

February 26, 2013

MEMORANDUM TO: FILE

FROM: N. Kaly Kalyanam, Project Manager /RA by Alan Wang for/
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT NO. 2 - SUMMARY OF
TELEPHONE CONFERENCE RE: VERBAL AUTHORIZATION FOR
REVISED RELIEF REQUEST ANO2-ISI-007 (TAC NO. MF0331)

This memorandum summarizes the telephone discussion on December 18, 2012, between the U.S. Nuclear Regulatory Commission (NRC) staff and Entergy Operations, Inc. (Entergy, the licensee). The discussion was in regard to the licensee's revised request for relief ANO2-ISI-007 for Arkansas Nuclear One, Unit 2 (ANO2). Participants in the discussion included Stephenie Pyle, Bill Greeson, William Sims, Jamie Gobell, Ken Panther, Randall McGaha, and Robert Clark (Entergy), and Tim Lupold, Jay Wallace, Stephen Cumblidge, Michael Markley, and Kaly Kalyanam (NRC).

Piping and NDE Branch (EPNB) Chief

By letter dated December 4, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12340A449), as supplemented by letter dated December 17, 2012 (ADAMS Accession No. ML12354A203), Entergy submitted "Revised Request for Alternative ANO2-ISI-007^[1], Code Case N-770-1 Baseline Examination," for NRC review and authorization. The licensee's request for alternative had been submitted under paragraph 50.55a(a)(3)(ii) of Title 10 of the *Code of Federal Regulations* (10 CFR), compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Portions of the letter dated December 4, 2012, contain sensitive unclassified non-safeguards information (proprietary) and, accordingly, those portions have been withheld from public disclosure.

The licensee is proposing to credit the ultrasonic testing (UT) examinations of the reactor coolant pump (RCP) dissimilar metal butt welds (DMBW) performed at ANO2, in the fall of 2009 to fulfill the baseline examination requirement of 10 CFR 50.55a(g)(6)(ii)(F). The licensee states that the previous UT examinations were performed using American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Appendix VIII, requirements, but could not obtain essentially 100 percent coverage of the required examination

¹ The original Relief Request No. ANO2-ISI-007 was submitted by Entergy Operations, Inc. by letter dated November 30, 2011, as supplemented by letters dated April 13, May 21, and September 10, 2012 (ADAMS Accession Nos. ML113340158, ML12104A066, ML12142A319, and ML12255A686, respectively).

volume for axial flaws due to the weld taper and the presence of the cast austenitic stainless steel (CASS) safe-ends. By letter dated November 27, 2012, the NRC staff issued a safety evaluation concerning examination of the subject welds. In the safety evaluation, the NRC staff determined that fulfilling the essentially 100 percent examination requirements for axial flaws is not possible using currently available technology and procedures, and that weld 10-014 is bounding for the subject welds. In addition, the NRC staff also concluded that achieving the required examination coverage would require modification and/or replacement of the components which would constitute a hardship.

The licensee has submitted a UT scan coverage map for weld 10-014 which reflects the credited scan volume of the Performance Demonstration Initiative-approved UT procedure SI-UT-130 for tapered welds, PDQS No. 632, drawing 717/X. The coverage map shows the volume of the weld that cannot be credited and which could contain a hypothetical flaw. The licensee has proposed that the largest hypothetical flaw that could not be detected would have a depth of 10 percent of the wall thickness.

In the safety evaluation dated November 27, 2012, the NRC staff had concerns with the previous flaw evaluation and limited the use of the previous fall 2009 examination to January 1, 2013. In the revised proposed alternative, the licensee has submitted a flaw growth calculation for a hypothetical flaw growing by pressurized-water stress-corrosion cracking in response to operational stress and weld residual stresses resulting from a 50 percent repair. The NRC staff concludes that the assumed 50 percent weld repair will bound any likely undocumented weld repair and therefore, concludes the proposed alternative is acceptable. The licensee's calculation showed that a 16.7 percent through-wall flaw, significantly deeper than the proposed hypothetical 10 percent deep flaw, would require in excess of 54 months to grow to the ASME Code allowable flaw size of 75 percent through wall. The NRC staff has performed an independent flaw growth analysis and confirmed the licensee's calculation; therefore, it is acceptable.

Based on the above, the NRC staff concludes that performing the actions needed to achieve the UT examination coverage required by 10 CFR 50.55a(g)(6)(ii)(F) would constitute a hardship. The NRC staff also concludes that there is reasonable assurance of structural integrity and leak tightness of the subject welds for a period of at least 54 months from the time of the UT examination that was performed in the fall of 2009.

The NRC staff reviewed the licensee's proposed alternative under the requirements of 10 CFR 50.55a(a)(3)(ii), which states that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Based on its review, the NRC staff concludes that complying with the specified requirement to perform an examination which results in essentially 100 percent coverage of the required volume would result in a hardship or unusual difficulty without a compensating increase in quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements of 10 CFR 50.55a(a)(3)(ii). Therefore, the NRC staff authorizes alternative ANO2-ISI-007 at ANO2, accepting the fall of 2009 examination as the baseline examination required by 10 CFR 50.55a(g)(6)(ii)(F). The next examination would then be required during the spring 2014 refueling outage.

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Based on the above, the NRC staff concludes that the proposed alternative will provide reasonable assurance that the structural integrity and leakage integrity of the RCP dissimilar metal butt welds at ANO2, will be maintained for a period of at least 54 months from the time of the UT examination that was performed in the fall of 2009.

As set forth above, the NRC staff concludes that the proposed alternative provides reasonable assurance of structural integrity and leakage integrity of the RCP dissimilar metal butt welds. The NRC staff concludes that complying with the specified ASME Code requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii) and is in compliance with the requirements of the ASME Code, Section XI. Therefore, on December 18, 2012, the Chief, Piping and NDE Branch, Division of Engineering, and the Chief, Plant Licensing Branch IV, Division of Operating Reactor Licensing, verbally authorized the use of Relief Request ANO2-ISI-007 at ANO2, until the spring 2014 refueling outage.

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

The NRC's written final safety evaluation will follow as a matter of routine. The NRC staff may ask clarification questions as it prepares the written safety evaluation. The licensee had no additional comments or questions.

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As set forth above, the NRC staff concludes that the proposed alternative provides reasonable assurance of structural integrity and leakage integrity of the RCP dissimilar metal butt welds. The NRC staff concludes that complying with the specified ASME Code requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii) and is in compliance with the requirements of the ASME Code, Section XI. Therefore, on December 18, 2012, the Chief, Piping and NDE Branch, Division of Engineering, and the Chief, Plant Licensing Branch IV, Division of Operating Reactor Licensing, verbally authorized the use of Relief Request ANO2-ISI-007 at ANO2, until the spring 2014 refueling outage.

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