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

March 5, 2013

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 - REQUEST FOR ADDITIONAL INFORMATION REGARDING 30-DAY REPORT FOR EMERGENCY CORE COOLING SYSTEM MODEL CHANGES PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.46 (TAC NO. ME8237)

Dear Mr. Pacilio:

By letter dated March 21, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12081A083), Exelon Generation Company, LLC (Exelon) reported an error correction discovered in the Emergency Core Cooling System evaluation model, or in the application of such a model, that affects the peak cladding temperature calculation at Three Mile Island Nuclear Station, Unit 1. The letter reports two error corrections of an absolute value magnitude of 80 degrees Fahrenheit, impacting the analysis for a postulated large break loss-of-coolant accident. The submittal dated March 21, 2012, was supplemented by letter dated December 12, 2012 (ADAMS Accession No. ML12349A175). The supplement dated December 12, 2012, referenced an additional letter from AREVA NP Inc. (AREVA), which was submitted to the NRC on December 6, 2012 (ADAMS Accession No. ML12342A381).

The Nuclear Regulatory Commission staff has been reviewing the submittal and has determined that additional information is needed to complete its review. The specific questions are found in the enclosed request for additional information (RAI). The questions were sent via electronic transmission on February 12, 2013, to Mr. Thomas Loomis, of your staff. A revised draft version of the RAI was sent electronically to Mr. Loomis on March 4, 2013. The draft questions were sent to ensure that the questions were understandable, the regulatory basis was clear, and to determine if the information was previously docketed. The NRC staff requests that a response to this RAI be submitted within 30 days of the date of this letter.

Please contact me at 301-415-2833, if you have any questions.

Sincerely,

Peter Bamford, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure:
As stated

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

REGARDING THREE MILE ISLAND NUCLEAR STATION, UNIT 1

30-DAY REPORT FOR EMERGENCY CORE COOLING SYSTEM MODEL CHANGES

PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.46

DOCKET NO. 50-289

By letter dated March 21, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12081A083), Exelon Generation Company, LLC (Exelon, the licensee), sent a notice reporting a change or error discovered in an evaluation model or in the application of such a model that affects the peak cladding temperature (PCT) calculation for Three Mile Island Nuclear Station, Unit 1 (TMI-1). This report was submitted pursuant to the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.46, which requires, in part, that licensees report a change in the evaluation model used resulting in a significant change in PCT (greater than 50 degrees Fahrenheit). As described in the statements of consideration published in the *Federal Register* (FR), the intent of this requirement is to enable the Nuclear Regulatory Commission (NRC) staff to establish the safety significance of this change (53 FR 35996-36005).

The submittal dated March 21, 2012, was supplemented by letter dated December 12, 2012 (ADAMS Accession No. ML12349A175). The December 12, 2012, letter referenced an additional letter from AREVA NP Inc. (AREVA), which was submitted to the NRC on December 6, 2012 (ADAMS Accession No. ML12342A381). The following questions pertain to the AREVA submittal, insofar as it applies to the TMI-1 report.

1. For the analyses completed pertaining to the Emergency Core Cooling System (ECCS) bypass error for the lowered loop design, a 2.506-ft peak power location was used, and the analyses for the ECCS bypass error for the raised loop design used a 9.536-ft peak power location. In the December 6, 2012, supplemental letter, the effects of the end-of-bypass timing error are expressed in terms of liquid inventory available to reach the lower plenum and initiate a bottom-up core reflood. The effects of an adiabatic heatup, which is terminated by the core reflood, are also discussed. In consideration of these phenomena, it would appear that a higher elevation in the core would be a more limiting location to evaluate the effects of an error associated with end-of-bypass timing.

   Provide information to demonstrate that the bottom-peaked power shape being used for the lowered loop design is conservative and/or appropriate.

2. After evaluating a 177 fuel assembly (FA) lowered loop plant with column weldments modeled for a 205 FA plant, details of the column weldments for a 177 FA plant were developed. The model for column weldments of a 177 FA plant were then used for the analyses of a raised loop plant. Two 177 FA raised loop cases showed that the newly developed column weldments increased PCT, for an unruptured fuel segment, by 3 degrees Fahrenheit.

   It was also reported that the column weldments in a lowered loop plant increased PCT by 11.5 degrees Fahrenheit for an unruptured fuel segment and 26.2 degrees

Fahrenheit for a ruptured fuel segment. This result was bounded by generically estimating the effect of column weldments to be an increase in PCT of 80 degrees Fahrenheit.

Column weldments in a raised loop plant increased PCT by 8.9 degrees Fahrenheit for an unruptured segment, which is less than the effect seen in the lowered loop design.

a. Provide justification to show that analyzing column weldments modeled for a 177 FA plant has an effect on PCT of the same magnitude in a lowered loop plant as in a raised loop plant.

b. Describe the nodalization for the column weldments used in the RELAP5 analyses.

c. Provide simplified drawings to compare the column weldment design for a 205 FA plant to the column weldments for the 177 FA plant.

March 5, 2013

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Sincerely,
/ra/
Peter Bamford, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-289
Enclosure: As stated
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ADAMS Accession Number: ML13044A321 * concurrence via memo **via email

OFFICE	LPLI-2/PM	LPLI-2/LA**	SRXB/BC	LPL1-2/BC
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