February 28, 2015 (ADAMS Accession No. ML15077A216).
8. WCAP-17973-NP, Revision 1, "Turkey Point Units 3 and 4 Pressurizer Heater Sleeve Flaw Evaluation to Support Half-Nozzle Repairs," Enclosure 1 (Non-Proprietary) February 28, 2015 (ADAMS Accession No. ML15077A215).
9. American Petroleum Institute, API 579-1/ASME FFS-1 (API 579 Second Edition), "Fitness-For-Service," June 2007
10. Summary of February 19, 2015, Public Meeting to Discuss Reactor Pressure Vessel Issues (ADAMS Accession No. ML15096A128).
11. Assessment of BTP 5-3 Protocols, Public Meeting on Reactor Pressure Vessel Issues, February 19, 2015 (ADAMS Accession No. ML15061A065).
12. Part II: Assessment of Impact on Plants Using BTP 5-3 to Estimate $RT_{NDT(u)}$, Public Meeting to Discuss Reactor Pressure Vessel Issues, February 19, 2015 (ADAMS Accession No. ML15061A075).
13. Industry Focus Group Activities Regarding the BTP 5-3 Issue, Public Meeting to Discuss Reactor Pressure Vessel Issues, February 19, 2015 (ADAMS Accession No. ML15061A085).
14. MRP/BWRVIP Evaluation of BTP 5-3, Public Meeting to Discuss Reactor Pressure Vessel Issues, February 19, 2015 (ADAMS Accession No. ML15061A091).
15. Material Orientation Toughness Assessment (MOTA) for the Purpose of Mitigating Branch Technical Position (BTP) 5-3 Uncertainties, Public Meeting to Discuss Reactor Pressure Vessel Issues, February 19, 2015 (ADAMS Accession No. ML15061A095).

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