



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST FOR AUTHORIZATION TO UPDATE INSERVICE INSPECTION PROGRAMS TO THE 1992
AND PORTIONS OF THE 1993 ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI
ARKANSAS NUCLEAR ONE, UNITS 1 AND 2, DOCKET NOS. 50-313 AND 50-368
GRAND GULF NUCLEAR STATION, DOCKET NO. 50-416
RIVER BEND STATION, DOCKET NO. 50-458
WATERFORD 3 STEAM ELECTRIC STATION, DOCKET NO. 50-382

1.0 INTRODUCTION

The Technical Specifications for Arkansas Nuclear One (ANO), Units 1 and 2, Grand Gulf Nuclear Station (GGNS), River Bend Station, and Waterford Steam Electric Station, Unit 3 state that the inservice inspection (ISI) 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 granted 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, when authorized by the Nuclear Regulatory Commission (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 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 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 ter-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) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

ENCLOSURE

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 and subject to Commission approval.

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, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed. In a letter dated January 5, 1996, the licensee proposed updating inservice inspection program plans to the 1992 edition and portions of the 1993 addenda of the ASME Boiler and Pressure Vessel Code, Section XI for Arkansas Nuclear One, Units 1 and 2, Grand Gulf Nuclear Station, River Bend Station, and Waterford Steam Electric Station, Unit 3. The licensee provided additional information in its letters dated July 12, 1996, and November 1, 1996.

The current ASME Code editions for the four plants are the following: ANO, Unit 1 is 1980 Edition through Winter 1981 Addenda, ANO, Unit 2 is 1986 Edition, GGNS is 1977 Edition through Summer 1979 Addenda, and River Bend and Waterford, Unit 3 is also 1980 Edition through Winter 1981 Addenda.

2.0 EVALUATION

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the information provided by the licensee in support of its proposed alternative to update inservice inspection program plans to the 1992 edition and portions of the 1993 addenda of the ASME Boiler and Pressure Vessel Code, Section XI for Arkansas Nuclear One, Units 1 and 2, Grand Gulf Nuclear Station, River Bend Station, and Waterford Steam Electric Station, Unit 3.

The licensee, Entergy Operations Inc., has proposed the following alternative in lieu of updating to the 1989 edition of the ASME Code:

- 1) update to the 1992 Edition of ASME Section XI,
- 2) use the pressure testing requirements of the 1993 Addenda of ASME Section XI,
- 3) defer the 10-year program update until June 1, 1997, for ANO-1 and GGNS,

- 4) defer implementation of Code Subsection IWE, *Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Plants*, until required by 10 CFR 50.55a,
- 5) defer implementation of Code Subsection IWL, *Requirements for Class CC Concrete Components of Light-Water Cooled Plants*, until required by 10 CFR 50.55a,
- 6) defer implementation of Code Appendix VIII, *Performance Demonstration for Ultrasonic Examinations Systems*, and use the 1989 Edition of Appendix I, *Ultrasonic Examinations*, of ASME Section XI, until Appendix VIII is required by 10 CFR 50.55a, and
- 7) update the ANO-2 program plan to these requirements at the end of the current interval in March of 2000.

The staff reviewed the licensee's compilation of the differences among the subject editions of Section XI that the licensee considers to be increases or decreases in Code requirements. These differences are listed in Attachment 2 to the licensee's submittal dated July 12, 1996. There are a total of 184 changes from the 1989 Edition of the Code to the 1992 Edition, including the 1993 Addenda that eliminates 10-year hydrostatic testing. Of these changes, 77 were editorial and 8 were errata (changes that correct an error in printing), and 51 were changes that did not change the actual requirements for inservice inspection. The remaining 48 changes either increased requirements for ISI or reduced requirements for ISI. These changes and the licensee's assessment of each are as follows:

Increased Requirements

IWA-1400(p) - This paragraph adds requirements for the Owner to record areas in components where flaws exceeded the acceptance criteria and evaluations by analysis were performed to allow continued operation. Also, the time cycle or component life determined by the evaluation is required to be recorded. Although it is inherent that such evaluations be recorded and available for use in later Owner's activities, the Code has never specifically stated the requirement. This change implements the assumed obvious.

IWA-1500-1, Table 2120(c) - These reference the 1990 Edition and 1991 Addenda (N626a-1991) of ASME N626 which requires that Authorized Inspection Agencies (AIAs) be accredited by ASME. Other changes to the Table are an errata correction to the OM-6 and OM-10 references and an editorial reorganization of the references. This is an increase from the 1989 Edition because AIAs now require accreditation by ASME.

IWA-2120(c) - By the addition of this paragraph, the AIA is required to be accredited by ASME in accordance with ASME N626. Accreditation by ASME of the Inspection Agency has not been required in the past.

IWA-2210 - The paragraph adds general requirements applicable to VT-1, VT-2, and VT-3 visual examinations. ASME Section V, Article 9, is invoked with new technical requirements and procedure demonstration. The change invokes ASME Section V, Article 9, for additional controls on visual inspections and now requires procedure demonstration. Additional controls have been placed on lighting requirements, especially when using battery operated portable lights.

IWA-2210-1 Table - The table imposed controls on minimum illumination, maximum direct examination distance, and maximum procedure demonstration lower case character height, with specified mils for each visual method. These controls provide additional requirements that define direct versus remote examination. This combined with procedure demonstration results in more inspections being performed using the remote method that may have been previously classified as direct.

IWA-2211 - All inspection methodology for the VT-1 has been deleted and is contained in the new 2210. IWA-2211 only states the purpose of the VT-1. More technical controls on procedure qualification, examination distance, and lighting has been added.

IWA-2212 - The reference to functional test has been eliminated and the generic term "system pressure test" is used. Additionally, performance of the VT-2 examination in accordance with IWA-5240 has been replaced with a generic reference to IWA-5000. The examination distance and illumination requirements contained in IWA-2210-1 are imposed. More technical controls on procedure qualification, examination distance, and lighting has been added.

IWA-2213 - This paragraph was revised to identify the function and purpose of the VT-3 examination. The additional controls that were added with the change to IWA-2210 impose the additional requirements for VT-3 that were previously not required. More technical controls on procedure qualification, examination distance, and lighting has been added.

IWA-2321/IWA-2322 - These paragraphs revise the specification of minimum visual acuity for non-destructive examination (NDE) personnel. The non-quantitative Jaeger J-1 is replaced with the quantitative Anellen 20/25 (6.25 minute included angle). This is related to any parts of Section XI where nondestructive examinations are required. These paragraphs provide for a more specific quantitative method for determining visual acuity. This is the current method used by most medical facilities.

IWA-2322/2323/Appendix VII - The requirements for Level NDE personnel to repeat the basic examination for recertification have been deleted. This is compatible with current practice. This change also adds the practical (hands-on) examination for certification of Level III's. It includes revisions to both IWA-2300 and Appendix VII (NDE examiner's qualifications). It also includes minor editorial cleanup of Appendix VII. This is related to any parts of Section XI where NDEs are required. Although this change deletes the requirement to repeat the basic portion of the examination during recertification, it is still an increase in requirements due to the addition

of the practical examination during initial examinations. Repeated demonstration of basic NDE skills are inappropriate for individuals that are redemonstrating of their knowledge and skills at an upper technical level.

IWA-4130 - This change introduces the repair plan and recognizes the difference between the repair program and repair plan. The amount of information required to contained in the repair program and repair plan has increased, but the Code recognizes that the repair program may be comprised of a set of documents (procedures) that contain the required information. Repair plans are now required in addition to the repair program. The repair program may be the generic document that controls repair/replacement activities, but the repair plan is specific to the activity being performed.

IWA-4500 - This total rewrite updates the Section XI welding requirements for exempting welds from postweld heat treatment when it is required by the construction code. It deletes confusing terms and makes the Section XI repair welding requirements compatible with the Section III (design and construction) welding requirements. Added controls have been placed on activities such as size of preheated area, baking of electrodes, and specific requirements have been established for repair without postweld heat treatment of Class MC and CC components. Regardless of the changes made, proof of acceptance is through qualification of the process. Methods and requirements of qualification have not been reduced.

IWA-4513.1-1 Figure - The change renumbers Figures 4513-1 to 4513-1.1 and clarifies how halfbead is used in conjunction with the temperbead, and placed a limitation on the depth of the prepared cavity to 1/2 thickness maximum. The clarification of how to combine the halfbead and temperbead techniques is editorial, but the limitation on cavity depth is a more stringent change.

IWA-5213(a) - This paragraph establishes test condition hold time for system leakage tests. The 1989 Edition had no hold times for the system leakage test, but the system leakage test was only performed on Class 1 boundaries during each refueling outage. The change requires no hold time provided the system has been in operation for at least 4 hours, or requires a 10 minute hold time for noninsulated systems and 4 hours for insulated. Also, the system leakage test is used on Class 1, 2, and 3, where the Class 2 and 3 were previously inservice or functional tests which had hold times comparable to the new hold times for the new system leakage test. The new requirements could result in additional hold times based on the condition of the system when tested. For Class 2 and 3 systems, the new requirements are more restrictive.

IWA-5224(b) - This paragraph requires hydrostatic tests of systems that have multiple safety functions to be tested in separate tests combining the components based on minimum required design pressure ratings. Previous Codes required test boundaries to be based on components classifications. This change results in more individual tests and prevents testing components rated at higher pressures to conditions equal to the rating of the lowest pressure component within the test boundary.

IWB/C/D-2420 - Addition of IWD-2420 provides new requirements for successive examinations that are similar to IWC-2420. This adds requirements for Class 3 that are consistent with Class 2.

IWC-1221/1222 - This change requires exemption size to be determined based on cumulative sizes for components with multiple connections, possibly increasing the number of components that require examination that were previously exempt.

IWC-2430(a) - This paragraph changes the method of selecting items for additional examination, requiring some knowledge of the failure mechanism, materials, and service in the selection.

IWD-2430 - The change adds requirements for additional examinations if flaws are found in Class 3 welds, making Class 3 consistent with Class 2.

IWF-2430(a) and (c) - The changes to these paragraphs add requirements for larger numbers of supports examined if flaws are found during the initial inspection and expands the number of supports that are potential for examination to an unlimited quantity until the failure mechanism is identified.

Appendix IV - The changes concern eddy current examinations and, although it is an increase in requirements, it is not an increase for Entergy because the Entergy pressurized water reactors (PWRs) steam generator examinations pursuant to the plant Technical Specifications exceed the requirements.

Appendix VII - A practical examination is now required for Level III examiners.

Reduced Requirements (Safety impact in italics).

IWA-4331 - The paragraph eliminates the requirements for surface examination of the removal cavity when the full thickness of the weld is removed and the backside of the joint is inaccessible. This makes IWA-4331 consistent with Section III, Division 1, NB-4453.1. Prior to the change, all defect removal areas required a surface examination (liquid penetrant or magnetic particle) before welding, even if removal resulted in a hole through the item being repaired. The revised Code has eliminated the surface examination requirement if removal results in a hole through the item to be repaired and the backside is inaccessible for cleaning. *The change increase safety by preventing holes in the area of the weld.*

IWA-4700(b)(7) - The change exempts seal welds from the hydrostatic test requirements following a repair by welding. This change eliminates seal welds from hydrostatic testing when the seal weld is installed as part of a repair or replacement. Seal welds are not pressure boundary welds. *No change in safety.*

IWA-4700(c) - This deletes subparagraph (c) which excluded repair welds that were made without required postweld heat treatment from the hydrostatic exemption. Repair welds that were made to Code provisions that exempted postweld heat treatment when it was required by the construction code always required hydrostatic testing and the normal exemptions from hydrostatic testing were not applied. By the change, this requirement has been removed and if the repair meets the exemption criteria, it is now also exempt from hydrostatic testing. *No change in safety.*

IWA-5250(a)(2) - The paragraph was revised to eliminate the requirement to remove all bolting from the leaking connection. The revised Code only requires one bolt nearest the leak to be removed, and remaining bolts removed if the initially removed bolt is corroded. *No change in safety.*

IWA-5250(a)(2) - The 1993 Addenda added restrictions to exclude gaseous systems from the requirements to remove bolting when leakage is detected at mechanical connections. *No change in safety because pure gas does not cause degradation of bolting.*

IWA-5260 - The title was changed and now the instrumentation requirements of IWA-5261 through IWA-5265 apply only to the system hydrostatic tests rather than the system leakage tests. *No change in safety because instrumentation for system leakage tests is controlled under the Quality Assurance program required by 10 CFR Part 50, Appendix B.*

IWA, B, C, and D-5000 and corresponding 2500-1 Tables for Class 1, 2, and 3 - The 1993 Addenda replaced the hydrostatic test with the system leakage test. This change eliminates the requirements for hydrostatic testing with a less severe test. *No change in safety because the hydrostatic tests are no longer required.*

IWB-2430(a) - The method of selecting additional welds to examine in the event a flaw is identified in regularly scheduled welds has been changed such that an engineered approach is used, though the total number of items examined may be less. *Increases safety by making the selection more appropriate.*

IWB-2430(b) - When the additional welds are examined, if new flaws are identified, the remainder of all like items shall be examined, but only those areas that are subject to the same type of flaw. The total number of items examined may be reduced from the 1989 Edition. *Increases safety by making the selection more appropriate.*

IWB-2500-1 (B-G-1) - This changes the required examination from surface to visual (VT-1) for reactor vessel closure head nuts and specifies IWB-3517 for visual criteria. This change treats reactor vessel head nuts similar to pressurizer and steam generator nuts. *No change in safety based on industry experience and the capabilities of visual examinations.*

IWB-5210(b) - This paragraph was changed to permit the contained fluid in the system (including outside water sources) to be used as the pressurizing medium, whereas previously reactor coolant had to be used. *No change in safety.*

IWB/C/D-1220 and IWD-2500-1 Table - The changes add to the exemptions for Classes 1, 2, and 3, integral attachments of supports and restraints that are inaccessible due to being encased in concrete, buried underground, or encapsulated by guard pipe. *No change in safety because the change simply eliminates the need for granting reliefs based on impracticalities as allowed by 10 CFR 50.55a(g)(6)(i).*

IWC-2430(a)/(b) - These paragraphs change the selection of additional examination areas when unacceptable flaws are found in additional examinations by requiring an engineering approach. *Increases safety by making the selection more appropriate.*

IWC-5222(d) - The change permits the Class 2 portion of the boiling water reactor (BWR) main steam system to be hydrostatically tested with the Class 1 test provided the Class 2 portion is not capable of being isolated from the Class 1 portion by a boundary valve. This allows a lower pressure test to be performed, but the 1993 Addenda eliminates the requirements for hydrostatic testing. *No change in safety because the detection of through wall leakage is not diminished by the reduction in test pressure.*

IWC-5222(g) - The change added certain vent and drain lines to the hydrostatic test boundary. However, the 1993 Addenda eliminates the requirements for hydrostatic testing. *No change in safety.*

IWD-2500-1 (D-A) - The change excludes a small population of integral attachments that have been inspected previously, primarily those that are internal to the component, if any. This change makes Class 3 consistent with Classes 1 and 2. *No change in safety because there are few examinations that will be eliminated and the requirements are now consistent with Classes 1 and 2.*

IWD-5223(f) - The change excludes open-ended piping of discharge of safety and relief valves from hydrostatic pressure testing. These were already eliminated from the system leakage test pressure boundary. *No change in safety because the hydrostatic test requirement is eliminated by the 1993 Addenda.*

IWF-1230 - The change eliminates requirements for examination of supports where physically inaccessible (incased in concrete, buried or encapsulated in guard pipe). *No change in safety as this makes reliefs based on impracticality unnecessary.*

IWF-2220(b) - Preservice inspection may now be performed prior to heatup and cooldown if the system operates at a temperature of 200 °F or less and

eliminates certain preservice examination after repairs for those same systems. *No change in safety because at temperatures below 200 °F, thermal growth is of no concern and either no, or minimal, thermal loads are imposed on the supports.*

IWF-2500-1 Table - The total number of supports examined during a 120-month interval is reduced through grouping similar supports for examination purposes. *No change in safety because representative supports will be examined and industry data indicates that representative supports can demonstrate any generic problems.*

The staff's review of the differences revealed that these differences do not adversely affect implementation of the ISI program and finds Entergy's assessment of the impact on safety for those changes that reduced requirements acceptable. The licensee has taken no specific exception to the increased requirements as listed above. Therefore, the staff concludes that use of the 1992 Edition of Section XI provides an acceptable level of quality and safety.

The licensee has requested to upgrade the pressure testing requirements of their ISI program plans to meet the requirements of the 1993 Addenda of ASME Section XI. A review of the pressure testing portions of the 1993 Addenda of Section XI indicates that the Addenda incorporates Code Case (CC) N-498-1, *Alternative Rules for 10-year System Hydrostatic Testing for Class 1, 2, and 3 Systems*, into the Code.

Code Case N-498-1 has been authorized for use by the NRC without condition. Information prepared in conjunction with CC N-498-1 notes that the system hydrostatic test is not a test of the structural integrity of the system, but rather an enhanced leakage test. Piping components are designed for a number of loadings that would be postulated to occur under the various modes of plant operation. Hydrostatic testing only subjects the piping components to a small increase in pressure over the design pressure and, therefore, does not present a significant challenge to pressure boundary integrity since piping dead weight, thermal expansion, and seismic loads, which may present far greater challenge to the structural integrity of a system than fluid pressure, are not part of the loading imposed during a hydrostatic test. Accordingly, hydrostatic pressure testing is primarily regarded as a means to enhance leakage detection during the examination of components under pressure, rather than as a measure to determine the structural integrity of the components.

CC N-498-1 encompasses Class 1, 2, and 3 components. In lieu of 10-year hydrostatic pressure testing at or near the end of the 10-year interval, CC N-498-1 requires a visual examination (VT-2) to be performed in conjunction with system leakage testing in accordance with paragraph IWA-5000. The 1993 Addenda of the ASME Code incorporated CC N-498-1. The change can eliminate considerable delay time and occupational radiation exposure to the licensee. Any added assurance provided by a hydrostatic test can be offset or negated by many factors such as removal of Code safety valves, off-normal system conditions, outage extensions, and resource requirements to set up special

equipment and gauges. Industry experience indicates that, in general, leaks are not discovered as a result of hydrostatic tests pressures that could propagate an existing flaw; rather, leakage is generally identified when the system is at normal operating pressure. Considering the offsets, and that leakage is generally identified while systems are in service, the changes in the 1993 Addenda that eliminate the 10-year hydrostatic tests will provide an acceptable level of quality and safety pursuant to 10 CFR 50.55a(a)(3)(i).

Entergy has requested to defer updating the 10-year ISI program plans for ANO-1 and GGNS until June 1, 1997. The current intervals at ANO-1 and GGNS end in December 1996, and January 1997, respectively. However, the licensee stated that due to the past uncertainty regarding the acceptability of the desired 1992 Code Edition for ANO-1 and GGNS, Entergy will not be able to effectively complete the updates to the 1992 Edition of Section XI Code by the end of the current intervals.

The licensee has requested to extend the current intervals at these facilities until the updates can be completed. A commitment of no later than June 1, 1997, has been cited for completion of the update. The end of current interval inspections for both units were completed during refueling outages conducted in the fall of 1996. The next refueling outages are not scheduled until the spring of 1998; therefore, no examinations would be performed until then. Based on the schedule of refueling outages and the fact that the programs will be updated by the time the outages begin, the staff concludes that the current and next interval examinations would not be adversely affected by the requested extension of the current interval. The licensee has committed to completing all current interval examinations to the extent required by the Code, or obtaining appropriate relief in accordance with 10 CFR 50.55a. Therefore, the licensee's proposal provides an acceptable level of quality and safety.

The licensee has proposed to implement the rules found in Code Subsections IWE and IWL after completion of rulemaking. The new rule endorsing Subsections IWE and IWL of the ASME Code, Section XI is currently effective as of September 9, 1996, and the scope of the rule includes not only inspection, but repair and replacement as well. The licensee has committed to take appropriate action consistent with the rules of IWE and IWL as required by the provisions of 10 CFR Part 50.

The licensee has proposed to exclude Appendix VIII of the 1992 Edition of ASME Section XI in the updated ISI program. Appendix VIII provides requirements for performance demonstration for ultrasonic examination procedures, equipment, and personnel used to detect and size flaws. Instead, the licensee has proposed to follow the requirements of the 1989 Code Edition, Appendix I, *Ultrasonic Examinations*. One alternative for which we have not completed our review concerns the EOI proposal to exclude Appendix VIII on ultrasonic examinations of the 1992 Edition of ASME Section XI in the updated ISI program and to instead, follow the requirements in Appendix I of the 1989 Code Edition. We have not completed our review of the EOI proposal and this review will be the subject of a future letter and safety evaluation. EOI should

continue to use the current requirements for the four plants on ultrasonic examinations. We conclude that the EOI's remaining alternatives provide an acceptable level of quality and safety.

The licensee has requested to update the program plan at ANO-2 to these requirements at the end of the current interval, due to end in March 2000. Developing the ANO-2 ISI program to the same Code edition as all other licensee's programs will allow for consistent ISI implementation throughout the Entergy facilities. Consistency provides an additional level of quality and safety by allowing the personnel involved in implementing the programs to become familiar with the same group of Code requirements. Applying the same Code requirements to all of the facilities will allow the licensee to share experiences throughout the system. Therefore, the staff concludes that upgrading all of the licensee's ISI programs to these requirements provides an acceptable level of quality and safety.

The licensee also stated that it has not identified any requirement stating that the NRC review and approve the actual ISI program plans. However, it should be noted that the NRC is responsible for ensuring quality and safety of U.S. nuclear power plants. This responsibility requires that the NRC review the implementation of ASME Section XI, the application of Code Cases, and the requests for relief submitted by licensees in their respective inservice inspection program plans. To enable the staff to perform these tasks, the licensee is required to file their program plan(s) with the NRC per paragraph IWA-1400(c), ASME Section XI. Further, the 1992 Edition of Section XI, IWA-1310, *Components Subject To Inspection And Testing*, specifies that the selection of components for the inservice inspection plan is subject to review by the regulatory and enforcement authorities having jurisdiction at the plant site. In its July 12, 1996, letter, Entergy committed to submit the ISI program updates to the 1992 Edition, with portions of the 1993 Addenda, when they are completed.

3.0 CONCLUSION

Based on the information submitted, the staff adopts its contractor's conclusions and recommendations as presented in Attachment 1 to the Enclosure, the Technical Letter Report. The licensee's proposed alternatives are the following: 1) update to the 1992 Edition of ASME Section XI; 2) use the pressure testing requirements of the 1993 Addenda of ASME Section XI; 3) defer the 10-year program update until June 1, 1997, for ANO-1 and GGNS; and 4) update the program plan at ANO-2 to these requirements at the end of the current interval in March 2000. EOI also proposed to exclude Appendix VIII on ultrasonic examinations of the 1992 Edition of ASME Section XI in the updated ISI program and to, instead, follow the requirements in Appendix I of the 1989 Code Edition. One alternative for which we have not completed our review concerns the EOI proposal to exclude Appendix VIII on ultrasonic examinations of the 1992 Edition of ASME Section XI in the updated ISI program and to instead, follow the requirements in Appendix I of the 1989 Code Edition. We have not completed our review of the EOI proposal and this review will be the subject of a future letter and safety evaluation. EOI should continue to use

the current requirements for the four plants on ultrasonic examinations. We conclude that the EOI's remaining alternatives provide an acceptable level of quality and safety.

The staff concludes that the licensee's remaining alternatives provide an acceptable level of quality and safety.

Therefore, the licensee's proposed alternatives, other than the proposal to follow the requirements in Appendix I of the 1989 Code Edition, are authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Attachment: Technical Letter Report

Principal Contributors: Tom McLellan
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Dated: December 12, 1996

TECHNICAL LETTER REPORT
ON THE REQUEST FOR AUTHORIZATION TO UPDATE INSERVICE INSPECTION PROGRAMS
ENTERGY OPERATIONS INC.
ARKANSAS NUCLEAR ONE, UNITS 1 & 2, DOCKET NUMBERS: 50-313 & 50-368;
GRAND GULF NUCLEAR STATION, DOCKET NUMBER: 50-416;
RIVER BEND STATION, DOCKET NUMBER: 50-458; AND
WATERFORD 3 STEAM ELECTRIC STATION, DOCKET NUMBER: 50-382

1.0 INTRODUCTION

In a letter dated January 5, 1996, the licensee, Entergy Operations Inc., submitted a request for authorization to update the inservice inspection (ISI) program at each plant listed below to the 1992 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, including portions of the 1993 Addenda. During a conference call held on April 8, 1996, the Nuclear Regulatory Commission (NRC) requested additional information concerning the differences between the 1989 Edition of Section XI and those edition/addenda the licensee is requesting to use. This information was supplied by the licensee in a letter dated July 12, 1996. Based on the licensee's response, the NRC requested further information concerning the subject request in a letter dated October 9, 1996. The licensee provided the requested information in a letter dated November 1, 1996. The authorization is requested for use at the following plants:

<u>PLANT</u>	<u>UNIT</u>	<u>INTERVAL</u>	<u>START DATE</u>
Arkansas Nuclear One	1	3rd	Dec 1996
Arkansas Nuclear One	2	3rd	Mar 2000
Grand Gulf Nuclear Station	1	2nd	Jan 1997
River Bend Station		2nd	Dec 1997
Waterford 3		2nd	Jul 1997

The Idaho National Engineering Laboratory (INEL) staff has evaluated the subject request for authorization in the following section.

ATTACHMENT

2.0 EVALUATION

Information provided by the licensee in support of the request for authorization has been evaluated and the basis for disposition is documented below.

Request for Authorization to Implement the 1992 Edition Through the 93 Addenda of Section XI for Ten-Year Interval ISI Program Update(s)

Requirement: 10 CFR 50.55a(g)(4)(ii) states "Inservice examination of components and system pressure tests conducted during successive 120-month inspection intervals must comply with the requirements of the latest edition and addenda of the Code incorporated by reference in paragraph (b) of this section 12 months prior to the start of the 120-month inspection interval, subject to the limitations and modifications listed in paragraph (b) of this section."

10 CFR 50.55a(b) requires use of the 1989 Edition of Section XI with limitations and modifications listed in 10 CFR 50.55a(b)(2).

Licensee's Authorization Request: The licensee has requested approval to update their inservice inspection (ISI) program to the 1992 Edition including portions of the 1993 Addenda.

Licensee's Basis: The licensee's basis is contained in Entergy Operations Inc., letters from M. J. Meisner to U. S. Nuclear Regulatory Commission, dated July 12, 1996, and November 1, 1996. Accession NBRs 9607220157 and 9611060260 respectively. The July letter includes an assessment of each of a total of 184 changes between the 1989 Edition of the Code and the 1992 Edition, with portions of the 1993 Addenda. The letter gives the licensee's basis for why the sum total of the changes will provide an acceptable level of quality and safety in using the 1992 Edition, with portions of the 1993 Addenda, rather than updating to the requirements of the latest Code edition (1989 Edition) currently incorporated in paragraph (b) of 10 CFR 50.55a. The November letter

provided additional information regarding the exceptions that Entergy took regarding application of Appendix VIII for ultrasonic testing, examination of containments, applications of Code Cases approved by NRC in Regulatory Guide 1.147, and submittal of the ISI programs once they are developed.

Licensee's Proposed Alternative (as stated):

"Entergy proposes alternatives in accordance with 10 CFR 50.55a(a)(3) and requests schedule deferral on updating to the 1992 ASME Section XI Code for ANO-1 and GGNS until June 1, 1997.

"For ISI, Entergy proposes to adopt the 1992 Edition of the ASME Section XI Code including Appendix VII but excluding Appendix VIII. Entergy is aware that the provisions of Subsections IWE and IWL are to be required in a change to 10 CFR 50.55a in the near future. By our request to use the 1992 Edition of the ASME Code, Entergy does not propose an advance implementation of IWE and IWL prior to completion of rulemaking. For Appendix I, 'Ultrasonic Examinations,' we propose to implement the requirements of the 1989 Edition currently endorsed in 10 CFR 50.55a. In addition, we propose to adopt portions of the 1993 Addenda in lieu of the 1992 Edition for certain requirements:

- I. General Pressure Test Requirements (IWA-5000)
 - A. Table IWA-5210-1,
 - B. IWA-5250(a)(2), and
 - C. IWA-5265(b)
- II. Class 1 Pressure Test Requirements
 - A. Table IWB-2500-1, Examination Categories B-E and B-P, and
 - B. Article IWB-5000 in its entirety
- III. Class 2 Pressure Test Requirements
 - A. Table IWC-2500-1, Examination Category C-H, and
 - B. Article IWC-5000 in its entirety
- IV. Class 3 Pressure Test Requirements
 - A. Article IWD-5000 in its entirety

"The Arkansas Nuclear One Unit 2 (ANO-2) interval ends in March of 2000. ANO-2 intends to update at that time to a Code edition that will be consistent with all the other Entergy Plants. This will preclude an additional submittal when ANO-2 is required to update."

In response to the NRC's Request for Additional Information (RAI), the licensee submitted the following on November 1, 1996:

"In accordance with ASME requirements, the Regulatory Guide 1.147 Code Cases that are used by a licensee are listed in the ISI programs. Entergy intends to include these Code Cases in the ISI programs.

"Entergy will submit request for each Code Case proposed for use in the next interval and not endorsed in Regulatory Guide 1.147.

"The IWE and IWL final rule was published unexpectedly on August 8, 1996, after our July 12, 1996 letter was submitted, therefore, our letter was merely stating that we did not propose an advance implementation of IWE and IWL prior to completion of rulemaking. Because the IWE and IWL rulemaking has been completed, Entergy intends to take appropriate action consistent with the provisions of IWE and IWL or with the provisions of 10 CFR Part 50.

"Entergy is aware of the NRC's plan to require the implementation of Appendix VIII. In the future, when the rulemaking is completed, Entergy intends to take appropriate action consistent with the provisions of the final rule or with the provisions of 10 CFR Part 50."

Evaluation: The Code of Federal Regulations requires licensees to update their ISI programs to the 1989 Edition of Section XI. The licensee, Entergy Operations Inc., has proposed to

- 1) update to the 1992 Edition of ASME Section XI,
- 2) use the pressure testing requirements of the 1993 Addenda of ASME Section XI,
- 3) defer the 10-year program update until June 1, 1997 for ANO-1 and GGNS,
- 4) defer implementation of Code Subsection IWE, *Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Plants*, until required by CFR,
- 5) defer implementation of Code Subsection IWL, *Requirements for Class CC Concrete Components of Light-Water Cooled Plants*, until required by CFR,
- 6) defer implementation of Code Appendix VIII, *Performance Demonstration for Ultrasonic Examinations Systems*, and use the 1989 Edition of Appendix I, *Ultrasonic Examinations*, of ASME Section XI, until Appendix VIII is required by CFR, and
- 7) update the ANO-2 program plan to these requirements at the end of the current interval in March of 2000.

The INEL staff has reviewed the licensee's compilation of the differences among the subject editions of Section XI that the licensee considers to be increases or decreases in Code requirements. The majority of changes between the 1989 Edition and the 1992 Edition of Section XI are the incorporation of

Code Cases for which the NRC has been authorizing their use on a case-by-case basis. These differences, contained in Attachment 2 to the licensee's submittal dated July 12, 1996, should not adversely affect implementation of the ISI program. Therefore, the INEL staff believes that use of the 1992 Edition of Section XI will produce an acceptable level of quality and safety.

The licensee has requested to upgrade the pressure testing requirements of their ISI program plans to the 1993 Addenda of ASME Section XI. A review of the pressure testing portions of the 1993 Addenda of Section XI indicates that the Addenda incorporates Code Case N-498-1, *Alternative Rules for 10-year System Hydrostatic Testing for Class 1, 2, and 3 Systems*, into the Code. Code Case N-498-1 is frequently approved for use by the NRC, without condition. The INEL staff believes that use of the 1993 Addenda of Section XI for pressure test requirements will produce an acceptable level of quality and safety.

Entergy has requested to defer updating the 10-year ISI program plans for Arkansas Nuclear One, Unit 1 (ANO-1) and Grand Gulf Nuclear Station (GGNS) until June 1, 1997. The current intervals at ANO-1 and GGNS end in December 1996 and January 1997, respectively. However, the licensee stated that due to the past uncertainty regarding the acceptability of the desired 1992 Code Edition for ANO-1 and GGNS, Entergy will not be able to effectively complete the updates to the 1992 Edition of Section XI Code by the end of the current intervals. The licensee has requested to extend the current intervals at these facilities until the updates can be completed. A commitment of no later than June 1, 1997, has been cited for completion of the update. The end of current interval inspections for both units were completed during refueling outages conducted in the fall of 1996. The next refueling outages are not scheduled until the spring of 1998. The INEL staff believes, based on the schedule of refueling outages, that the current and next interval examinations would not be adversely affected by the requested extension of the current interval. The licensee has committed to completing all current interval

examinat' ... to the extent required by the Code, or obtaining appropriate relief in accordance with CFR. Therefore, an acceptable level of quality and safety will be maintained. Entergy has proposed to implement the rules found in Code Subsections IWE and IWL after completion of rulemaking. The new rule endorsing Subsection IWE and IWL of the ASME Code, Section XI is currently effective as of September 9, 1996, and the scope of the rule includes not only inspection, but repair and replacement as well. The licensee has committed to take appropriate action consistent with the rules of IWE and IWL as required by the provisions of 10 CFR Part 50.

Entergy proposed to exclude Appendix VIII of the 1992 Edition of ASME Section XI in the updated ISI program. Appendix VIII, which provides requirements for performance demonstration for ultrasonic examination procedures, equipment, and personnel used to detect and size flaws, is not required at this time. Instead, Entergy has proposed to follow the requirements of the 1989 Code Edition, Appendix I, *Ultrasonic Examinations*. The INEL staff has not completed its review of this proposal.

Entergy has requested to update the program plan at ANO-2 to these requirements at the end of the current interval, due to end in March 2000. Upgrading the Entergy ISI programs to the 1992 Edition with portions of the 1993 Addenda of Section XI is proactive, since use of the 1992 Edition is not required by the NRC. Developing the ANO-2 ISI program to the same Code edition as all other Entergy programs should allow for consistent ISI implementation throughout the Entergy facilities. Therefore, the INEL staff believes that upgrading all Entergy ISI programs to these requirements will provide an acceptable level of quality and safety.

The licensee stated that it has not identified a requirement for the NRC to review and approve the actual programs. However, the NRC is responsible for ensuring quality and safety of U.S. nuclear power plants. This responsibility requires the NRC to review the method of implementing ASME Section XI, the application of Code Cases, and the necessity for requests for relief submitted

by licensees in their respective inservice inspection program plans. To enable the staff to perform these tasks, the licensee is required to file their program plan(s) with the NRC. Additionally, the 1992 Edition of Section XI, IWA-1310, *Components Subject To Inspection And Testing*, states "The selection of components for the inservice inspection plan is subject to review by the regulatory and enforcement authorities having jurisdiction at the plant site."

3.0 CONCLUSION

The INEL staff has reviewed the licensee's request for authorization to update the inservice inspection (ISI) program to alternative requirements. The licensee's proposed alternatives are the following: 1) update to the 1992 Edition of ASME Section XI; 2) use the pressure testing requirements of the 1993 Addenda of ASME Section XI; 3) defer the 10-year program update until June 1, 1997, for ANO-1 and GGNS; and 4) update the program plan at ANO-2 to these requirements at the end of the current interval in March 2000. One alternative for which the INEL staff has not completed its review concerns the licensee's proposal to exclude Appendix VIII on ultrasonic examinations of the 1992 Edition of ASME Section XI in the updated ISI program and to, instead, follow the requirements in Appendix I of the 1989 Code Edition. The licensee should continue to use the current requirements for the four plants on ultrasonic examinations. The INEL staff concludes that the licensee's remaining alternatives provide an acceptable level of quality and safety.

Therefore, it is recommended that the licensee's alternatives, except for excluding Appendix VIII of the 1992 Edition of ASME Section XI, be authorized pursuant to 10 CFR 50.55a(a)(3)(i).