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2CAN030903

March 20, 2009

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

SUBJECT: Request for Alternative From the Requirements of
ASME OM Code-2004 Edition – PRR-ANO2-2009-1
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)(i), Entergy Operations, Inc. (Entergy) hereby requests an alternative for the Arkansas Nuclear One, Unit 2 (ANO-2) Inservice Testing (IST) program. The proposed alternative is requested when using the requirements of ASME OM Code – 2004 Edition, pertaining to parameters monitored during quarterly testing of the Low Pressure Safety Injection (LPSI) pumps.

The proposed alternative is to categorize the LPSI pumps as Group B during Modes 1-4, and as Group A during Modes 5-6, which allows for a reduction of monitored parameters during quarterly on-line testing. A similar request was made by Calvert Cliff and approved by the NRC in a Safety Evaluation dated June 18, 2008. The details of the request are attached.

This request is in support of the 120 month update to the ANO-2 IST program for the fourth interval which begins on March 26, 2010.

In accordance with 10 CFR 50.55a(a)(3)(i), the proposed alternative to the referenced requirements may be approved by the NRC provided an acceptable level of quality and safety are maintained. Entergy believes the proposed alternative meet this requirement.

The request does not include any new commitments.

Although this request is neither exigent nor emergency, your prompt review is requested.

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

Sincerely,

DBB/rwc

Attachment: Request for Alternative PRR-ANO2-2009-1

cc: Mr. Elmo E. Collins
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U. S. Nuclear Regulatory Commission
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ATTACHMENT to

2CAN030903

Request for Alternative

PRR-ANO2-2009-1

10 CFR 50.55a Request Number PRR-ANO2-2009-1	
Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(i) 10 CFR 50.55a Request Title: 2P-60A, 2P-60B Alternative Request	
PLANT / UNIT:	Arkansas Nuclear One Unit 2
INTERVAL:	Fourth 120 Month Inservice Testing Interval
COMPONENTS AFFECTED:	Pumps: 2P-60A, 2P-60B System: Low Pressure Safety Injection (LPSI) These vertical line shaft pumps supply borated water to the Reactor Coolant System (RCS) in the event of an accident. These pumps start upon the receipt of a safety injection actuation signal. Additionally, these pumps provide shutdown cooling to the RCS during cold shutdowns.
CODE EDITION AND ADDENDA:	ASME OM Code-2004 Edition
REQUIREMENTS:	ISTB-2000 Defines Group A pumps as "pumps that are operated continuously or routinely during normal operation, cold shutdown, or refueling operations," and Group B pumps as “pumps in standby systems that are not operated routinely except for testing.” ISTB-1400 (b) States that “A pump that meets both Group A and Group B pump definitions shall be categorized as a Group A pump.” Pumps shall be tested in accordance with paragraphs ISTB-5221, ISTB-5222 or ISTB-5223 to the acceptance limits provided in Table ISTB-5221-1, which provides acceptance criteria for vertical line shaft pumps.
REASON FOR RELIEF REQUEST:	Pursuant to 10 CFR 50.55a, “Codes and Standards”, paragraph (a)(3)(i), an alternative is requested from the requirements of ASME OM Code-2004 Edition based upon the proposed alternative providing an acceptable level of quality and safety. The ANO-2 LPSI pumps are tested quarterly utilizing a minimum flow recirculation path. During power operation, this recirculation flow path is the only flow path available for testing LPSI pumps which does not violate train separation requirements. On recirculation, flow is from the refueling water tank (RWT), through an orificed line, back to the RWT. The flow resistance of the loop is therefore, fixed and

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	consistent for each inservice test. Although there is no installed instrumentation to measure flow during inservice testing, flow during inservice testing has been determined to be approximately 100 gpm. Additionally, the LPSI pumps are tested near design flow rate during each refueling outage, as well as during cold shutdowns when plant conditions and circumstances permit. These tests were called "Full Flow Tests – Shutdown" during the 3rd interval, and will be performed during the 4th interval in accordance with the requirements of ISTB for comprehensive pump tests. Quarterly LPSI pump tests are performed utilizing the minimum recirculation flow path with resulting low flow conditions. With pump curves being relatively flat at this low flow, the pump differential pressure is not as sensitive to gradual pump degradation as with the full flow comprehensive tests, but would be reflective of significant step changes in pump performance or suction/discharge flow blockage. Therefore, the comprehensive pump tests ensure monitoring of operational time-based pump degradation, whereas the quarterly Group B pump tests provide reasonable assurance of operational readiness of the LPSI pumps. <u>Vibration Measurements</u> ANO-2's 3rd Interval quarterly pump tests required pump vibration measurements. With the lower recirculation path flow rates during these quarterly tests, the pumps are not near their pump best efficiency points and result in recirculation flow noise. This recirculation flow noise causes a raised vibration spectral noise floor and overall vibration values that are 2 to 3 times above the values observed during the 18 month full flow testing (cold shutdowns and refueling outages). These vibration readings have been subject to spectral analysis under the ANO Predictive Maintenance Vibration Analysis program, which is separate from the ANO Inservice Test (IST) program. The spectral analyses have consistently confirmed that the major contributor to the high overall vibration reading is recirculation flow noise. The effects of low flow operation make the broadband IST vibration readings during quarterly test of minimal value. Under the 2004 Code, the operational readiness of Group B pumps is reasonably assured without quarterly vibration measurements.

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	The ANO-2 LPSI pumps (and motors) are located in areas which are both radiation areas and contamination areas. Dose rates for these locations vary depending upon the current location of radiological hot spots. This results in ALARA issues as well as contamination control issues to obtain quarterly vibration data. In addition to radiological concerns, the areas are also difficult to access and require the use of a ladder to access the top of the LPSI pump motors to monitor upper motor vibration, as required on a quarterly basis for Group A vertical line shaft pumps. <u>Flow Measurements</u> The ISTB Code requires both flow and differential pressure measurements on a quarterly basis for Group A pumps. The ANO-2 LPSI pumps were not designed with flow indication on the minimum recirculation flow path. An instrumented flow path is available during cold shutdown and refueling for comprehensive or Group A pump testing. Flow measurement using portable flow measurement equipment would not be practical on a quarterly basis to achieve the required accuracy for Group A testing. A modification of the plant to provide flow instrumentation for Group A testing of pumps in standby during normal operation would be an expensive and unnecessary burden compared with the minimal benefit of additional pump performance data. Monitoring pump differential pressure on a quarterly basis without indicated flow meets the monitoring requirements of ISTB for Group B pump tests. On this basis, an acceptable level of quality and nuclear safety is still maintained while many of the burdens, costs and concerns associated with quarterly vibration and flow measurements, including both ALARA and personnel safety issues, would be eliminated by categorizing the ANO-2 LPSI pumps as Group B during Modes 1-4, and as Group A during Modes 5-6. With the LPSI pumps categorized as Group B during Modes 1-4, the two minute minimum pump run time for quarterly tests is also eliminated. Elimination of the minimum pump run time requirement and the requirement to record vibration levels will reduce the pump run time required for each quarterly test. This will help reduce the cumulative run time for each LPSI pump under low flow conditions to support testing, with a commensurate reduction in pump wear.

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PROPOSED ALTERNATIVE AND BASIS:	Perform inservice testing of the LPSI Pumps per the 2004 Edition of the OM Code Subsection ISTB, "Inservice Testing of Pumps in Light-Water Reactor Power Plants," with the following modifications: LPSI Pump Group Classification - The LPSI pumps will be tested as stand-by pumps (Group B) during Modes 1-4 and continuously or routinely operated pumps (Group A) during Modes 5-6. Based upon the determination that the proposed alternative to the ASME OM Code-2004 Edition requirements would provide an acceptable level of quality and safety, it is requested that the alternative be granted pursuant to 10 CFR 50.55a(a)(3)(i). Bases for proposed modification of the 2004 OM Code "LPSI Pump Group Classification" Subsection ISTB Paragraph ISTB-2000 of the 2004 OM Code defines Group A pumps as "pumps that are operated continuously or routinely during normal operation, cold shutdown, or refueling operations," and Group B pumps as, "pumps in standby systems that are not operated routinely except for testing". Based on these definitions, as supported by ANO-2 Operating Procedures, the LPSI pumps meet the definition of Group A and Group B pumps. The LPSI pumps clearly meet the definition of Group B pumps during normal operation in Modes 1-4. In Modes 5-6, the LPSI pumps are used for shutdown cooling and meet the definition of Group A pumps. Subsection ISTB Paragraph ISTB-1400(b) states "A pump that meets both Group A and Group B pump definitions shall be categorized as a Group A pump." This means that the LPSI pumps would be classified as Group A and would be subjected to essentially the same quarterly test requirements that applied under OM-1987, OMa-1988 Part 6. NUREG/CP-01 37 Vol. 1, Proceedings of the Third NRC/American Society of Mechanical Engineers (ASME) Symposium on Valve and Pump Testing, includes a paper titled, "Description of Comprehensive Pump Test Change to ASME Code, Subsection ISTB." This paper describes the philosophy of classifying pumps into Groups (Group A vs. Group B). According to this paper, the intent of having different test requirements for the different pump Groups is to relate the amount and degree of quarterly performance monitoring required to the amount of degradation expected due to pump operation. Requiring the LPSI pumps to be tested quarterly as Group A pumps during normal operation in Modes 1-4 is contrary to the philosophy of

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	the referenced paper. Quarterly testing subjects the LPSI pumps to increased test requirements, performance monitoring, and potentially more pump degradation due to pump low-flow operation at the time when they are actually standby pumps and would not otherwise be subject to operational-induced degradation. ANO-2 considers the requirement to test the LPSI pumps as Group A pumps during normal operation (Modes 1-4) to be potentially detrimental on a long-term basis. Therefore, the LPSI pumps will be considered as, and tested as, Group B pumps during normal operation in Modes 1-4. As previously stated the LPSI pumps are typically run during cold shutdown and refueling operations, for decay heat removal. As a result, they are subject to operationally induced degradation in Modes 5-6. Therefore, Group A or Comprehensive testing requirements will apply to the LPSI pumps during quarterly testing performed during cold shutdown or refueling. Current test results indicate that the LPSI pumps (2P-60A and 2P-60B) have not experienced any abnormal degradation, and both are currently performing satisfactorily. The pumps have had no unexplained non-conformances for hydraulic performance or vibration. Current operational performance of each of the LPSI pumps remains within Code allowable as-found pump performance parameters for all recorded parameters, for both the IST program and for the Vibration Monitoring program.
PRECEDENTS:	Relief was previously granted for Calvert Cliffs Nuclear Station by the Commission in a letter to the utility dated June 18, 2008. The Calvert Cliff's relief addressed categorization of pumps as Group A pumps during shutdown and refueling and as Group B pumps during normal operation, in addition to addressing expanded pump vibration acceptance limits during low flow testing. The ANO-2 relief request addresses only the subject of pump categorization.