

UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D.C. 20555-0001

December 1, 2010

- LICENSEE: NextEra Energy Point Beach, LLC
- FACILITY: Point Beach Nuclear Plant, Units 1 and 2
- SUBJECT: SUMMARY OF NOVEMBER 2, 2010, MEETING WITH NEXTERA ENERGY POINT BEACH, LLC, TO DISCUSS ISSUES RELATED TO THE NRC STAFF REVIEW OF THE LICENSE AMENDMENT REQUESTS ASSOCIATED WITH EXTENDED POWER UPRATE AND ALTERNATE SOURCE TERM (TAC NOS. ME0219, ME0220, ME1044, ME1045)

On November 2, 2010, a Category 1 public meeting was held between staff from the U.S. Nuclear Regulatory Commission (NRC) and representatives of NextEra Energy Point Beach, LLC (the licensee), at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to discuss issues related to the Extended Power Uprate (EPU) and Alternate Source Term (AST) license amendment requests (LAR) currently under review by the NRC staff. The specific focus of the meeting was the NRC staff's review associated with the licensee's analyses related to a steam generator tube rupture (SGTR) event.

A list of attendees is attached as Enclosure 1. The licensee's presentation is provided as Enclosure 2. The licensee indicated that the information provided in the presentation could be made publicly available.

Background

The NRC staff issued six requests for additional information related to SGTR for the EPU LAR in an e-mail dated September 8, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102580411). The licensee provided a response to the RAIs in a letter dated September 28, 2010 (ADAMS Accession No. ML102710365).

On October 19, 2010, the NRC staff issued a follow-up draft RAI (ADAMS Accession No. ML103000246) requesting the licensee demonstrate that the radiological consequences predicted using input from the licensing basis SGTR mass release analysis are characteristic of the limiting SGTR scenario. Also, to provide appropriate consideration of the possibility and consequences of a water-filled steam generator with a ruptured tube, and ensure that supporting thermal-hydraulic analyses are consistent with the above regulatory and licensing basis requirements, including a plant-specific evaluation of the limiting single failure.

Discussion

The licensee commenced its presentation by stating that the primary focus of the meeting was to explain to the NRC staff the proposed approach to address the SGTR event analyses associated with the EPU and AST license amendment requests. The licensee's presentation sought to identify a resolution to the NRC staff's SGTR concerns by addressing 1) the low probability occurrence and low safety significance of the analyzed event; 2) the conservatisms

taken in the supplemental SGTR analysis for the design basis event (i.e., SGTR concurrent with a loss of offsite power (LOOP)); 3) the conservatisms taken in the supplemental SGTR analysis for margin to overfill (MTO); and 4) the dose consequences for the SGTR event.

The licensee's SGTR analysis assumes steam release only and is supported by a "realistic" thermal-hydraulic margin to overfill analysis. The NRC staff continues to question the validity of the MTO analysis because it does not appear to include fully conservative inputs and assume a limiting single failure. The objective of the NRC staff's review is to obtain a conservative prediction of radiological consequences consistent with the Point Beach licensing basis (assumes steam release only) and Regulatory Guide (RG) 1.183, which tasks the staff in assuring radiological consequences are based on conservative assumptions.

Conclusions

During the meeting, the licensee provided preliminary results of a radiological consequence analysis of a liquid-filled steam generator and some arguments that its analyzed case is of remote likelihood and beyond the Point Beach design basis.

The NRC staff noted that the licensee's SGTR MTO calculations appeared to be nonconservative. The staff requested that an acceptable MTO analysis should use conservative input assumptions and approved codes. An acceptable MTO analysis is required to validate assumptions about steam release in the proposed licensing basis safety analysis. The staff informed the licensee that it remains justified in requiring performance of acceptable MTO analysis or to evaluate the dose consequences consistent with a liquid release. The NRC staff's position is that if a steam generator becomes water filled, the licensing basis dose calculations may become invalid.

The NRC staff emphasized that the regulations in 10 CFR 50.67 stipulate that the NRC may only approve an AST amendment if an applicant's analysis demonstrates with reasonable assurance that the dose limits specified in 10 CFR 50.67(b)(2) will be met. The NRC staff also noted that RG 1.183, Regulatory Position 5.2.3, states that the numeric values that are chosen as inputs to the radiological consequences analysis should be selected with the objective of determining a conservative postulated dose.

The NRC staff will revise its October 19, 2010, draft RAI to include a postulated scenario that is consistent with Point Beach design basis, but which the staff believes is more likely to occur. The staff will ask the licensee to incorporate this analysis into its licensing basis and revise its AST and EPU licensing bases for the associated radiological consequences.

There were no members of the public in attendance. Public Meeting Feedback forms were not received.

Please direct any inquiries to me at 301-415-3049, or Terry.Beltz@nrc.gov.

AKA with

Terry A. Beltz, Senior Project Manager Plant Licensing Branch III-1 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Docket Nos. 50-266 and 50-301

Enclosures:

1. List of Attendees

2. Slide Presentation Handout Provided by the Licensee

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LIST OF ATTENDEES

NOVEMBER 2, 2010, MEETING WITH NEXTERA ENERGY POINT BEACH, LLC

TO DISCUSS NRC STAFF REVIEWS RELATED TO THE

AST AND EPU AMENDMENTS

FOR THE POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

<u>NRC</u>

NextEra Energy

Allen Howe William Ruland Sher Bahadur Samson Lee Robert Pascarelli Tony Ulses Travis Tate Benjamin Parks Terry Beltz Stanley Gardocki John Parillo Tom Wengert Eva Brown DyLanne Duvigneaud Summer Sun Terry Jones Liz Abbott Steve Hale Jim Costedio

<u>NEI</u>

John Butler

Westinghouse

Uriel Bachrach Dave Dominicis

Enclosure 2

Meeting Handout



Point Beach Steam Generator Tube Rupture (SGTR) NRC Meeting

November 2, 2010

Point Beach - Agenda

- Opening
- NRC Staff Request
- Point Beach Proposed Approach
 - Probability of a SGTR Overfill Event
 - Conservatisms in the Point Beach SGTR Supplemental Analyses for Dose and Overfill
 - Potential Dose Consequences of Overfill
- Conclusion



Point Beach - Opening

- Implementation of AST and EPU LARs represent significant safety and reliability improvements for Point Beach
- AST and AFW implementation planned for Spring 2011
- EPU implementation planned for Spring 2011 (Unit 2) and Fall 2011 (Unit 1)
- Staff review of Point Beach AST and EPU submittals is nearing completion
- NextEra seeks to identify a resolution to recent SGTR question raised commensurate with its safety significance
- Encourage open and active dialogue to define a success path going forward



NRC Staff Request

- 6 RAIs related to SGTR for EPU were issued via email on September 8, 2010
- Responses issued on September 28, 2010
- On October 19, 2010 received follow-up RAI requesting new licensing basis analysis for SGTR concurrent with loss of offsite power (LOOP) and limiting single active failure
 - Include parametric biasing (10 to 12% margin suggested)
 - Assess dose consequences if overfill were to occur



Point Beach – Proposed Approach

- SGTR concurrent with LOOP and limiting active failure is an extremely low probability event (3E-9/year) and of low safety significance
- Supplemental dose and margin to overfill analysis performed in support of the AST and EPU LARs are conservative and support that the AST dose analysis for SGTR is bounding
- Even if a SGTR concurrent with LOOP and limiting active failure is assumed, dose analysis results will be within dose limits for EAB, LPZ and Control Room
- Postulated event scenario is beyond design basis event for PBNP. Plant emergency operating procedures in place for response
- Per 10 CFR 50.67, there is reasonable assurance that the dose consequences for SGTR for the PBNP AST and EPU is what is expected for credible events with margin to the regulatory limits



Postulated Event Scenario is of Very Low Safety Significance

- Probability of Reactor Trip induced LOOP with failure of a Steam Generator Atmospheric Dump Valve (ADV) and SGTR is very low (3E-9/year)
 - Initiating Event SGTR 1.10E-3
 - Failure of atmospheric dump valve 1.02E-3
 - Loss of offsite power after a plant trip 2.99E-3
- SGTR initiating frequency reduced after steam generator replacements and improvements in management programs
 - SGTR contribution to Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) significantly reduced
 - LERF contribution reduced by half
- Scenario is not safety significant from a risk perspective
- Such a low probability event is beyond Current Licensing Basis



Conservatisms in Supplemental SGTR Analyses

- Consistent with PBNP licensing basis, AST dose analysis for SGTR utilized the 30 minute simplified analysis with conservative assumptions to maximize releases
 - Radiological consequences results using the simplified analysis predicted doses that were significantly less that the EAB, LPZ and CR acceptance criteria (by at least a factor of 2)
 - Although not part of the PBNP licensing basis, NextEra performed supplemental margin to overfill (MTO) analysis utilizing aspects from WCAP-10698-P-A methodology consistent with that used for D.C. Cook and Indian Point, and supplemental dose analysis to more accurately model steam releases
 - Summarized in AST RAI responses dated 6/1/09 and EPU RAI responses dated 9/28/10
 - Analysis included some nominal inputs and some conservative bounding inputs
 - Confirmed approximately 2% MTO
 - Confirmed 30 minute simplified dose analysis was conservative, even though event termination would go beyond 30 minutes
 - Based on the mass releases being significantly lower than the simplified licensing basis analysis, the supplemental dose analysis results predicted doses at least a factor of 2 lower than the licensing basis dose analysis
- Licensing basis analysis is conservative for the design basis event (SGTR concurrent with a LOOP) and meets regulatory criteria



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Conservatisms in Supplemental SGTR Analyses for MTO

- Upon receipt of the most recent RAI on 10/19/10, performed preliminary realistic analysis for MTO using nominal inputs to determine amount of conservatism in the supplemental analysis performed
 - Results yielded >850 ft³ MTO margin (~18%)
 - Conservatisms in supplemental analysis are ~16%
 - -- Low Tavg
 - -- Low Feedwater Temperature
 - -- High % Steam Generator tubes plugged
 - -- High AFW flow
 - -- Minimum AFW time delay
 - -- Minimum AFW enthalpy
 - -- High SI flow
- SGTR MTO is greater for EPU conditions than current plant conditions (CLB)
 - EPU does not adversely affect MTO



Estimated Dose Consequences for SGTR coincident with LOOP and Failure of ADV on Affected Steam Generator

- Sensitivities performed using supplemental SGTR dose analysis
 - Summarized in our response to RAI SRXB-6 in letter dated 9/28/10
- ADV assumed to fail in the full open position for 20 minutes until isolated
 - Consistent with Ginna SGTR analysis
- Model accounted for:
 - Increase steam release from ruptured steam generator
 - Increased break flow and flashing fraction due to lower steam generator pressure
- Break flow is terminated at about 65 minutes
- Estimated dose increased by a factor of ~2 and remained less than the simplified licensing basis analysis
 - Doses are below RG 1.183 limits, with margin



Estimated Dose Consequences of Overfill

- Upon receipt of the most recent RAI on 10/19/10, preliminary analyses were performed to assess dose consequences for a SGTR coincident with LOOP and failure of ADV on intact steam generator
 - Transient run with cooldown initiation delayed an additional 15 minutes, resulting in overfill at about 40 minutes
 - Assessed water leaving the ruptured Steam Generator when forced out by break flow entering the ruptured Steam Generator
 - -- SE for Ginna in 1988 (ADAMS Accession No: ML010580114) accepted doses calculated with overfill impact limited to mass of water released prior to break flow termination
 - Break flow is terminated at about 1 hour
 - Total water release ~40,000 lbm (~850 ft³ or ~16% of Steam Generator inventory)
 - All iodine and alkali metal activity in water released due to overfill becomes airborne, even though flashing fraction is less than 0.4 which would limit the amount of activity in water that becomes airborne to 50% or less.
 - Doses are below RG 1.183 limits, with margin



Conclusion

- SGTR concurrent with LOOP and limiting active failure is extremely low probability event (3E-9/year) and of low safety significance
- Supplemental dose and margin to overfill analysis performed in support of the AST and EPU LARs are conservative and support that the AST dose analysis for SGTR is bounding
- Even if a SGTR concurrent with LOOP and limiting active failure is assumed, dose analysis results will be within dose limits for EAB, LPZ and Control Room
- Per 10 CFR 50.67, there is reasonable assurance that the dose consequences for SGTR for the PBNP AST and EPU is what is expected for credible events



There were no members of the public in attendance. Public Meeting Feedback forms were not received.

Please direct any inquiries to me at 301-415-3049, or Terry.Beltz@nrc.gov.

Terry A. Beltz, Senior Project Manager /RA/ Plant Licensing Branch III-1 Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

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ADAMS Accession Numbers: ML103340333

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