



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

December 19, 2013

Vice President, Operations
Entergy Operations, Inc.
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 – SUPPLEMENTAL INFORMATION NEEDED FOR ACCEPTANCE OF LICENSING ACTION, REQUEST TO ALLOW OPERATION IN EXPANDED MAXIMUM EXTENDED LOAD LINE LIMIT ANALYSIS PLUS DOMAIN (TAC NO. MF2798)

Dear Sir or Madam:

By letter dated September 25, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13269A140), Entergy Operations, Inc. (Entergy, the licensee), submitted a license amendment request for the Grand Gulf Nuclear Station, Unit 1 (GGNS). The letter dated September 25, 2013, contains sensitive unclassified non-safeguards information (proprietary) and, accordingly, those portions are withheld from public disclosure.

The proposed amendment would revise the Operating License and Technical Specifications to allow plant operation in the expanded Maximum Extended Load Line Limit Analysis Plus (MELLLA+) domain. The acceptance review was performed to determine if there is sufficient technical information in scope and depth to allow the U.S. Nuclear Regulatory Commission (NRC) staff to complete its detailed technical review. The acceptance review is also intended to identify whether the application has any readily apparent information insufficiencies in its characterization of the regulatory requirements or the licensing basis of the plant.

Consistent with Section 50.90 of the Title 10 of the *Code of Federal Regulations* (10 CFR), an amendment to the license (including the technical specifications) must fully describe the changes requested, and following as far as applicable, the form prescribed for original applications. Section 50.43 of 10 CFR addresses the content of the technical information required. This section stipulates the submittal address the design and operating characteristics, unusual or novel design features, and principal safety considerations.

The NRC staff has reviewed your application and concluded that the information delineated in the enclosure to this letter is necessary to enable the NRC staff to make an independent assessment regarding the acceptability of the proposed amendment request in terms of regulatory requirements and the protection of public health and safety and the environment.

In order to make the application complete, the NRC staff requests that Entergy supplement the application to address the information requested in the enclosure by January 3, 2014. This will enable the NRC staff to complete its detailed technical review. If the information responsive to the NRC staff's request is not received by the above date, the application will not be accepted for review pursuant to 10 CFR 2.101, and the NRC staff will cease its review activities

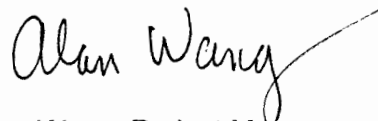
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associated with the application. If the application is subsequently accepted for review, you will be advised of any further information needed to support the NRC staff's detailed technical review by separate correspondence.

The information requested and associated time frame in this letter were discussed with Mr. Steve Ward of your staff on December 4, 2013.

If you have any questions, please contact me at (301) 415-1445 or Alan.Wang@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "Alan Wang". The signature is written in a cursive style with a long, sweeping underline that extends to the right.

Alan Wang, Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure:
Supplemental Information Request

cc w/encl: Distribution via Listserv

SUPPLEMENTAL INFORMATION REQUEST NEEDED
FOR ACCEPTANCE OF LICENSING ACTION
LICENSE AMENDMENT REQUEST TO ALLOW OPERATION IN EXPANDED
MAXIMUM EXTENDED LOAD LINE LIMIT ANALYSIS PLUS DOMAIN
ENTERGY OPERATIONS, INC.
GRAND GULF NUCLEAR STATION, UNIT 1
DOCKET NO. 50-416

By letter dated September 25, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13269A140), Entergy Operations, Inc. (Entergy, the licensee), submitted a license amendment request (LAR) for the Grand Gulf Nuclear Station, Unit 1 (GGNS). The letter dated September 25, 2013, contains sensitive unclassified non-safeguards information (proprietary) and, accordingly, those portions are withheld from public disclosure.

The proposed amendment would revise the Operating License and Technical Specifications to allow plant operation in the expanded Maximum Extended Load Line Limit Analysis Plus (MELLLA+) domain. By letter dated September 17, 2007 (ADAMS Accession No. ML072190207), the U.S. Nuclear Regulatory Commission (NRC) staff approved the original topical report (TR) NEDC-33006P, "General Electric Boiling Water Reactor [BWR] Maximum Extended Load Line Limit Analysis Plus," Revision 2, with the proviso that licensees must provide NRC-approved plant-specific automatic backup stability protection for MELLLA+ operation.

By letter dated March 28, 2012 (ADAMS Accession No. ML120400319), the NRC issued license Amendment No. 188 for GGNS to replace the existing Average Power Range Monitor (APRM) subsystem of the Neutron Monitoring System with a digital General Electric - Hitachi (GEH) Nuclear Measurement Analysis and Control (NUMAC) Power Range Neutron Monitoring System (PRNMS), with the Option III algorithm for MELLLA. However, as noted in the NRC's safety evaluation (SE), the proviso for demonstrating automatic backup stability protection to enable NRC staff approval of MELLLA+ operation, as required by the September 2007 TR, was incomplete. The NRC staff noted that the licensee's response did not include an equivalent of a NUREG-0800, Branch Technical Position (BTP) 7-19, Revision 5, "Guidance for Evaluation of Diversity and Defense-in-Depth in Digital Computer-Based Instrumentation and Control Systems" (Reference 1) analysis to demonstrate adequate diversity for vulnerabilities to common-cause failures to the Oscillation Power Range Monitor (OPRM) instrument's Detect and Suppress Solution-Confirmation Density (DSS-CD) algorithm trip function. On page 54 of the NRC's March 28, 2012, SE, the staff stated, in part, that, "Therefore, the NRC staff did not evaluate the adequacy of the diversity of DSS-CD trip function in consideration of potential common-cause failures within the PRNMS."

Following completion of the installation of the PRNMS, Entergy was to evaluate the performance of PRNMS at GGNS. The NRC staff noted on page 2 of the SE dated

Enclosure

March 28, 2012, that because this licensing action with MELLLA+ does not enable the DSS-CD trip output, the staff had limited its review of the DSS-CD trip to (1) confirm that the licensee will use its local indications to obtain operating experience, and (2) evaluate and confirm that the presence of the confirmation density algorithm would not adversely affect the performance of the required safety functions. This continued performance evaluation information was not available or referenced in the September 25, 2013, GGNS LAR and thus the technical analysis included within it does not provide an evaluation, assessment, observation, or cited information on the diversity and defense-in-depth of the MELLLA+ trip function that satisfies the acceptance criterion in BTP 7-19.

The use of common software for normal and backup stability can disable both functions in case of common-cause software failure. Thus, the NRC staff needs the following supplemental information to complete the acceptance review:

1. On page xiii of the September 17, 2007, MELLLA+ TR states: *"Therefore, the NRC staff concluded that manual backup stability protection is not appropriate and a NRC-approved automatic backup stability protection must be implemented for MELLLA+ operation."* Please provide the required supplemental information on the automatic backup stability protection.
2. Please provide hardware/software technical information as emphasized in the reference document GEH NEDC-33075P, pages 1-2. This information should specifically document the hardware and software and/or firmware designs as per any variations from MELLLA to the MELLLA+ algorithm.
3. Demonstrate the common-cause failure vulnerabilities and the defense-in-depth for the detection algorithms and the backup stability solution. It is unclear if the primary and backup stability trip functions for MELLLA+ use the same software and are therefore subject to software common-cause failure. Please provide a discussion of the postulated Software Common-Cause Failure (SWCCF) with its possible consequences on diversity and defense-in-depth.
4. If a postulated SWCCF condition disables an appropriate response, then what documented diverse means not subject to the same common-cause failure would be available to provide adequate protection? Please discuss the proposed design with respect to how it meets the guidance of BTP 7-19. Provide a detailed analysis meeting the guidance contained in BTP 7-19.

Reference:

1. U.S. Nuclear Regulatory Commission, NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition," (SRP) Branch Technical Position (BTP) 7-19. "Guidance for Evaluation of Diversity and Defense-in-Depth in Digital Computer Based Instrumentation and Control Systems," Revision 5, March 2007 (ADAMS Accession No. ML070550072).

associated with the application. If the application is subsequently accepted for review, you will be advised of any further information needed to support the NRC staff's detailed technical review by separate correspondence.

The information requested and associated time frame in this letter were discussed with Mr. Steve Ward of your staff on December 4, 2013.

If you have any questions, please contact me at (301) 415-1445 or Alan.Wang@nrc.gov.

Sincerely,

/ra/

Alan Wang, Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure:
Supplemental Information Request

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ADAMS Accession No. ML13345A182

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DATE	12/12/13	12/11/13	12/17/13	12/19/13

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