



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

January 19, 2011

LICENSEE: Florida Power & Light Company
FACILITY: Turkey Point, Units 3 and 4
SUBJECT: SUMMARY OF NOVEMBER 23, 2010, MEETING WITH FLORIDA POWER & LIGHT COMPANY, ON TURKEY POINT, UNITS 3 AND 4 SPENT FUEL CRITICALITY ANALYSIS LICENSE AMENDMENT REQUEST (TAC NOS. ME4470 AND ME4471)

On November 23, 2010, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of Florida Power & Light Company (FPL, the licensee) at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to discuss the Turkey Point, Units 3 and 4 Spent Fuel Criticality Analysis license amendment request (LAR) 207 currently under NRC review. A list of attendees is provided as Enclosure 1.

The licensee presented information (See Enclosure 2) and provided more specifics on its plan to resubmit LAR 207 to address items, in the draft interim staff guidance (ISG) on completing criticality analyses, that were not addressed in the Spent Fuel Criticality Analysis LAR currently under review. The licensee submitted LAR 207 on August 5, 2010, and FPL received the draft ISG after the LAR was submitted. To account for any deviations between LAR 207 and the draft ISG, FPL presented to the NRC staff work being performed to address the draft ISG and requested feedback from the NRC staff on its approach.

The licensee stated that they plan on using the bounding assembly exit temperature and soluble boron concentration for the depletion analysis. Also, the licensee is targeting k_{eff} less than 0.990, which provides more margin of safety from the previous target k_{eff} of less than 0.995. FPL plans on modifying the spent fuel pool configurations by deleting configurations with one or no metamic inserts but configuring region 2 of the pool with two metamic inserts, three metamic inserts, or one metamic insert and a water hole. The licensee closed by stating that the resubmitted LAR will be changed to match the format of the draft ISG and FPL plans to resubmit by the end of January 2011.

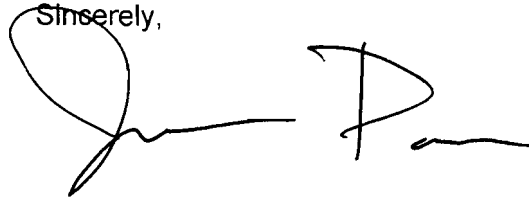
- 2 -

The NRC staff stated that the licensee's plan forward addresses the draft ISG and will delay issuing any requests for additional information until after the LAR is resubmitted.

Members of the public were in attendance. Public Meeting Feedback forms were not received.

Please direct any inquiries to Jason Paige at 301-415-5888, or Jason.Paige@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jason Paige', with a large loop at the beginning and a horizontal line extending to the right.

Jason Paige, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-250 and 50-251

Enclosures:

1. List of Attendees
2. Licensee Handout

cc w/encl: Distribution via Listserv

LIST OF ATTENDEES

NOVEMBER 23, 2010, MEETING WITH FLORIDA POWER & LIGHT

SPENT FUEL CRITICALITY ANALYSIS LICENSE AMENDMENT REQUEST

U.S. Nuclear Regulatory Commission

D. Cunanan
K. Wood

Florida Power & Light

T. Abbatiello
L. Abbott
L. Nicholson
C. Villard
S. Franzone
E. Fuentes

Westinghouse

T. Bishop
V. Kucukboyaci
E. Mercier
D. Smith



Turkey Point Spent Fuel Criticality Analysis for LAR 207

NRC Public Meeting/Conference Call

November 23, 2010

Enclosure 2

Agenda



Introduction

- Turkey Point SFP Criticality Analysis
- Closing Summary

Introduction

- **FPL received draft Interim Staff Guidance (DSS-ISG-2010-01) (ISG) after LAR 207 was submitted**
- **NRC Staff, FPL and Westinghouse met in September 2010 to discuss LAR 207 approach**
- **The objectives today:**
 - Share with Staff additional work being performed
 - Explain how this additional work addresses the draft ISG
 - Obtain feedback on this approach

FPL Participants

- **Liz Abbott (FPL) – Director EPU Licensing**
- **Larry Nicholson (FPL) – Director Fleet Licensing**
- **Claude Villard (FPL) – Nuclear Fuels Director**
- **Steve Franzone (FPL) – EPU LAR Manager**
- **Tom Abbatiello (FPL) – EPU Engineer**
- **Emilio Fuentes (FPL) – Nuclear Fuels Supervisor**
- **Ed Mercier (W) – Manager, U.S. BWR & Criticality**
- **Darrin Smith (W) – Eng Project Mgr**
- **Tracy Bishop (W) – Criticality Analyst**
- **Vefa Kucukboyaci (W) – Criticality Analyst**

Agenda

- Introduction

Turkey Point SFP Criticality Analysis

- Closing Summary

Turkey Point Analysis Approach

- **LAR 207 includes new spent fuel criticality analysis for entire pool**
 - Staff accepted for review
- **LAR 207 analysis was performed addressing known Staff concerns**
- **Due to ISG and self-assessment, additional work is being performed that augments previously submitted analysis**

Turkey Point Analysis Approach

- **Following slides and tables address issues in these categories:**
 - Fuel Assembly Selection
 - Depletion Analysis
 - Criticality Analysis
 - Criticality Code Validation
- **Major changes noted in the following slides**

Turkey Point Fuel Assembly Selection

Item	FPL Approach
Fuel Assembly Selection	Demonstrated limiting fuel assembly properly selected <i>Additional work performed to expand the demonstration of the limiting fuel assembly selection</i>

Fuel Assembly Selection

- **Depletion and criticality calculations performed for each assembly design**
 - Burnup and enrichment range
 - Borated and un-borated cases
 - With and without spacer grids
- **Criticality calculations performed for various configurations**
 - 4 / 4 assemblies with no inserts
 - 4 / 4 assemblies with 2 inserts
 - 3 / 4 assemblies with no inserts
- **Spacer grids explicitly modeled to evaluate their reactivity worth**

Turkey Point Depletion Analysis

Item	FPL Approach
Depletion Uncertainty	5% applied for both borated and unborated cases
Moderator Temperature	<i>Bounding assembly exit temperature</i>
Soluble Boron Concentration	Used maximum cycle average concentration, established from past and expected future operation <i>- updated</i>
Fuel Temperature	Calculated based on other parameters
Specific Power	Used nominal value
Burnable Absorbers & Radial Zoning	Plant specific configurations evaluated to ensure bounded by analysis
Rodded Operation	Other than typical operational maneuvers, plants operate unrodded

Depletion Analysis – Moderator Temperature

- **Moderator temperature used is higher than the core exit temperature**
 - Assuming minimum core flow from safety analysis
- **Temperature used is based on the peak power assembly exit temperature**

Depletion Analysis – Soluble Boron Concentration

- **Included justification for maximum cycle average for both pre-EPU and EPU conditions**
 - Pre-EPU value compared to previous operation
 - EPU value compared to fuel management models

Turkey Point Criticality Analysis

Item	FPL Approach
Axial Burnup Profiles	Discharged fuel assemblies axial burnup profiles as well as from future projections evaluated to establish limiting shape
Simplified Models	Demonstrations included to address rack or fuel assembly geometrical simplifications - <i>expanded</i>
Neutron Absorber	Analysis uses nominal value, tolerance included and statistically added
Interfaces	Justification included - <i>expanded</i>
Tolerance Calculations	Justification included
Normal Conditions	All normal conditions included in analysis - <i>expanded</i>
Accident Conditions	All accident conditions analyzed
Target keff	< 0.990

Criticality Analysis – Simplified Models

- **Evaluated reactivity effects due to fuel geometry changes during depletion**
 - Pellet swelling, clad thinning, oxide thickness
- **Evaluated impact of water displacement due to burnable absorbers, spacer grids**

Criticality Analysis – Interfaces

- **Changed approach from using average bias and uncertainties to bounding bias and uncertainties across interfaces**

Criticality Analysis – Normal Conditions

- **Performed self-assessment of all potential normal conditions**
 - Evaluated reactivity impact of each condition to ensure it remained within bounds of analysis performed

Turkey Point Criticality Code Validation

Item	FPL Approach
Area of Applicability	Matrix included in analysis - <i>updated</i>
Critical Experiments	Multiple experiments evaluated, appropriate experiments included - <i>updated</i>
Actinides	HTC experiments included in benchmark set
Fission Products	<i>Uncertainty (5% of fission product worth) calculated and statistically combined with other uncertainties</i>
Bias and Uncertainty	Statistical analysis follows NUREG/CR-6698 guidance; uncertainty based on population variance
Trend Analysis	Included in analysis, trends identified addressed - <i>updated</i>
Normal Distribution	Statistical analysis included - <i>updated</i>
Lumped Fission Products	Not applicable

Criticality Code Validation – Statistical Treatment

- **Code Validation / Benchmarking re-performed to follow NUREG/CR-6698 guidelines**
- **Set of critical experiments updated**

Criticality Code Validation – Fission Products

- **Uncertainty calculated and statistically combined with other uncertainties**
 - 5% of fission product worth

Turkey Point Other Changes

- **Due to changes presented, SFP configurations from LAR 207 have been modified**
 - Deleted configurations with one or no metamorphic inserts
 - Deleted all but one of the checkerboard configurations
 - Included configurations with three metamorphic inserts, and one empty location and one metamorphic insert
- **Report format will be changed to match draft ISG**

Turkey Point Path Forward

- **Feedback based on current LAR 207 review**
- **Timing of submitting additional work to NRC**
- **Plan to maintain open dialog going forward**

Agenda

- Introduction
- Turkey Point SFP Criticality Analysis



Closing Summary

Closing Summary

- **FPL appreciates Staff participation and interface**
- **Review meeting objectives**
- **Review action items**
- **Summary of path forward**

The NRC staff stated that the licensee's plan forward addresses the draft ISG and will delay issuing any requests for additional information until after the LAR is resubmitted.

Members of the public were in attendance. Public Meeting Feedback forms were not received.

Please direct any inquiries to Jason Paige at 301-415-5888, or Jason.Paige@nrc.gov.

Sincerely,

/RA/

Jason Paige, Project Manager
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Office of Nuclear Reactor Regulation

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DATE	01/05/11	01/05/11	01/19/11	01/19/11

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