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L-11-246

10 CFR 50.46

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001SUBJECT:
Perry Nuclear Power Plant, Unit No.1
Docket No. 50-440, License No. NPF-58
Report of Changes Pursuant to 10 CFR 50.46

On July 20, 2011, Global Nuclear Fuel – Americas, LLC issued two error notifications regarding the emergency core cooling system (ECCS) - loss of coolant accident (LOCA) methodology used for the Perry Nuclear Power Plant (PNPP). Pursuant to 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors," FirstEnergy Nuclear Operating Company (FENOC) is notifying the Nuclear Regulatory Commission (NRC) of these errors.

The attachment contains a summary of the 10 CFR 50.46 changes and errors, including the two most recent errors, applicable to the GE14 fuel in use at PNPP. The summation of the absolute values of these changes and errors results in a value that meets the definition of a significant change as defined by 10 CFR 50.46(a)(3)(i). Therefore, pursuant to 10 CFR 50.46(a)(3)(ii), NRC notification of the two recent errors is required within 30 days.

One error is associated with the input coefficients used to direct the deposition of gamma energy produced by the fuel, determining whether it would heat the fuel rod, fuel cladding, fuel channel, or control rod structural materials. This resulted in an overprediction of the heat deposited in the fuel channel (post-scrum) and an underprediction of the heat deposited in the fuel. Evaluations have been performed and a bounding effect on peak clad temperature (PCT) has been determined. For PNPP, the PCT increases by 25 degrees Fahrenheit (°F).

The second error is associated with the assumptions on the distribution of gamma heating pre-LOCA. The contribution from gamma heating to the fuel channel was minimized. For simplification, the energy was assumed to be deposited in the fuel rods prior to the LOCA, and then adjusted such that the correct heat deposition

Perry Nuclear Power Plant, Unit No. 1
L-11-246
Page 2

was applied after the scram. Not accounting for this power generation outside of the fuel rod tended to suppress the hot bundle power required to meet the initial operating planar linear heat generation rate. Further, there is a small effect on the initial conditions for the balance of the core as these are set in relation to the hot bundle condition. The energy distribution during the pre-scram phase was updated with the appropriate energy distribution. For PNPP, the PCT decreases by 40°F.

As a result of incorporating these, and previously reported changes and errors, the PNPP PCT is 1550°F and continues to satisfy the 10 CFR 50.46(b)(1) criteria of PCT not to exceed 2200°F.

Evaluation of the two aforementioned errors indicate continued compliance with the 10 CFR 50.46(b) acceptance criteria. The evaluation also accounted for the uncertainties in the analysis methods and inputs indicated in 10 CFR 50.46(a)(1)(i). Therefore, a reanalysis is not required.

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at (330) 761-6071.

Sincerely,



Mark B. Bezilla

Attachment:

Perry Nuclear Power Plant 10 CFR 50.46 Changes and Errors

cc: NRC Region III Administrator
NRC Resident Inspector
NRC Project Manager

Attachment
L-11-246

Perry Nuclear Power Plant 10 CFR 50.46 Changes and Errors
Page 1 of 1

Vendor Notification Number	Summary of Change/Error	Licensing Basis Peak Clad Temperature (PCT) Impact	Licensee Report of Notification (Accession No.)
2001-02	Impact of SAFER ¹ pressure rate inconsistency error.	PCT impact for GE14 fuel is +5 degree Fahrenheit (° F).	ML020710641
2002-01	Impact of SAFER core spray injection elevation error.	PCT impact for GE14 fuel is +15° F.	ML030710170
2002-02	Impact of SAFER bulk water level error.	PCT impact for GE14 fuel is 0° F.	ML030710170
2002-04	Impact of SAFER04 computer platform change.	PCT impact for GE14 fuel is 0° F	ML030710170
2002-05	Impact of error in WEVOL ² calculation of downcomer free volume.	PCT impact for GE14 fuel is 0° F.	ML030710170
2003-01	Impact of SAFER level/ volume table error.	PCT impact for GE14 fuel is +5° F.	ML040710502
2003-03	Impact of SAFER initial steam separator pressure drop error.	PCT impact for GE14 fuel is 0° F.	ML040710502
2003-05	Impact of postulated post-LOCA ³ hydrogen-oxygen recombination.	PCT impact for GE14 fuel is 0° F.	ML040710502
2006-01	Impact of top peaked power shape for small break LOCA analysis.	PCT impact for GE14 fuel is 0° F.	ML062490520 ML070390113
2011-02	Impact of database error for heat deposition for 10X10 fuel bundles.	PCT impact for GE14 fuel is +25° F.	This submittal.
2011-03	Impact of updated formulation gamma heat deposition to channel wall for 10X10 fuel bundles.	PCT impact for GE14 fuel is -40° F.	This submittal.
TOTAL	Summation of the absolute values of the changes/errors.	90° F	

- Notes: 1. SAFER – Name of the code developed by General Electric Company which calculates long term reactor vessel inventory and peak cladding temperature for LOCA and loss of inventory events.
2. WEVOL – Name of a code that is used to calculate the weight and volume inputs for jet pump plant SAFER analyses.
3. LOCA – Loss of coolant accident.