November 20, 2015

Mr. Jerald G. Head
Senior Vice President, Regulatory Affairs
GE-Hitachi Nuclear Energy Americas, LLC
P.O. Box 780, M/C A-18
Wilmington, NC 28401-0780

SUBJECT: RESPONSE TO GE HITACHI NUCLEAR ENERGY LETTER MFN 15-066 DATED AUGUST 26, 2015 – CLARIFICATION OF LIMITATION AND CONDITION 23 FOR NEDC-33173P, "APPLICABILITY OF GE METHODS TO EXPANDED OPERATING DOMAINS" (TAC NO. MF6665)

Dear Mr. Head:

On August 19, 2015, during the review of Grand Gulf license amendment request (LAR) for maximum extended load line limit analysis plus (MELLLA+), the U.S. Nuclear Regulatory Commission (NRC) staff discussed with GE Hitachi Nuclear Energy (GEH) and Entergy limitation and condition (L&C) 23 for NEDC-33173P, "Applicability of GE Methods to Expanded Operating Domains" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML083530224), Entergy requested that GEH provide a letter to the NRC clarifying L&C 23 for NEDC-33173P. In response to the Entergy request, GEH submitted the clarification letter in reference 1.

In reference 1, GEH confirmed its commitment to gather and evaluate data on GEH/Global Nuclear Fuel (GNF) nuclear methods and to report the information to the NRC as required by L&C 23 for NEDC-33173P. Through this letter, the staff agrees with GEH's interpretation in reference 1.

By reference 2, NRC staff issued the final safety evaluation (SE) for NEDC-33173P. Subsequent SEs covering supplements and revisions to NEDC-33173P did not affect L&C 23.

L&C 23 for NEDC-33173P reads as follows:

> 23. MELLLA+ Eigenvalue Tracking (Section 8.3)
>
> In the first plant-specific implementation of MELLLA+, the cycle-specific eigenvalue tracking data will be evaluated and submitted to NRC to establish the performance of nuclear methods under the operation in the new operating domain. The following data will be analyzed:

- Hot critical eigenvalue,
- Cold critical eigenvalue,
- Nodal power distribution (measured and calculated traveling-in-core (TIP) comparison)
- Bundle power distribution (measured and calculated TIP comparison),
- Thermal margin,
- Core flow and pressure drop uncertainties, and
- The Minimum Critical Power Ratio (MCPR) Importance Parameter (MIP) Criterion (e.g., determine if core and fuel design selected is expected to produce a plant response outside the prior experience base).

Provision of evaluation of the core-tracking data will provide the NRC staff with bases to establish if operation at the expanded operating domain indicates: (1) changes in the performance of nuclear methods outside the extended power uprate (EPU) experience base; (2) changes in the available thermal margins; (3) need for changes in the uncertainties and NRC-approved criterion used in the safety limit minimum critical power ratio (SLMCPR) methodology; or (4) any anomaly that may require corrective actions.

The staff does not view L&C 23 for NEDC-33173P as a plant-specific licensee requirement. As noted in the closing paragraph of L&C 23, the L&C was included in the SE to provide further assurance that GEH/GNF methods were performing adequately in the MELLLA+ power-flow domain. We understand that, if GEH discovers a significant anomaly, immediate action would be taken to enter the condition into the Corrective Action Program and process it as a potential reportable condition under Part 21 of Title 10 of the *Code of Federal Regulations* (10 CFR).

The staff agrees with GEH that the L&C 23 reporting requirement as stated in the SE was intended to apply to the first plant implementing MELLLA+. When this L&C was created, the staff did not know that a relatively low power density plant (Monticello) was going to be the first to implement MELLLA+. The staff therefore agrees with GEH that it would be better to use data from a higher power density plant (Grand Gulf) to fulfill the L&C 23 reporting requirement. Also, it may be difficult to collect sufficient data from one plant for one cycle. Thus, the staff agrees with GEH that the next few plants (4 plants) making the MELLLA+ transition will better represent the fleet.

The staff expects the L&C report and submission to occur after the first full operating MELLLA+ cycle which contains substantial TIP information generated at statepoints within the MELLLA+ domain. The staff finds it acceptable that GEH might not be completing the final report for 3 to 6 years.

In the interim, GEH agreed to present, at each annual NRC Technology Update Meeting, the status of fulfillment of the L&C 23 requirement until the final report is submitted. The staff finds this acceptable.

GEH requested elimination of the following MIP parameter from L&C 23 and provided the following clarification as the basis for elimination.

- The MIP Parameter (e.g., determine if core and fuel design selected is expected to produce a plant response outside the prior experience base).

The MIP is an estimating parameter that indicates the effect that the flatness of the bundle power distribution has on the SLMCPR. Sufficient calculations using the approved Monte Carlo methodology have been performed for reduced flows to indicate that the resulting flattening of the power distribution is producing the expected effect on the calculated SLMCPR values. The plant data from operation in the MELLLA+ domain does not provide any information concerning the accuracy or usefulness of the MIP parameter in estimating the SLMCPR values calculated by the Monte Carlo methodology. In fact, such estimations with MIP are not needed because the Monte Carlo calculations are being performed. Examining the MIP for the current 10x10 fueled MELLLA+ cores provides no additional value with respect to nuclear methods.

The staff finds the clarification for the elimination of MIP Parameter from L&C 23 acceptable because TIP data has no information about MIP.

References:

1. Letter, James F. Harrison to Document Control Desk (U.S. NRC), Subject: Clarification of Limitation and Condition 23 for NEDC-33173P, “Applicability of GE Methods to Expanded Operating Domains,” MFN 15-066 dated August 26, 2015 (ADAMS Accession No. ML15238A687).

2. Letter, T. B. Blount (U.S. NRC) to J. G. Head (GEH), Subject: Final Safety Evaluation for GE Hitachi Nuclear Energy Americas, LLC Licensing Topical Report NEDC-33173P, “Applicability of GE Methods to Expanded Operating Domains” (TAC No. MD0277) dated July 21, 2009 (ADAMS Accession No. ML083530224).

Please contact Joseph A. Golla at (301) 415-1002, if you have any questions on this subject.

Sincerely,

/Kevin Hsueh for RA/

Mirela Gavrilas, Deputy Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

cc: See next page

Project No. 710

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ADAMS Accession No.: ML15292A421; *email concurrence **NRR-106**

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