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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO FIRST TEN-YEAR INTERVAL INSERVICE INSPECTION RELIEF REQUESTS

ENTERGY OPERATIONS, INC.

GRAND GULF NUCLEAR STATION, UNIT 1

DOCKET NO. 50-416

1.0 INTRODUCTION

The Technical Specifications for Grand Gulf Nuclear Station, Unit 1, state that the inservice inspection and testing of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been g anted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used 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 difficulties 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 nd access provisions and the preservice 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 ten-year interval 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) on the date twelve months prior to the issuance of the operating license, subject to the limitations and modifications listed therein. Based on the operating license date of July 1, 1985, the applicable edition of Section XI of the ASME Code for the Grand Gulf Nuclear Station, Unit 1, first 10-year inservice inspection (ISI) interval is the 1977 Edition through Summer 1979 Addenda. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME

Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law when relief will not endanger life, property, or the common defense and security, and is otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed.

The licensee, Entergy Operations, Inc., submitted Relief Requests I-00022 (Revision 0), I-00009 (Revision 2), and I-00010 (Revision 4), in individual letters dated July 3, 1991, for the first 10-year ISI interval. The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the requests for relief in the following sections.

2.0 EVALUATION

The information provided by the licensee in support of the requests for relief from impractical requirements has been evaluated and the bases for granting relief from those requirements are documented below:

A. Request for Relief No. I-00009, Revision 2, Examination Categories C-G and C-C, Pump Casing and Pump Integral Attachment Welds

NOTE: The pump casing welds were evaluated in the Safety Evaluation (SE) dated July 22, 1986. Revision 1 included Examination Category C-C, Pump Integral Attachment Welds and was evaluated in an SE dated December 23, 1987. Relief Request I-00009, Revision 2, addresses three 3/4 inch component connection welds that have been deleted from Relief Request I-00009. These welds are exempt from ISI examination under provisions of ASME Section XI, subparagraph IWC-1220(c). Deletion of the three welds reduces the stated percentage of accessible welds requiring surface examination to 82% (from 87%).

Two welds were added to the request for relief since the Revision 1 submittal. Pump Casing E22-HPCS welds SB-2 and SB-3 were included in Revision 0 and inadvertently omitted from Revision 1 of the relief request. Therefore, they were replaced in Revision 2.

Revision 2 of Relief Request I-00009 is also revised to delete specific reference to frequency of system testing. The frequency of system testing is defined in the Technical Specifications and is not required as a basis for relief.

The staff concludes that I-00009, Revision 2, does not require additional technical evaluation. The revision is basically a clarification of existing conditions and the premise for granting relief has not changed. Pursuant to 10 CFR 50.55a(g)(6)(i), relief remains granted as requested.

B. Request for Relief No. I-00010, Revision 4, Examination Categories B-J, C-F, and B-K-1, Class 1 and 2 Pressure Retaining Piping and Class 1 Integral Attachment Welds

NOTE: Request for Relief No. I-00010 (Revision 3), was previously evaluated by the staff in an SE dated September 27, 1990. The changes in Revision 4 do not affect the results of the previous evaluation. All revisions are to Table 1 of the relief request and are summarized as follows:

A. The pipe size as shown in Table 1, Item 8, for Weld No. G026-FW-17 was corrected to read 24 inch NPS.

B. Relief was requested to perform partial volumetric examination (83% and 85% respectively) on the following two welds:

Weld No. G004W18 (Item 72)
Weld No. G012W54 (Item 73)

C. The licensee has determined that the following six welds are not subject to system hydrostatic testing under the rules of IWC-5210(a):

Weld No. G004-8-8-1 (Item 3)
Weld No. G004-7-8-4 (Item 13)
Weld No. G004-7-8-9 (Item 14)
Weld No. G004-7-8-8 (Item 15)
Weld No. G001-W1 (Item 21)
Weld No. G004W18 (Item 72)

The staff concludes that, based on previous staff evaluations and the extent of volumetric examination performed on Items 72 and 73, pursuant to 10 CFR 50.55a(g)(6)(i), relief should remain granted as requested.

C. Request for Relief No. I-00022, Examination Category F-A, Reactor Pressure Vessel Support Skirt

Code Requirement: Section XI, Table IWF-2500-1, Examination Category F-A, requires supports of components chosen for examination under IWB, IWC, and IWD to receive a VT-3 visual examination in accordance with Table IWF-2500-1 and IWF-2500-2 as defined by Figure IWF-1300-1.

Licensee's Code Relief Request: Relief is requested from performing the Code-required VT-3 visual examination of the ID area of the RPV support skirt.

Licensee's Basis for Requesting Relief: The licensee states that the RPV support skirt encloses numerous vessel components (control rod drive housings, incore housings, core differential pressure nozzle, and drain nozzle) and their supports and snubbers. The vessel bottom head and support skirt ID are insulated with 3-inch thick removable and permanent insulation. Radiation dose rates are expected to average 150 mR/hr in this area. Total estimated man-rem exposure for removal and reinstallation of all removable insulation panels is 88.2 rem. This would gain access to approximately 27% of the bolting and 32% of the skirt surface. Removal of permanent insulation is required for 100% visual examination. Total man-rem exposure associated with removal and replacement of permanent insulation is estimated to be 132.3 rem.

In addition to the ALARA considerations, the licensee states that all support skirt welds below the bottom head-to-vessel support skirt weld and the surfaces of the skirt vertical members received a magnetic particle (MT) examination in accordance with ASME Section III, Class 1 requirements.

The design basis failure mode of the support skirt is buckling caused by primary bending compressive stress. After forming, the material has ample ductility and is expected to exhibit significant plastic deformation prior to fracture. Any service induced damage would be associated with buckling failure and would be evident during visual examination of the skirt exterior.

Licensee's Proposed Alternative Examination: None. The external surfaces and bolting are subject to visual examination once every ten year interval.

Staff Evaluation: The Code requires that the RPV support skirt receive a VT-3 visual examination from the support base plate/building structure connection to within one bottom head thickness of the RPV head (Reference IWF-1300-1). The design of the RPV support skirt ID precludes VT-3 visual examination based on personnel exposure. Visual examination of the ID surface is therefore, impractical to perform. Imposition of this Code requirement would necessitate redesigning and fabricating a new RPV support skirt and would cause a burden on the licensee that would not be compensated by the increase in safety. The design basis failure mode of the support skirt is buckling caused by primary bending compressive stress. Any service induced damage would be associated with buckling failure and would be evident during visual examination of the skirt exterior. Elimination of the Code-required visual ID examination will not significantly affect the assurance of the continued structural integrity. Pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted as requested.

3.0 CONCLUSION

Paragraph 10 CFR 50.55a(g)(4) requires that components (including supports) that are classified as ASME Code Class 1, 2, and 3 meet the requirements, except design and access provisions and preservice requirements, set forth in applicable editions of ASME Section XI to the extent practical within the limitations of design, geometry, and materials of construction of the components. Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee determined that conformance with certain Code requirements is impractical for his facility and submitted supporting information.

Pursuant to 10 CFR 50.55a(g)(6)(i), the staff has determined that certain requirements of the Code are impractical for Grand Gulf Nuclear Station, Unit 1, and relief may be granted for the issues described in Requests for Relief No. I-00009 (Revision 2), I-00010 (Revision 4), and I-00022 (Revision 0). Such relief is authorized by law, will not endanger life, property, or the common defense and security, and is otherwise in the public interest. This relief is being granted giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

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