



Entergy

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2CAN090303

September 30, 2003

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

Subject: Request for Additional Information Regarding the May 1, 2003, Containment  
Spray System License Amendment Request  
Arkansas Nuclear One - Unit 2  
Docket No. 50-368  
License No. NPF-6

Dear Sir or Madam:

Entergy Operations, Inc. (Entergy) submitted a *License Amendment Request to Change the Containment Spray System Surveillances* for Arkansas Nuclear One, Unit 2 (ANO-2) by letter dated May 1, 2003 (2CAN050304). On Friday, May 30, 2003, the NRC Staff sent a Request for Additional Information (RAI) via electronic mail. Following discussions with ANO-2's NRR Project Manager, the staff revised the RAI and re-sent it on July 23, 2003. Entergy's proposed response was discussed with the Staff during a teleconference on August 21, 2003. During the teleconference, the staff asked a second question regarding the license amendment request. On Wednesday, September 3, 2003, the NRC sent the second RAI via electronic mail. Entergy's written response to both questions is contained in the attachment. Should you have questions or comments, please contact Mr. Dennis Boyd at (479) 858-4616.

There are no new commitments contained in this submittal.

Sincerely,

Sherrie R. Cotton  
Director, Nuclear Safety Assurance

SRC/dwb  
Attachment

A001

cc: Mr. Bruce S. Mallett  
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**Response to NRC Questions Regarding the  
May 1, 2003, Containment Spray System License Amendment Request  
for Arkansas Nuclear One, Unit 2 (ANO-2)**

**NRC Question 1**

*On May 1, 2003, the licensee submitted a request for a license amendment to Surveillance Requirement (SR) 4.6.2.1. The proposed changes would delete the requirement to verify the position of valves that are locked, sealed, or otherwise secured in their correct position, and replace the quantitative allowable pump degradation value with a requirement to verify the pumps perform in accordance with the Inservice Testing Program.*

*In Section 4.0, Technical Analysis, the licensee says that SR 4.6.2.1.a.1 would be modified to exclude the requirement to verify the position of locked, sealed or secured valves in their correct position.*

*Provide or justify the removal of verifying system alignment such that should the need for the recirculation cooling mode arise, that the alignment of valves can be made to provide recirculation without unlocking, unsealing, or unsecuring valves that would be excluded in the modified SR.*

**ANO Response**

No emergency core cooling system valves require manipulation by operators during either the injection or recirculation phase following an accident. Such manipulations are performed automatically for Combustion Engineering-designed plants. Automatic valve alignment is accomplished via an engineered safety features signal (recirculation actuation signal) sent to key motor operated valves to actuate the following sequence: open the containment sump isolation valves and close the refueling water tank outlet valves and containment spray pump mini-recirculation valves. In regard to boron precipitation, the operator has three or more hours to respond, and even then, there are no locked closed valves involved. The only operator action outside the control room is for the auxiliary operator to be dispatched to restore power to the hot leg injection motor operated valve breakers. Additionally, boron precipitation is mitigated via the Emergency Core Cooling System (ECCS) which is independent of the Containment Spray System.

The proposed wording of the change regarding verification of valves in the flow path of the containment spray system is identical to that approved by the NRC in Technical Specification Task Force (TSTF) 45 and, subsequently, NUREG-1432, Revision 2, *Standard Technical Specifications Combustion Engineering Plants*. Additionally, the proposed change is consistent with changes already incorporated in other ANO-2 technical specifications, e.g., ECCS (SR 4.5.2.b), Emergency Feedwater (SR 4.7.1.2), and Service Water (SR 4.7.3.1.a). These specifications currently contain the proposed wording and do not require short-interval verification of valves that are locked, sealed or otherwise secured in position. The surveillance requirement is intended to ensure verification of valve positions in the main flow path that could be inadvertently repositioned. It is unlikely that inadvertent repositioning could occur with regard to valves that are locked, sealed, or otherwise secured.

## **NRC Question 2**

*The licensee has proposed to change Technical Specification surveillance requirement 4.6.2.1.b for the containment spray pump degradation limit from, "verifying that each pump demonstrates degradation of  $\leq 6.3\%$  from its original acceptance test pump performance curve when tested pursuant to the Inservice Testing Program," to "verify each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head when tested pursuant to the Inservice Testing Program," which would allow up to 10% degradation. In the application, the licensee indicates that a reanalysis shows that the "A" containment spray pump could degrade by 11.7% and the "B" containment spray pump could degrade by 9.8%. Please indicate the design basis requirements which the pump has to meet and how a 9.8% degradation limit will be maintained under the IST program.*

## **ANO Response**

The proposed change to the ANO-2 Technical Specifications, consistent with the approved Standard Technical Specifications of NUREG-1432, Revision 2, does not remove the responsibility of the licensee to ensure that component performance criteria remain acceptable with regard to the most restrictive limits of either the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, the technical specifications, plant-specific safety analyses or other regulations. In the case of the "B" containment spray pump, the safety analysis is the most limiting performance standard.

Design basis requirements for containment spray pump performance are based on the assumptions made in the safety analysis. The assumptions made in the safety analysis are for the flow in the spray header before and after recirculation and the backpressure on the header (i.e., containment building pressure). These assumptions are reflected in the "ANO-2 Cycle 15/16 Safety Analysis Groundrules" document. The assumed spray flow and containment pressure are used in the pump performance evaluation to determine the pump head and flow which would be required in order to meet the safety analysis assumptions for header flow against the containment building backpressure. Pump recirculation is modeled in the evaluation until the system is aligned to the containment building sump.

The pump head and total flow predicted by this evaluation then becomes the safety analysis performance requirement. The current technical specification requirement of no more than 6.3% degradation is more limiting than the requirement determined by this method. Under the proposed technical specification, however, the head/flow requirement determined to satisfy the safety analysis requirement would be used as the surveillance test acceptance criteria for the "B" containment spray pump. The 10% ASME Code limit would still be limiting for the "A" containment spray pump.

Should the pump be replaced in the future, the surveillance test acceptance criteria would be unaffected from the safety analysis standpoint. Only a modification to the system which affects the head loss, a change to the safety analysis assumptions or a change to the instrument uncertainty would alter the performance required to meet the safety analysis. Rebuilding or replacement of the pump could result in a higher pump reference performance; therefore, the ASME Code requirement could become more limiting than the safety analysis. In this case, the ANO Inservice Testing (IST) Program would limit degradation to 10% consistent with the ASME Code with regard to allowable pump degradation limits.

Test acceptance criteria for pumps included in the ANO IST Program are developed in accordance with implementing procedure OP-5120.260, *IST Program Implementation*. These acceptance criteria constitute operability requirements for pumps included in the IST Program. NUREG-1482, *Guidelines for Inservice Testing at Nuclear Power Plants*, Section 5.6, requires that operability limits of pumps must always meet, or be consistent with, licensing basis assumptions in a plant's safety analysis. The IST Program recognizes the potential for more restrictive pump performance criteria than the 10% allowance given by the ASME OM Code, Part 6 (OM-6). These more restrictive criteria may be found in the Safety Analysis Report (SAR), Technical Specifications, or in the results or conclusions of calculations supporting the safety analysis. The use of these sources in the development of the IST Program is described in our IST program submittal dated November 12, 1999, *Third Interval Inservice Testing Program Submittal* (2CAN119904).

The current containment spray pump test acceptance criteria are based on the 6.3% degradation limit contained in ANO-2 Technical Specification 4.6.2.1.b. The proposed change eliminates the technical specification limit and allows acceptance criteria to be developed in accordance with the IST Program. ANO calculation results limit acceptable degradation for "B" containment spray pump to 9.8% to support the safety analysis. The ASME OM-6 Code allows 10% degradation. However, Procedure OP-5120.260 requires use of the more restrictive test acceptance criterion of 9.8%.