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2CAN050304

CORRECTED COPY
(to correct letter number)

May 1, 2003

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

SUBJECT: Arkansas Nuclear One, Unit 2 (ANO-2)
Docket No. 50-368
License Amendment Request to Change the Containment Spray System Surveillances

Dear Sir or Madam:

Pursuant to 10CFR50.90, Entergy Operations, Inc. (Entergy) hereby requests the following technical specification amendment for Arkansas Nuclear One, Unit 2 (ANO-2). The proposed change modifies the surveillance testing requirements for the containment spray system as specified in Technical Specification Surveillance Requirement 4.6.2.1. The revision will 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. The proposed change is consistent with NUREG-1432, Revision 2, "Standard Technical Specifications Combustion Engineering Plants."

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1) using criteria in 10CFR50.92(c) and it has been determined that this change involves no significant hazards consideration. The bases for these determinations are included in the attached submittal. The proposed change does not include any new commitments.

This request is neither exigent nor emergency. Approval is requested by February 1, 2004. Once approved, the amendment shall be implemented within 60 days. If you have any questions or require additional information, please contact Dennis Boyd at (479) 858-4616.

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 1, 2003.

Sincerely,

CGA/dwb

A001

Attachments:

1. Analysis of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (mark-up)
3. Proposed Technical Specification Changes (clean pages)

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Attachment 1

2CAN050304

Analysis of Proposed Technical Specification Change

1.0 DESCRIPTION

This letter is a request to amend Operating License NPF-6 for Arkansas Nuclear One, Unit 2 (ANO-2). The proposed change modifies the surveillance testing requirements for the containment spray system as specified in Technical Specification (TS) Surveillance Requirement (SR) 4.6.2.1.

The modification to SR 4.6.2.1.a.1 will delete the requirement to verify the position of valves that are locked, sealed, or otherwise secured in their correct position. SR 4.6.2.1.b will be modified to replace the quantitative allowable pump degradation value with a requirement to verify the pumps perform in accordance with the Inservice Testing Program.

The proposed change is consistent with NUREG-1432, Revision 2 "Standard Technical Specifications Combustion Engineering Plants" (Reference 1). No changes to the TS Bases are proposed.

2.0 PROPOSED CHANGE

The proposed change modifies TS SR 4.6.2.1.a.1 regarding verification of valve position and 4.6.2.1.b regarding allowable pump degradation. These SRs have not been changed or amended since the original issuance of the ANO-2 TSs. The existing wording for both proposed changes is provided below and contrasted with the proposed wording:

2.1 Existing wording for SR 4.6.2.1.a.1:

Verifying that each valve (manual, power operated or automatic) in the flow path is positioned to take suction from the RWT on a Containment Pressure-High-High test signal.

Proposed wording for SR 4.6.2.1.a.1 (adopted from NUREG-1432 SR 3.6.6A.1):

Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.

The frequency for SR 4.6.2.1.a.1 will remain once per 31 days.

2.2 Existing wording for SR 4.6.2.1.b:

By 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.

Proposed wording for SR 4.6.2.1.b (adopted from NUREG-1432 SR 3.6.6A.5):

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.

The justification for these changes is provided in the following sections of this attachment. Font size and page formatting have also been updated to be consistent with that used by a large part of the nuclear industry. Since these changes are administrative and do not change any technical information on the affected TS pages, no further background or justification discussions are included.

3.0 BACKGROUND

The containment spray system (CSS) and the containment cooling system comprise the containment heat removal system. The functional performance objective of the containment heat removal system is to rapidly reduce the post-accident containment pressure and temperature after a postulated loss-of-coolant accident (LOCA) or main steam line break (MSLB) accident by removing thermal energy from the containment atmosphere. The two diverse systems are both designed with redundant components so that a single failure of a component of either system will not prevent the function from being fulfilled. The containment heat removal system may be operated from either on-site or off-site power supplies.

The CSS also assists in limiting off-site radiation levels by removing fission product iodine from the containment atmosphere and reducing the pressure differential between the containment atmosphere and the outside atmosphere, thereby reducing the driving force for leakage of fission products from the containment. These radiological evaluations are discussed in the ANO-2 Safety Analysis Report (SAR) Chapters 11 and 15 (Reference 2). The containment heat removal system meets the requirements of General Design Criteria (GDC) 38, 39 and 40 as described in the SAR (Reference 2).

The containment heat removal system is designed so that either of the following combinations of equipment will provide adequate heat removal to attenuate the post-accident pressure and temperature conditions imposed upon the containment following a LOCA or MSLB:

A. both trains of the CSS; or,

B. one train of CSS and one train of containment cooling system.

The CSS is designed to remove energy from the atmosphere by injecting water into the atmosphere. The energy removed from the atmosphere is a function of the heatup of the spray droplets. The CSS provides for fission product iodine removal from the containment atmosphere by a combination of boric acid spray and a buffered pH solution using trisodium phosphate dodecahydrate. Therefore, at least one CSS train must operate following a LOCA. The recirculation of this solution through the CSS reduces the iodine concentration in the containment atmosphere and suppresses the increase in containment pressure and temperature. This solution will retain the fission products in the containment sump water thereby considerably reducing the potential of fission product leakage to the environment. During the recirculation mode, the reactor coolant is cooled by the shutdown cooling heat exchangers located at the discharge of each CSS pump.

The CSS normally operates only during accident conditions, but may be used as a backup to the normal shutdown cooling system pumps (low pressure safety injection pumps) during low or atmospheric reactor coolant system pressure conditions.

The containment spray pump performance requirements were recalculated as part of the containment uprate effort associated with replacement of the steam generators. As a result of increasing the containment building design pressure from 54 to 59 psig, the pump performance requirements were recalculated at the new pressure. Subsequently, the current allowable containment spray pump degradation may be increased above 6.3% without compromising the required containment spray flow that must be delivered to the containment building to satisfy the safety analysis.

4.0 TECHNICAL ANALYSIS

Surveillance Requirement 4.6.2.1.a.1 (verification of valve position)

Surveillance requirement 4.6.2.1.a.1 will be modified, consistent with NUREG-1432, Revision 2, to exclude the requirement to verify the position of those valves that are locked, sealed, or otherwise secured in their correct position. It is a widely accepted standard practice throughout the industry and the NRC to not require position verification of valves that are locked, sealed, or otherwise secured on such a short frequency (31 days) since it is assumed that inadvertent mispositioning of such valves is highly unlikely. ANO has an established process to determine when system valve position verifications are performed. This may include verification of valve positions prior to entering the mode of applicability for a given system, especially if significant valve manipulations or maintenance occurred within the system boundary.

CSS operability and availability is assured, in part, by verifying CSS valve positions whenever circumstances exist that may call the system alignment into question. This may include valve position verifications following extended operation in conditions where CSS operability is not required such as in Modes 5 or 6. Verifications are also made on portions of the system that are impacted by significant maintenance, regardless of plant mode. Since it is improbable that a secured valve could be inadvertently re-positioned, and because secured valve positions of important systems are verified at least each refueling outage, addition of the phrase, "that is not locked, sealed, or otherwise secured in position," is acceptable. Deletion of the wording, "to take suction from the RWT on a Containment Pressure-High-High test signal," is acceptable because such wording draws unnecessary focus to the suction piping of the CSS pump while the intent of the SR is to verify the entire flow path (i.e., suction and discharge of the CSS pump). The current wording has not been changed or amended since the first issuance of the ANO-2 TSs. The proposed change updates this wording to be consistent with NUREG-1432 and removes ambiguities.

Surveillance Requirement 4.6.2.1.b (6.3% allowable pump degradation value)

The 6.3% allowable pump degradation was developed in an original (circa 1978) design calculation. The calculation used outputs from a 1970s vintage "system resistance" calculation. The calculation made use of system curves drawn onto pump curves and adjusted pump curves utilizing the pump affinity laws. "Case 1b" of the calculation was for one spray pump train at 2000 gpm taking suction from the refueling water tank. In case 1b, containment spray pump "B" was the limiting pump at 6.3% degradation. While the 1978 analysis is less sophisticated than the analytical tools available today, it is conservative.

The current TS SR was adopted prior to the application of the Maintenance Rule (Reference 3) which requires monitoring and assessing the performance of equipment important to safety and initiation of corrective action prior to degradation reaching operability limits. Requiring verification of adequate pump head in accordance with the Inservice Testing Program is sufficient to note and track any degradation in pump performance, verify operability limits are maintained, and is consistent with the revised standard TSs. Therefore, the wording of the NUREG-1432, Revision 2 surveillance requirement is adopted in lieu of the current TS wording to verify $\leq$ 6.3% degradation from the original acceptance test pump performance curve. The Inservice Testing Program is required by TS 6.5.8.

The NRC issued a safety evaluation report on November 13, 2000 (2CNA110002), to permit an increase in the ANO-2 Containment Building design pressure from 54 to 59 psig. As a result of increasing the containment building design pressure to 59 psig, the containment spray pump performance requirements were recalculated at the new pressure. The reanalysis removed some of the excess conservatism built into the original calculations. Lower containment spray flow rates were assumed in the safety analysis as a consequence of the increase in design pressure. As a result of the analysis, the allowable containment spray pump degradation may be increased above 6.3% without compromising the required containment spray flow that must be delivered to the containment building to satisfy the safety analysis. The reanalysis shows that "A" containment spray pump could degrade by 11.7% and "B" containment spray pump by 9.8%. Section XI of the ASME Boiler and Pressure Vessel Code allows pump degradation up to 10%. The reanalyzed value of 9.8% is, therefore, more limiting.

There are, and have been, no operability concerns with the current 6.3% degradation value in Technical Specification 4.6.2.1.b. However, the 6.3% value is unnecessarily restrictive. After adjustments for instrument uncertainty, a degradation of only 4.2% is permitted. Such a small operating band provides little margin for testing anomalies. Testing irregularities, such as data point scatter for example, could challenge the 6.3% degradation value. The proposed change would provide additional margin for operation of the containment spray pumps and would remain within the 10% pump degradation allowance of Section XI of the ASME Code.

5.0 REGULATORY ANALYSIS

5.1 Applicable Regulatory Requirements/Criteria

The proposed change has been evaluated to determine whether applicable regulations and requirements continue to be met.

General Design Criteria

GDC 38 "Containment Heat Removal," GDC 39 "Inspection of Containment Heat Removal System," and GDC 40 "Testing of Containment Heat Removal System" require the containment heat removal system to be designed to remove heat from the reactor containment and to permit appropriate periodic pressure and functional testing. The proposed change will not affect conformance with these criteria.

ANO-2 Safety Analysis Report Considerations

Section 3.6, "Protection against Dynamic Effects Associated With The Postulated Rupture of Piping" contains the Seismic Category 1 requirements of the CSS. The proposed change does not affect these requirements.

Section 6.2.2, "System Design" addresses the system design and testing/inspection of the containment heat removal system. The proposed change does not affect these requirements.

Chapter 15, "Accident Analysis" discusses several important systems, identified as engineered safety feature systems which have been provided to prevent clad and fuel melting, to limit chemical reactions, and to protect the health and safety of the general public. The CSS is listed as one of these systems. The proposed change does not affect the ability of this system to fulfill its safety function.

Entergy has determined that the proposed change requires no exemptions or relief from regulatory requirements, other than the TS, and does not affect conformance with any GDC differently than described in the SAR. Additionally, no CSS functions described in the SAR are impacted by the proposed change. Approval of this change will maintain conformance with 10CFR50.36 (Reference 4) and 10CFR50.65 (Reference 3).

5.2 No Significant Hazards Consideration

The proposed change modifies the surveillance testing requirements for the containment spray system (CSS) as specified in Surveillance Requirement (SR) 4.6.2.1. This change removes the specific containment spray pump performance criteria and instead requires testing to be performed in accordance with the Inservice Testing Program. In addition, the revision will delete the requirement to verify the position of valves that are locked, sealed, or otherwise secured in their correct position. The proposed changes are consistent with NUREG-1432, Revision 2, "Standard Technical Specifications Combustion Engineering Plants."

Entergy Operations, Inc. (Entergy) has evaluated whether a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10CFR50.92, "Issuance of amendment," as discussed below.

Font size and page formatting have also been updated to that used by a large part of the nuclear industry. Since this portion of the change is administrative and does not change any technical information associated with the affected technical specification, the administrative changes are not evaluated with the proposed SR change described below.

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   Analyzed events are assumed to be initiated by the failure of plant structures, systems, or components. Altering the surveillance requirements for the CSS does not increase the probability that a failure leading to an analyzed event will occur. The CSS components are passive until an actuation signal is generated. This change does not increase the failure probability of the CSS components. Therefore, the probability of occurrence for a previously analyzed accident is not significantly increased.

   The CSS is primarily designed to mitigate the consequences of a loss of coolant accident (LOCA) or main steam line break (MSLB) accident. The proposed change does not affect any of the assumptions used in the deterministic LOCA or MSLB analyses. Hence the consequences of accidents previously evaluated do not change.

   Therefore, the change associated with modifying the CSS surveillance requirements does not involve an increase in the probability or consequences of any accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed change does not change the design or configuration of the plant. No new equipment is introduced, nor will any installed equipment be operated in a new or different manner. No changes are proposed to the plant's operating parameters or setpoints at which protective or mitigative actions are initiated. Additionally, no substantive changes are proposed to the procedures which ensure the plant remains within analyzed limits or the procedures relied upon to respond to off-normal events. As such, no new failure modes are being introduced. The proposed change does not alter assumptions made in the safety analysis or licensing basis.

   Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No.

   The proposed change associated with modifying the surveillance requirements for the CSS does not affect the limiting conditions for operation used in the deterministic analysis to establish the margin of safety. The margin of safety is established through equipment design, operating parameters, and the setpoints at which automatic actions are initiated. None of these are adversely impacted by the proposed change. Sufficient equipment remains available to actuate upon demand for the purpose of mitigating a transient event.

   Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, Entergy concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10CFR50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.3 Environmental Considerations

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10CFR51.22(c)(9). Therefore, pursuant to 10CFR51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 PRECEDENCE

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. In addition, the relocation of specific containment spray pump testing criteria to the Inservice Testing Program is consistent with TSTF-78 and, subsequently NUREG-1432. These changes have been adopted by numerous other U.S. commercial nuclear power plants through conversion to the improved technical specifications of NUREG-1430, 1431, 1432, 1433, and 1434. Therefore, ample precedence exists among the plants, including several Combustion Engineering plants, for adoption and approval of this change.

Surveillance Requirement 4.6.2.1.a.1 (verification of valve position)

The wording to exclude requiring verification of valves that are locked, sealed, or otherwise secured in their correct position was evident in Revision 0 of NUREG-1432; therefore, no TSTF item exists that supports this modification. It is noted that TSTF-45 (Reference 5), a closely related item regarding containment isolation valves, was approved by the NRC on September 18, 1996. TSTF-45 revised the Section 3.6 valve line up surveillance requirements to specify that only containment isolation valves which are not locked, sealed, or otherwise secured are required to be verified.

Surveillance Requirement 4.6.2.1.b (6.3% allowable pump degradation value)

TSTF-78 (Reference 6) was approved by the NRC on September 18, 1996. This TS change traveler was submitted to address the inconsistencies in the surveillance requirements for the various ASME Section XI pumps. TSTF-78 removed the specific differential pressure limit used to measure containment spray pump performance. In particular, the change traveler removed the quantitative value of the required differential pressure and relocated it to the Inservice Testing Program.

ANO-2 uses containment spray pump degradation in lieu of differential pressure for measuring pump performance. However, the rationale for relocating the testing acceptance criterion to the Inservice Testing Program is the same regardless of which parameter is selected to measure pump performance.

7.0 REFERENCES

1. NUREG-1432, Revision 2, "Standard Technical Specifications Combustion Engineering Plants," April 30, 2001.

2. ANO-2 Safety Analysis Report, Section 3.1.4, "Fluid Systems," Chapter 11.0, "Radioactive Waste Management," and Chapter 15.0, "Accident Analysis."

3. 10CFR50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants."

4. 10CFR50.36, "Technical specifications."

5. Industry/TSTF Standard Technical Specification Change Traveler, "Exempt verification of CIVs that are not locked, sealed or otherwise secured," (WOG-39, Revision 0) (TSTF-45, Revision 2) June 27, 1999.

6. Industry/TSTF Standard Technical Specification Change Traveler, "Surveillance Requirement for ASME Section XI Pumps," (CEOG-32, Revision 0) (TSTF-78) April 2, 1998.

Attachment 2

2CAN050304

Proposed Technical Specification Changes (mark-up)

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION, COOLING, AND pH CONTROL SYSTEMS

CONTAINMENT SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent containment spray systems shall be OPERABLE with each spray system capable of taking suction from the RWT on a Containment Spray Actuation Signal (CSAS) and automatically transferring suction to the containment sump on a Recirculation Actuation Signal (RAS). Each spray system flow path from the containment sump shall be via an OPERABLE shutdown cooling heat exchanger.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

With one containment spray system inoperable, restore the inoperable spray system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each containment spray system shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verify~~ing that~~ each containment spray ~~each valve (~~manual, power operated, and ~~or~~ automatic valve~~)~~ in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position~~ed to take suction from the RWT on a Containment Pressure High High test signal~~.

2. Verifying that the system piping is full of water from the RWT to at least elevation 505' (equivalent to > 12.5% indicated narrow range level) in the risers within the containment.

b. ~~By V~~verify~~ing that~~ each containment spray pump's developed head at the flow test point is greater than or equal to the required developed head~~demonstrates degradation of ≤ 6.3% from its original acceptance test pump performance curve~~ when tested pursuant to the Inservice Testing Program.

Attachment 3

2CAN050304

Proposed Technical Specification Changes (clean pages)

CONTAINMENT SYSTEMS

3/4.6.2 DEPRESSURIZATION, COOLING, AND pH CONTROL SYSTEMS

CONTAINMENT SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent containment spray systems shall be OPERABLE with each spray system capable of taking suction from the RWT on a Containment Spray Actuation Signal (CSAS) and automatically transferring suction to the containment sump on a Recirculation Actuation Signal (RAS). Each spray system flow path from the containment sump shall be via an OPERABLE shutdown cooling heat exchanger.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

With one containment spray system inoperable, restore the inoperable spray system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each containment spray system shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.

2. Verifying that the system piping is full of water from the RWT to at least elevation 505' (equivalent to > 12.5% indicated narrow range level) in the risers within the containment.

b. 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.