#### May 3, 2004

### LICENSEE: Entergy Operations, Inc. (Entergy or the licensee)

FACILITY: Arkansas Nuclear One, Unit 1 (ANO-1)

SUBJECT: SUMMARY OF APRIL 16, 2004, CATEGORY 1 MEETING WITH ENTERGY TO DISCUSS RELIEF REQUESTS R&R-005 AND -006 (TAC NO. MB9660)

On April 16, 2004, a public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of Entergy, at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, MD. The purpose of the meeting was to discuss Entergy's February 23, 2004, relief requests R&R-005 and -006, as supplemented. These relief requests may be needed to support the repair of the reactor pressure vessel (RPV) head penetration nozzles, during the Spring 2004 refueling outage. Entergy plans to replace the ANO-1 head during the Fall 2005 refueling outage.

Relief request R&R-005 pertains to an alternative welding process. Relief request R&R-006 pertains to an alternative to evaluating a flaw, which estimates the crack extent and orientation (including an alternative to the safety margin of 3.16), and an alternative to the examination of the repair weld (due to a potential lack of fusion at the root of the repair weld). During the meeting, the NRC staff indicated that it had reviewed the licensee's application on relief request R&R-005 and had no further questions pertaining to it. As a result, most of the discussion that took place in the meeting, and what follows in this meeting summary, pertains to relief request R&R-006.

The licensee's presentation included the following areas: overview, head fabrication, basis for selection of nozzle for analysis, flaw model and hoop stress distribution through the reactor vessel head, fracture mechanics results for various chamfer cases, technical basis for method of analysis, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) considerations, and a supporting elastic-plastic fracture mechanics analysis. Regarding ASME Code considerations, the licensee proposes to leave a remnant of the J-groove weld in place following repair activities and operate with a stress intensity factor employing an alternative safety factor of 2.0, instead of the ASME Code Section XI safety factor of 3.16. The licensee discussed how the alternative safety factor of 2.0 is consistent with the technical body of information associated with this type of repair and indicated that it is sufficiently conservative. Specifically, the licensee indicated that it is appropriate to apply rules for piping repair to this type of vessel head repair.

The NRC staff indicated that the licensee made a good presentation that appeared to be technically sound. The NRC staff indicated that it needs to further review the information presented, and it may provide the licensee with additional feedback at a later date. However, the NRC staff also indicated that it has a concern about not meeting the ASME Code-required safety factor when leaving potential flaws in place, and that there is not sufficient time to review the proposed alternative safety factor in time for the ANO-1 refueling outage.

Regarding the operational stresses in the RPV head, the licensee indicated that these stresses become compressive at an unknown distance into the head. The staff indicated that it may be helpful to know the location in the head, relative to the J-groove weld remnant, where the stresses become compressive and the resultant stress intensity factor at that point. The licensee indicated that it would consider performing an analysis to determine the point beyond the J-groove weld where the stresses become compressive; however, it would require a reanalysis of the fracture mechanics calculations, which could be very time-intensive and iterative.

A list of meeting attendees is enclosed. A copy of the licensee's handout provided at the meeting has been placed in the NRC Agencywide Documents Access and Management System (Accession Number ML041100665).

Please direct any inquiries to Tom Alexion at 301-415-1326 or twa@nrc.gov.

### /RA/

Thomas W. Alexion, Project Manager, Section 1 Project Directorate IV Division of Licensing Project Management Office of Nuclear Reactor Regulation

Docket No. 50-313

Enclosure: List of attendees

cc w/encl: See next page

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### /RA/

Thomas W. Alexion, Project Manager, Section 1 Project Directorate IV Division of Licensing Project Management Office of Nuclear Reactor Regulation

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Docket No. 50-313 Enclosure: List of attendees cc w/encl: See next page

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## MEETING ON ENTERGY'S RELIEF REQUESTS R&R-005 AND -006

# <u>ANO-1</u>

# APRIL 16, 2004

# ATTENDEES

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### **ORGIANIZATION**

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B. James
W. Sims
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R. Gramm
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