

10 CFR 50.46

NMP1L2980

December 12, 2014

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001Nine Mile Point Nuclear Station Unit 1
Renewed Facility Operating License No. DPR-63
NRC Docket No. 50-220

Subject: 10 CFR 50.46 30-Day Report

- References:
- 1) Letter from Paul Swift (CENG) to U.S. Nuclear Regulatory Commission, "10 CFR 50.46 ECCS Evaluation Model Annual Report for 2013," dated January 30, 2014
 - 2) Letter from GE Hitachi Nuclear Energy (GEH) to Constellation, "10 CFR 50.46 Notification Letter 2014-01, Nine Mile Point Nuclear Station (Unit 1) [GE11 Fuel]," dated December 5, 2014
 - 3) Letter from GE Hitachi Nuclear Energy (GEH) to Constellation, "10 CFR 50.46 Notification Letter 2014-02, Nine Mile Point Nuclear Station (Unit 1) [GE11 Fuel]," dated December 5, 2014
 - 4) Letter from GE Hitachi Nuclear Energy (GEH) to Constellation, "10 CFR 50.46 Notification Letter 2014-03, Nine Mile Point Nuclear Station (Unit 1) [GE11 Fuel]," dated December 5, 2014
 - 5) Letter from GE Hitachi Nuclear Energy (GEH) to Constellation, "10 CFR 50.46 Notification Letter 2014-04, Nine Mile Point Nuclear Station (Unit 1) [GE11 Fuel]," dated December 5, 2014

The purpose of this letter is to submit a 30-day 10 CFR 50.46 report for Nine Mile Point Nuclear Station, Unit 1 (NMP1). The most recent annual 50.46 Report for NMP1 (Reference 1) provided the cumulative Peak Cladding Temperature (PCT) errors.

Subsequent to the issuance of Reference 1, four vendor notifications of Emergency Core Cooling System (ECCS) model error/changes that are applicable to NMP1 have been issued (References 2 through 5). No ECCS-related changes or modifications have occurred at NMP1 that affect the assumptions of the ECCS analyses. The vendor notifications are summarized below:

1) Notification 2014-01: SAFER04A E4-Code Changes of Neutral Impact

Several accumulated observations were docketed on software control tracking tools which led to changes in the evaluation model SAFER04A. These changes are regarded as code maintenance items. Representative sensitivity calculations indicate a PCT change of +10°F for GE11 fuel.

2) Notification 2014-02: SAFER04A E4-Mass Non-Conservatism

An error was discovered where there was an indication that the expected system mass diverges from the actual calculated system mass. This occurs when upper plenum liquid mass and core spray flow rate is low; system mass is gradually lost due to core spray being discarded, resulting in marginally less ECCS flow credited as reaching the core. Representative sensitivity calculations indicate a PCT change of -30°F for GE11 fuel.

3) Notification 2014-03: SAFER04A E4-Minimum Core DP Model

Due to calculation of a non-physically low pressure differential (Δp) for droplet flow above a two-phase level in the core, an earlier version of the model imposed a minimum core Δp . It has been observed that for cores with greater voiding (more steam flow), this minimum Δp could be non-conservative, actually driving the steam flow slightly, and offering inappropriate steam cooling benefit above the core two phase level. To correct this error two changes were made to the code including removal of the imposition of the minimum core Δp and the addition of an explicit core Δp calculation without regard to droplet condition. Representative sensitivity calculations indicate a PCT change of +15°F for GE11 fuel.

4) Notification 2014-04: SAFER04A E4-Bundle/Lower Plenum CCFL Head

A counter current flow limitation (CCFL) is applied on the interface between the hot bundle and the lower plenum. The pressure head applied at that location is based on the liquid water level in the bundle. It was found, upon exercising the routine to define CCFL, the output would replace the pressure head with a value revised by that calculation, resulting in a representation of pressure head slightly different from that of the calculated water level in the bundle. The iteration scheme for CCFL has been fixed in the SAFER04A E4 model so that, consistently, the level head is applied whenever CCFL is calculated in that location. Representative sensitivity calculations indicate a PCT change of +20°F for GE11 fuel.

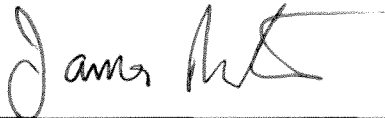
The net combined impact on PCT of the errors/changes described above is +15°F for the GE11 fuel resulting in a Licensing Basis PCT of 2165°F, which remains below the acceptance criteria of 2200°F.

As discussed in 10 CFR 50.46(a)(3)(i), this 30-day report is required because the absolute magnitudes of the respective temperature changes is greater than 50°F.

Two attachments are included with this letter that provide the current NMP1 10 CFR 50.46 status. Attachment 1, "Peak Cladding Temperature Rack-Up Sheet for GE11 Fuel, NMP1," provides information regarding the PCT for the limiting large break LOCA analysis evaluations for NMP1. Attachment 2, "Assessment Notes, NMP1," contains a detailed description for each change or error reported.

There are no commitments contained in this letter. If you have any questions, please contact Ron Reynolds at 610-765-5247.

Respectfully,



James Barstow
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachments: 1) Peak Cladding Temperature Rack-Up Sheet for GE11 Fuel, NMP1
2) Assessment Notes, NMP1

cc: USNRC Administrator, Region I
USNRC Senior Project Manager, NMP
USNRC Senior Resident Inspector, NMP

ATTACHMENT 1

10 CFR 50.46

**“Acceptance criteria for emergency core cooling systems
for light-water nuclear power reactors”**

**Thirty-Day Report of the Emergency Core Cooling System Evaluation
Model Changes and Errors**

Assessments as of December 12, 2014

Peak Cladding Temperature Rack-Up Sheet, NMP1

Nine Mile Point Nuclear Station, Unit 1

PLANT NAME: Nine Mile Point Unit 1
ECCS EVALUATION MODEL: SAFER/GESTR-LOCA/CORCL
REPORT REVISION DATE: 12/12/14
CURRENT OPERATING CYCLE: 21

ANALYSIS OF RECORD

Evaluation Model:

1. NEDC-23785-1-PA Rev. 1, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-Of-Coolant Accident Volume II, SAFER - Long Term Inventory Model for BWR Loss-Of-Coolant Analysis," October 1984.
2. NEDC-23785-1-PA Rev. 1, "The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant Accident Volume III, SAFER/GESTR Application Methodology," October 1984.
3. NEDC-30996P-A, "SAFER Model for Evaluation of Loss-of-Coolant Accidents for Jet Pump and Non-jet Pump Plants, Volume I, SAFER - Long Term Inventory Model for BWR Loss-of-Coolant Analysis," October 1987.
4. NEDC-30996P-A, "SAFER Model for Evaluation of Loss-of-Coolant Accidents for Jet Pump and Non-jet Pump Plants, Volume II, SAFER Application Methodology," October 1987.

Calculations:

1. NEDC-31446P, Supplement 5, "Nine Mile Point Unit 1 Supplemental Loss-of-Coolant Accident Analysis For Small Break and revised DBA LOCA," January 2001.
2. 0000-0144-8266-SRLR, Rev. 1, "Supplemental Reload Licensing Report for Nine Mile Point 1 Reload 22 Cycle 21," March 2013.

Fuel: GE11

Limiting Fuel Type: GE11

Limiting Single Failure: ADS Valve

Limiting Break Size and Location: 5.4615 ft² Double-Ended Guillotine in a Recirculation Discharge Pipe + Bottom Head Drain Line

Reference Peak Cladding Temperature (PCT)

PCT: 2150°F

MARGIN ALLOCATION

A. PRIOR LOCA MODEL ASSESSMENTS

10 CFR 50.46 Report dated January 30, 2014 (See Note 1)	$\Delta\text{PCT} = 0^\circ\text{F}$
NET PCT (GE11)	2150°F

B. CURRENT LOCA MODEL ASSESSMENTS

Notification 2014-01 (See Note 2)	$\Delta\text{PCT} = +10^\circ\text{F}$
Notification 2014-02 (See Note 2)	$\Delta\text{PCT} = -30^\circ\text{F}$
Notification 2014-03 (See Note 2)	$\Delta\text{PCT} = +15^\circ\text{F}$
Notification 2014-04 (See Note 2)	$\Delta\text{PCT} = +20^\circ\text{F}$
Total PCT Change from Current Assessments	$\sum\Delta\text{PCT} = +15^\circ\text{F}$
Cumulative PCT Change from Current Assessments	$\sum \Delta\text{PCT} = 75^\circ\text{F}$
NET PCT (GE11)	2165°F

ATTACHMENT 2

10 CFR 50.46

**“Acceptance criteria for emergency core cooling systems
for light-water nuclear power reactors”**

**Thirty-Day Report of the Emergency Core Cooling System Evaluation
Model Changes and Errors**

Assessments as of December 12, 2014

Assessment Notes, NMP1

Nine Mile Point Nuclear Station, Unit 1

1. Prior LOCA Assessment

Updated LOCA/MAPLHGR analyses were performed for both GE11 and GNF2 fuel in support of operating Cycle 21. These analyses maintained the calculated PCT at 2150°F and superseded all prior LOCA assessments. These analyses incorporated all ECCS/LOCA methodology errors and changes known/resolved at that time (as of March 2013).

[Reference 1: Letter from Paul Swift (CENG) to U.S. Nuclear Regulatory Commission, “10 CFR 50.46 ECCS Evaluation Model Annual Report for 2013,” dated January 30, 2014.]

[Reference 2: 0000-0144-8266-SRLR, Rev 1, “Supplemental Reload Licensing Report for Nine Mile Point 1 Reload 22 Cycle 21,” March 2013.]

2. Current LOCA Model Assessment

Subsequent to the 2014 Annual 50.46 report (see Note 1), four vendor notifications were received. The first notification (Reference 1) addresses several accumulated updates to the SAFER04A model. These code maintenance changes result in a PCT change of +10°F for GE11 fuel. The second notification (Reference 2) corrected a logic error that has been isolated, occurring with an indication that the expected system mass diverges from the calculated actual mass. This error affects the ECCS flow credited as reaching the core. Correction of this error results in a -30°F PCT change to GE11 fuel. The third notification (Reference 3) addresses an error with the imposed minimum pressure differential (Δp) for droplet flow above a two-phase level in the core. This error can offer an inappropriate steam cooling benefit above the core two phase level. To correct this error, an explicit core Δp calculation is applied without regard to droplet condition resulting in a PCT change of +15°F to GE11 fuel. The fourth notification (Reference 4) addresses an incorrect pressure head representation when defining the counter current flow limitation (CCFL). Correction of this error results in a +20°F PCT change to GE11 fuel.

[Reference 1: Letter from GE Hitachi Nuclear Energy (GEH) to Constellation, “10 CFR 50.46 Notification Letter 2014-01, Nine Mile Point (Unit 1) [GE11 Fuel],” dated December 5, 2014]

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