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2CAN031301

March 1, 2013

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: Request for Relief from American Society of Mechanical Engineers (ASME)
Code, Section XI - Request for Relief ANO2-ISI-015
Arkansas Nuclear One, Unit 2
Docket No. 50-368
License No. NPF-6

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(a)(3)(ii), Entergy Operations, Inc. (Entergy) requests relief from the requirements of the ASME, Boiler and Pressure Vessel Code (Code), Section XI pertaining to the period pressure testing requirements for the Arkansas Nuclear One, Unit 2 (ANO-2) reactor vessel flange seal leak detection piping. Entergy has determined that the required pressure test requirements are impractical due to the configuration and design of the system, and compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The proposed alternative is based on ASME Code Case N-805, "Alternative to Class 1 Extended Boundary End of Interval or Class 2 System Leakage Testing of Reactor Vessel Flange O-ring Leak Detection System". This code case was issued to the 2010 Edition of the ASME Section XI Code and is listed in Supplement 6 for Code Cases. However, Code Case N-805 has not been approved by the NRC and is not identified in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1". Similar relief requests have been approved. These include Comanche Peak Nuclear Power Plant (NL113110092), LaSalle County Station (ML073610587), and Susquehanna Steam Electric Station (ML042680078).

The need for this relief request was identified during the NRC Inservice Inspection (ISI) inspection of ANO-2 during the fall refueling outage (2R22) in September 2012. The reactor vessel flange seal leak detection piping was examined, using the proposed alternative method, during 2R22. ANO-2 was in Mode 6, the reactor vessel head was removed, and the reactor cavity was filled to its normal refueling water level. The associated ASME Class 2 piping system was subject to the static pressure head when the reactor cavity was filled. After a four-hour hold time, a visual (VT-2) examination of the accessible areas of the piping system was performed and no evidence of leakage was identified.

The next ANO-2 refueling outage (2R23) during which the alternative examination method could be performed will occur in Spring 2014 (fourth ISI 10-year interval, second period). Entergy plans to credit the 2R22 examination of the reactor flange seal leak detection system to the fourth ISI 10-year interval, first period, which began March 26, 2010, and will end March 25, 2013, should it comply with the relief request as approved by the NRC.

This submittal contains no regulatory commitments.

If you have any questions or require additional information, please contact me.

Sincerely,

Original signed by Stephenie L. Pyle

SLP/rwc

Attachment: Relief Request ANO2-ISI-015

cc: Mr. Elmo E. Collins
Regional Administrator
U. S. Nuclear Regulatory Commission, Region IV
1600 East Lamar Boulevard
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NRC Senior Resident Inspector
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U. S. Nuclear Regulatory Commission
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Attachment to

2CAN031301

Relief Request - ANO2-ISI-015

RELIEF REQUEST

ANO2-ISI-015

Component / Number:	Nominal Pipe Size 3/4" Reactor Pressure Vessel (RPV) Flange Seal Leak-Off Piping Line Number 2CCB-69-3/4" – Inspection Program B
Code Class:	American Society of Mechanical Engineers (ASME) Code Class 2
References:	ASME Section XI 2001 Edition w/ 2003 Addenda, Table IWC-2500-1 and IWC-5220 Code Case N-805 Plant Boundary Drawing P-2230, Sheet 1
Examination Category:	C-H
Item Number(s)	C7.10
Description:	Alternative Pressure Testing Requirements for the RPV Flange Leak-Off Piping
Unit / Inspection Interval Applicability:	Arkansas Nuclear One, Unit 2 (ANO-2) / Fourth 10-Year Interval

I. CODE REQUIREMENTS

ASME Section XI, Table IWC-2500-1, Examination Category C-H, "Pressure Retaining Components – Inspection Program B":

Item C7.10 requires a System Leakage Test (Visual-VT2) each inspection period of all Class 2 pressure retaining components.

Per IWC-5222(a), the pressure retaining boundary includes the portion of the system required to operate or support the safety function up to and including the first normally closed valve.

II. RELIEF REQUEST

Pursuant to 10 CFR 50.55a(a)(3)(ii), Entergy Operations, Inc. (Entergy) requests relief from performing the code required examination. Compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

III. BASIS FOR RELIEF

The ASME Code Section XI, 2001 Edition through 2003 Addenda requires that Class 2 pressure boundary piping shall be pressure tested once each inspection period. The reactor vessel flange seal leak detection piping is separated from the reactor coolant pressure boundary by one passive metallic seal, which is the first of two O-rings. The pressure tap for the leak detection piping is located on the vessel flange mating surface. A second O-ring is located on the outside of the pressure tap in the vessel flange. Failure of the inner O-ring is the only condition under which this line is pressurized. Therefore, the line is not expected to be pressurized during the system pressure test following a refueling outage. Additionally, isolation valves 2RC-1A/B and 2RC-2 are normally open during plant operations which would prevent significant pressure build-up in the piping in the event of an inner O-ring leak.

The configuration of this piping precludes system pressure testing while the vessel head is removed because the pressure tap would have to be plugged. This would require a design modification to install a plug into the pressure tap on the vessel flange. A threaded or pressure test type plug would need to be installed in the flange face to act as a pressure boundary for each test, and then removed after the test. The installation of the mechanical modification and subsequent use would incur significant dose, which would be inconsistent with keeping dose as low as reasonably achievable. Either method of plugging would also present a foreign material exclusion issue for the handling of a very small diameter plug that would be required to be installed to complete a leakage test at pressure.

The configuration also precludes pressurizing the line externally with the head installed. The closure head contains two concentric grooves that hold the inner and outer O-rings. The O-rings are held in place by a series of retainer clips that are housed in recessed cavities in the flange face. If a pressure test were to be performed with the head installed, the inner O-ring would be pressurized in a direction opposite to its design function. This test pressure would result in a net inward force on the inner O-ring that would tend to push it into the recessed cavity that houses the retainer clips. The thin O-ring material could be damaged by the inward force.

Purposely failing or not installing the inner O-ring in order to perform a pressure test would require a new O-ring set to be installed. The time and radiation exposure associated with removing and reinstalling the closure head, replacing the outer O-ring and re-cleaning of the vessel flange mating surface prior to head installation would be an undue hardship. In addition, this special test would require a reactor coolant system heat-up / cool down cycle. Therefore, compliance with the IWC- 5222(b) system pressure test requirements will result in an unnecessary hardship without a sufficient compensating increase in the level of quality and safety.

IV. PROPOSED ALTERNATIVE EXAMINATIONS

In lieu of the requirements of IWC-5222(b), a VT-2 visual examination of the accessible areas of the leak detection system piping will be performed while the system is subjected to the static pressure from the head of water when the reactor cavity is filled to its normal refueling water level for at least four hours. This test will be part of the reactor coolant

Class 2 leakage test. The test will be performed within the frequency specified by table IWC-2500-1 for a System Leakage Test (once each inspection period).

If the inner O-ring should leak during the operating cycle it will be identified by an increase in temperature of the leak-off line above ambient temperature. This leak detection piping has a temperature indicator in the Control Room and is monitored per ANO-2 Technical Specifications 3/4.4.6 "Reactor Coolant System Leakage". This high temperature would actuate an alarm in the Control Room, which is closely monitored by procedurally controlled operator actions allowing identification of any further compensatory actions required. This piping also acts as a leak-off line to collect leakage which would be routed to the Reactor Coolant Drain Tank.

Additionally, the reactor vessel flange seal leak detection piping would only function as a Class 2 pressure boundary if the inner O-ring fails; thereby, pressurizing the line. If any significant leakage does occur in the leak detection piping during this time of pressurization, it would exhibit boric acid accumulation that would be discernible during the VT-2 visual examination to be performed as proposed in this request.

V. CONCLUSION

10 CFR 50.55a(g)(6)(i) states:

The Commission will evaluate determinations under paragraph (g)(5) of this section that Code requirements are impractical. The Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or 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 on the facility.

Entergy believes that it is impractical to perform the period system leakage test as it is currently defined in Table IWC-2500-1 and IWC-5222. To effectively obtain significant results would necessitate modification and/or replacement of the component. The proposed examinations performed per Code Case N-805 on the subject piping system would detect degradation, if it existed, demonstrating an acceptable level of integrity. Entergy requests the proposed relief be authorized pursuant to 10 CFR 50.55a(g)(6)(i).