

June 27, 2008

Vice President, Operations  
Entergy Operations, Inc.  
Grand Gulf Nuclear Station  
P.O. Box 756  
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SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 - RELIEF REQUEST GGNS-ISI-004  
TO EXTEND INSERVICE INSPECTION INTERVAL (TAC NO. MD7477)

Dear Sir or Madam:

By application dated December 3, 2007 (GNRO-2007-00075), Entergy Operations, Inc. (Entergy, the licensee), requested approval from the U.S. Nuclear Regulatory Commission (NRC) to extend the current inservice inspection (ISI) interval for piping and certain components at Grand Gulf Nuclear Station, Unit 1 (GGNS), to the end of its 16th refueling outage (RF-16). In the licensee's Request for Alternative GG-ISI-004, the requested extension is for approximately 4 months beyond the 1-year extension allowed by Section XI, IWB-2412(b), of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). Additional information was provided by Entergy in its supplemental letter dated May 8, 2008 (GNRO-2008-00038).

Based on the enclosed safety evaluation, the NRC staff determined that to impose the ASME Code requirements on the licensee would be a hardship or unusual difficulty without a compensating increase in the level of quality and safety and that, because of the previous examination results, the licensee's proposed alternative to extend the second 10-year ISI interval to the end of the upcoming refueling outage, which is currently about 4 months beyond the automatic 1-year extension, provides reasonable assurance of structural integrity of the subject welds. Therefore, the NRC staff concludes that the licensee's proposed alternative is authorized pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(ii) for the second 10-year ISI interval for GGNS. All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Sincerely,

/RA/

Thomas G. Hiltz, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosure:  
Safety Evaluation

cc w/encl: See next page

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**ADAMS Accession No. ML081570002**

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Grand Gulf Nuclear Station

(6/10/2008)

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND 10-YEAR INTERVAL INSERVICE INSPECTION

REQUEST FOR RELIEF GGNS-ISI-004

GRAND GULF NUCLEAR STATION, UNIT 1

ENTERGY OPERATIONS, INC.

DOCKET NUMBER 50-416

1.0 INTRODUCTION

By application dated December 3, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML073380107), Entergy Operations, Inc. (Entergy, the licensee), requested approval from the U.S. Nuclear Regulatory Commission (NRC) to extend the current second 10-year inservice inspection (ISI) interval for piping and certain components at Grand Gulf Nuclear Station, Unit 1 (GGNS), to the end of its 16th refueling outage (RF-16). In the licensee's Request for Alternative GGNS-ISI-004, the requested extension to the second ISI interval is for approximately 4 months beyond the 1-year extension allowed by Section XI, IWB-2412(b), of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (the ASME Code). Additional information was provided by the licensee in its supplemental letter dated May 8, 2008 (ADAMS Accession No. ML081330203).

The second 10-year ISI interval for GGNS started on June 1, 1997, and, with the automatic 1-year extension, would end on May 31, 2008. The relief request would have the interval end at the completion of RF-16, which is scheduled to end in the fall of 2008, approximately 4 months after the end of the second 10-year interval with the 1-year extension. These extensions will not affect the start of the third 10-year ISI interval, which is June 1, 2007.

The ASME Code of record for the second 10-year interval ISI program is the 1992 Edition with no Addenda.

2.0 REGULATORY REQUIREMENTS

The ISI of the ASME Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Code and applicable addenda as required by paragraph 50.55a(g), "Inservice inspection requirements," of Title 10 of the *Code of Federal Regulations* (i.e., 10 CFR 50.55a(g)), except where specific relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). Pursuant to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if: (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would

result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a (b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

### 3.0 RELIEF REQUEST (RR) GGNS ISI-004

#### ASME Code Components

The ASME Code components Category B-F, Item B5.10, Pressure Retaining Dissimilar Metal Welds in Reactor Pressure Vessel (RPV) Nozzles B13-N04F-KB and B13-N05B-KB

#### ASME Code Requirements

The ASME Code requirements are in Section XI, Table IWB-2412-1 that defines an ISI interval to be 10 years in duration and IWB-2412(b) that allows extending the interval for one year to coincide with a plant outage.

#### 3.1 Licensee's Proposed Alternative (As stated in the licensee's application)

Pursuant to 10 CFR 50.55a(a)(3)(i), Entergy Operations, Inc. (Entergy) requests authorization to extend the current ISI interval to include an additional refueling outage, which will be the sixteenth refueling outage (RF-16) currently scheduled for fall 2008 for components B13-N04F-KB and B13-N05B-KB ([ASME Code, Section XI, Table IWB-2500-1,] category B-F). The requested extension is approximately four months beyond the one-year extension allowed by ASME [Code,] Section XI, IWB-2412(b). This alternative will not affect the start date of the third interval.

#### 3.2 Licensee's Basis for Relief Request (As stated in the licensee's application)

During the fifteenth refueling outage (RF-15) Entergy attempted to examine nozzle to safe end welds B13-N04F-KB and B13-N05B-KB and determined none of the required ultrasonic examination could be performed on the subject welds due to the weld configuration/profiles. An attempt was made to perform the needed surface preparation but a large amount of grinding (flat topping) was needed. Because of the critical nature of grinding on [ASME Code] class 1 piping welds and the high dose rates in the RPV (reactor pressure vessel) annulus region, it was determined that an engineering evaluation/structural analysis was necessary in order to safely plan and execute the preparation of the welds.

Due to the critical nature of the task and after communication with the NRC staff, Entergy decided to defer the examinations and prepare for this work until after RF-15. The surface preparation (grinding) along with the weld examinations will be performed during the next refueling outage (RF-16).

### 3.3 Evaluation

In November 2002 ASME Code, Section XI, Appendix VIII, Supplement 10 was implemented in 10 CFR 50.55a. This required licensees to implement the Electric Power Research Institute's (EPRI) performance demonstration initiative (PDI) requirements when examining dissimilar metal (DM) safe-end-to-penetration and pipe-to-safe-end welds. The PDI methodology requires that the weld crown is flush with the base material allowing adequate scanning on top of, and over, the butter material of the weld. Flush is defined as no more than a 1/32-inch gap between the ultrasonic search unit and the examination surface for the entire length of the weld. Excessive weld crown/weld toe, weld shrinkage, tapers, or transitions on the outside surface of the prepared weld could create a limited ultrasonic examination by lift-off of the transducer.

In its application and supplemental letter, the licensee requested to extend the second 10-year ISI interval to the end of the upcoming RF-16, which is about 4 months beyond the 1-year extension allowed by ASME Code, Section XI, IWB-2412(b). The purpose of the extension is to include, as required by the ASME Code, the inspection of the welds B13-N04F-KB and B13-N05B-KB in the second 10-year interval. If the relief request is approved, RF-16, which is currently scheduled for the fall of 2008, would be included in the second 10-year ISI interval to examine the subject nozzle-to-safe-end welds.

The licensee stated it had planned to examine the two nozzle-to-safe-end welds B13-N04F-KB and B13-N05B-KB during RF-15. However, the licensee was unable to perform any of the required ultrasonic examinations on the subject welds due to the weld configuration/profiles. The licensee stated that the subject welds required surface preparation prior to their examination to meet the requirements of a PDI qualified examination, which is discussed above. This surface preparation was not required for the inspection of these welds in the first 10-year ISI interval.

The licensee stated it attempted to perform the necessary surface preparation prior to the RF-15 examinations; however, the weld preparation effort was greater than the licensee had expected. Had the licensee continued the weld preparation in RF-15 without reassessing its effort by an engineering evaluation, the welds may have been ground too thin and would have required repairs for continued power operation.

With this extension, the licensee will be able to perform an engineering evaluation/structural analysis in order to safely plan and execute the preparation of the subject welds for examination during RF-16. If the NRC staff did not approve the 4-month extension of the second ten-year ISI interval, the licensee would have to shut the plant down to specifically prepare and examine the subject welds prior to the end of the second 10-year ISI interval on June 1, 2008. Requiring the licensee to comply with the ASME Code requirements would cause an unnecessary challenge on the plant's systems possibly causing damage to various components (e.g., pumps, valves, pipe supports, etc.). Therefore, the NRC staff has determined that to require the licensee to

perform the examinations prior to the end of the second 10-year ISI interval would be a hardship without a compensating increase in the level of quality and safety.

For weld 1B13-N04F-KB, the licensee stated it has previously volumetrically examined the weld six times since October 1986 and no reportable indications associated with intergranular stress-corrosion cracking (IGSCC) were found during these examinations. The licensee stated that weld 1B13-N05B-KB has been volumetrically examined four times since October 1986 and no reportable indications associated with IGSCC were found. The last volumetric examinations on welds 1B13-N04F-KB and 1B13-N05B-KB occurred on May 5, 1995, and May 20, 1992, respectively. Although there will be 13 years and 16 years between examinations, of welds 1B13-N04F-KB and 1B13-N05B-KB, respectively, the licensee has examined other welds and has found no IGSCC indications, in any safe-end-to-penetration and pipe-to-safe-end DM welds examined under ASME Code, Section XI, Appendix VIII, Supplement 10 at GGNS. Based on previous examination results, there is reasonable assurance that if significant service-induced degradation were occurring in the subject welds, evidence of it would have been detected. Therefore, based on the previous examination results, the NRC staff has determined that the licensee's proposed alternative to extend the second 10-year ISI interval by 4 months will provide reasonable assurance of the structural integrity of welds 1B13-N04F-KB and 1B13-N05B-KB.

#### 4.0 CONCLUSION

The NRC staff reviewed the licensee's proposed alternative to extend the current second 10-year ISI interval beyond the 1-year extension allowed by ASME Code, Section XI, IWB-2412(b) in order to give the licensee time to prepare and plan for the examinations of the subject nozzles. Based on the NRC staff review of the licensee's application and submittal letter, the NRC staff concludes that to impose the ASME Code requirements on the licensee would be a hardship or unusual difficulty without a compensating increase in the level of quality and safety. The NRC staff further concludes that based on the previous examination results, the licensee's proposed alternative to extend the second 10-year ISI interval to include RF-16 provides reasonable assurance of the structural integrity of welds 1B13-N04F-KB and 1B13-N05B-KB. Therefore, the NRC staff further concludes that the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the GGNS second 10-year ISI interval.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in the subject requests for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: T. McLellan

Date: June 27, 2008