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January 27, 2000

2CAN010007

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

Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Removal of Reactor Vessel Specimen Schedule from Technical Specifications and Request for Change of the Reactor Vessel Specimen Schedule

Gentlemen:

Attached for your review and approval is a proposed change to the Arkansas Nuclear One-Unit 2 (ANO-2) Technical Specification (TS) 4.4.9.1.2 and Table 4.4-5 requirements for reactor vessel material irradiation surveillance specimens removal and examination intervals. The proposed change revises TS 4.4.9.1.2 and deletes Table 4.4-5 pursuant to guidance provided in Generic Letter (GL) 91-01, "Removal of the Schedule for the Withdrawal of Reactor Vessel Material Specimens from Technical Specifications," dated January 4, 1991. The Generic Letter provides guidance for the preparation of a request for license amendment to remove from the TS the schedule for the withdrawal of reactor vessel material surveillance specimens.

The capsule removal schedule is currently maintained in the TS and the Unit 2 Safety Analysis Report (SAR). Removal of the schedule for withdrawal of reactor vessel material specimens from TS is considered a line item TS improvement. The proposed amendment is consistent with the recommendations of the Commission Policy Statement on Technical Specification Improvements.

Also included in this letter is a proposed change to the surveillance specimen removal schedule. In accordance with NRC Administrative Letter 97-04, "NRC Staff Approval for Changes to 10 CFR Part 50, Appendix H, Reactor Vessel Surveillance Specimen Withdrawal Schedules," NRC staff verification of the surveillance specimen removal schedule is requested. It is desired to allow removal of a specimen capsule during the scheduled fall 2000 ANO-2 refueling outage (2R14) at approximately 15.5 Effective Full Power Years. This schedule conforms to ASTM E185-82, "*Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels*" as referenced by 10CRF50, Appendix H.

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The proposed TS 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 considerations. The bases for these determinations are included in the attached submittal.

This change is needed to support the ANO-2 2R14 refueling outage, which commences on September 15, 2000. Entergy Operations requests NRC approval by August 15, 2000 and that the effective date for this change be September 15, 2000. Although this request is neither exigent nor emergency, your prompt review is requested.

Very truly yours,

CRH/dm
Attachments

To the best of my knowledge and belief, the statements contained in this submittal are true.

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for Johnson **County and the State of Arkansas, this** 27 **day of** January**, 2000.**

Diana M. Tapp
Notary Public
My Commission Expires 11-8-2000

OFFICIAL SEAL
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ATTACHMENT

TO

2CAN010007

PROPOSED TECHNICAL SPECIFICATION

AND

RESPECTIVE SAFETY ANALYSES

IN THE MATTER OF AMENDING

LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT TWO

DOCKET NO. 50-368

DESCRIPTION OF PROPOSED CHANGE

Technical Specification 4.4.9.1.2

Arkansas Nuclear One – Unit 2 (ANO-2) Technical Specification (TS) 4.4.9.1.2 requires the reactor vessel material irradiation surveillance specimens be removed and examined at the intervals specified in TS Table 4.4-5. The proposed change will remove Table 4.4-5 from the TS and be referenced in the ANO-2 Safety Analysis Report (SAR). This change is pursuant to the guidance provided in Generic Letter 91-01, "*Removal of the Schedule for the Withdrawal of Reactor Vessel Material Specimens From Technical Specifications*," dated January 4, 1991.

Reactor Vessel Specimen Schedule

ANO-2 desires to remove a specimen capsule during the scheduled fall 2000 refueling outage (2R14) at approximately 15.5 Effective Full Power Years (EFPY). The current scheduled removal date is for 19 EFPY.

BACKGROUND

Technical Specification 4.4.9.1.2

The ability of the reactor pressure vessel to resist fracture is a primary factor in ensuring the integrity of the reactor coolant system. The beltline region is the most critical section of the reactor vessel since it is subjected to high levels of neutron irradiation. The low-alloy ferritic steels used in the beltline region of the vessel exhibit some increase in ultimate and yield strength properties with a corresponding decrease in ductility after irradiation. Appendix H to 10CFR50, "*Reactor Vessel Materials Surveillance Program Requirements*," requires that a program to monitor reactor vessel material be in place during the licensed period for the plant. To ensure surveillance specimens are removed from the vessel and tested, as required by Appendix H, the schedule for surveillance capsule withdrawal has been maintained in the ANO-2 TS Table 4.4-5.

Generic Letter 91-01 provides guidance for the preparation of a license amendment request to remove the schedule for the withdrawal of reactor vessel material surveillance specimens from the Technical Specifications (TS). The control of changes to this surveillance schedule by way of a license amendment to modify the TS is consistent with the requirements of Section II.B.3 of Appendix H to 10CFR50. These requirements address the submittal of a proposed withdrawal schedule, as specified in 10CFR50.4, and the Nuclear Regulatory Commission (NRC) approval before its implementation.

Reactor Vessel Specimen Schedule

In accordance with NRC Administrative Letter 97-04, NRC staff approval is required for the proposed change to the surveillance specimen removal schedule. The change conforms to ASTM E185-82, "*Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels*" as referenced by 10CFR50, Appendix H.

DISCUSSION OF CHANGE

Technical Specification 4.4.9.1.2

Consistent with the guidance contained in Generic Letter 91-01, TS Table 4.4-5 will be removed from the TS. The schedule for capsule withdrawal is already included in the Unit 2 SAR, Table 5.2-12. The related TS surveillance requirement 4.4.9.1.2 and associated bases will be modified to reflect the SAR location for the capsule removal schedule. Removal of the table from the TS is considered administrative and does not change compliance with 10CFR50, Appendix H.

Reactor Vessel Specimen Schedule

The schedule listed in Technical Specification Table 4.4-5 originally had the first capsule being withdrawn at 5 EFPY. To support work being performed by the industry related to fluence monitoring, ANO-2 revised the schedule to pull the capsule at the end of Cycle 2 (1.69 EFPY).

The fluence determination used in the development of the current 21 EFPY pressure-temperature limits (specification 3/4.4.9 for pressure-temperature limits and specification 3/4.4.12 for the low temperature overpressure protection limits) was based on a linear extrapolation from the one data point at the end of Cycle 2 out to 21 EFPY. Inherent in that analysis was the continued use of "high leakage" cores. In Cycle 7, the core was changed to a "low leakage" design, in part to reduce the vessel fluence. This reduction in the vessel fluence was not accounted for in the determination of the 21 EFPY fluence values.

The uncertainties contained in the calculations for neutron fluence are impacted by core neutron source, which is determined by the power distribution, power level, and fuel management scheme. The core inlet temperature (T_{cold}) and enrichment/poisons also impact the calculations.

The current removal schedule at 19 EFPY will occur during ANO-2 Cycle 17 (scheduled for fall of 2003). This is one cycle after the power uprate and two cycles after the replacement of the steam generators. The Cycle 16 and possibly the Cycle 17 power uprated cores will be of a higher leakage core design than the current core designs. Additionally, in letter dated November 2, 1998, Entergy Operations stated our intent to revise the ANO-2 surveillance capsule withdrawal schedule to the 2R14 refueling outage in response to Generic Letter 92-01.

Since Cycle 2 the inlet temperature has been decreased several times. With the new steam generator replacement, the inlet temperature will be increased to near the values in Cycle 1. In addition, the poison in the fuel has changed from boron carbide to gadolinium and will later change to erbium. The fuel enrichment has also increased through reload fuel cycles.

Based on the above discussions, it is prudent to change the schedule for the withdrawal of the next surveillance capsule. The schedule contained in the ANO-2 SAR will be revised such that capsule withdrawal will occur during the steam generator replacement outage (at the end of Cycle 14, approximately 15.5 EFPY). This should allow sufficient time to have the capsule analyzed and to adjust the Pressure/Temperature (P/T), Low Temperature Overpressure Protection (LTOP), and Pressurized Thermal Shock (PTS) analyses prior to exceeding the basis for the fluence values listed in the current TS.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Entergy Operations, Inc. is proposing that the Arkansas Nuclear One Unit 2 (ANO-2) Operating License be amended to remove TS Table 4.4-5 and to modify the wording in Technical Specification 4.4.9.1.2 and related bases to reflect the new location (ANO-2 SAR, Table 5.2-12) of the information contained in the Table.

An evaluation of the proposed change has been performed in accordance with 10CFR50.91(a)(1) regarding no significant hazards considerations using the criteria in 10CFR50.92(c). A discussion of the criteria as they relate to this amendment request follows:

Criterion 1 - Does Not Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated.

The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated because the accident conditions and assumptions are not affected by the proposed Technical Specification (TS) change. The Reactor Vessel Material Surveillance Program ensures the availability of data to update the in-service operating temperature and pressure limits as well as the Low Temperature Overpressure Protection (LTOP) and Pressurized Thermal Shock (PTS) analyses. The schedule identifying the withdrawal of the surveillance specimens will be removed from the TSs; however, the proposed TS 4.4.9.1.2 will continue to require that the specimens be removed and examined to determine changes in their material properties, as required by Appendix H to 10CFR50. The proposed surveillance specimen removal schedule conforms to ASTM E185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels" as referenced by 10CFR50, Appendix H. No changes to the design of the facility have been made. No new equipment has been added or removed and no operational setpoints have been altered.

Therefore, this change does <u>not</u> involve a significant increase in the probability or consequences of any accident previously evaluated.

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Criterion 2 - Does Not Create the Possibility of a New or Different Kind of Accident from any Previously Evaluated.

The proposed change does not add or modify any equipment nor does the proposed change involve any operational changes to any plant systems or Limiting Conditions for Operation (LCO). As required by Appendix H, the proposed change will continue to require the specimens be removed and examined to determine changes in their material properties. This change does not introduce any new accident or malfunction mechanism nor is any physical plant change required.

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

Criterion 3 - Does Not Involve a Significant Reduction in the Margin of Safety.

Removal of the schedule from Technical Specifications is an administrative change and will have no impact on the margin of safety. Since changes to the reactor vessel material surveillance specimens withdrawal schedule are controlled by the requirements of Appendix H to 10CFR50, removing the schedule from Technical Specifications will not result in any loss of regulatory control. In addition, to ensure the surveillance specimens are withdrawn at a proper time, surveillance requirement 4.4.9.1.2 will continue to require specimens be removed and examined per the ANO-2 Safety Analysis Report to determine changes in their material properties, as required by Appendix H.

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

Therefore, based upon the reasoning presented above and the previous discussion of the amendment request, Entergy Operations has determined that the requested change does not involve a significant hazards consideration.

ENVIRONMENTAL IMPACT EVALUATION

10 CFR 51.22(c) provides criteria for and identification of licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration, (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released off-site, or (3) result in a significant increase in individual or cumulative occupational radiation exposure. Entergy Operations, Inc. has reviewed this license amendment and has determined that it meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the proposed license amendment. The basis for this determination is as follows:

1. The proposed license amendment does not involve a significant hazards consideration as described previously in the evaluation.

2. As discussed in the significant hazards evaluation, this change does not result in a significant change or significant increase in the radiological doses for any Design Basis Accident. The proposed license amendment does not result in a significant change in the types or a significant increase in the amounts of any effluents that may be released off-site.

3. The proposed license amendment does not result in a significant increase to the individual or cumulative occupational radiation exposure because this change is administrative and unrelated to effluents generated or released from the facility. Therefore, the proposed change has no affect on either individual or cumulative occupational radiation exposure.

PROPOSED TECHNICAL SPECIFICATION CHANGES

SURVEILLANCE REQUIREMENTS

4.4.9.1.1 The Reactor Coolant System temperature and pressure shall be determined to be within the limits at least once per 30 minutes during system heatup, cooldown, and inservice leak and hydrostatic testing operations.

4.4.9.1.2 The reactor vessel material irradiation surveillance specimens shall be removed and examined, to determine changes in material properties, at the intervals shown in SAR Table 5.2-12. The results of these examinations shall be used to update Figures 3.4-2A, 3.4-2B and 3.4-2C.

Table Deleted
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The Lowest Service Temperature is the minimum allowable temperature at pressures above 20% of the pre-operational system hydrostatic test pressure (624 psia). This temperature is defined as equal to the most limiting RTNDT for the balance of the Reactor Coolant System component (conservatively estimated as 50°F) plus 100°F, per Article NB 2332 of Section III of the ASME Boiler and Pressure Vessel Code. Temperature instrument uncertainty is conservatively estimated as 20°F.

The horizontal line between the minimum boltup temperature and the Lowest Service Temperature is defined by the ASME Boiler and Pressure Vessel Code as 20% of the pre-operational hydrostatic test pressure.

The minimum boltup temperature is the minimum allowable temperature at pressures below 20% of the pre-operational system hydrostatic test pressure. The minimum is defined as the initial RT_{NDT} for the material of the higher stressed region of the reactor vessel plus any effects for irradiation per Article G-2222 of Section III of the ASME Boiler and Pressure Vessel Code. The initial reference temperature of the reactor vessel and closure head flanges was determined using the certified material test reports and Branch Technical Position MTEB 5-2. The maximum initial RT_{NDT} associated with the stressed region of the vessel flange is 30°F. The minimum boltup temperature including temperature instrument uncertainty is 30°F + 20°F = 50°F. However, for additional conservatism, a minimum boltup temperature of 70°F is utilized.

The number of reactor vessel irradiation surveillance specimens and the frequencies for removing and testing these specimens are provided in SAR Table 5.2-12 to assure compliance with the requirements of Appendix H to 10 CFR Part 50.

The limitations imposed on the pressurizer heatup and cooldown rates are provided to assure that the pressurizer is operated within the design criteria assumed for the fatigue analysis performed in accordance with the ASME Code requirements.

MARKUP OF CURRENT ANO-2 TECHNICAL SPECIFICATIONS

(FOR INFO ONLY)

SURVEILLANCE REQUIREMENTS

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~~TABLE 4.4-5~~

~~REACTOR VESSEL MATERIAL IRRADIATION SURVEILLANCE SCHEDULE~~

~~SPECIMEN~~	~~REMOVAL INTERVAL~~
~~1.~~	~~1.69 EFPY~~
~~2.~~	~~19 EFPY~~
~~3.~~	~~30 EFPY~~
~~4.~~	~~Standby~~
~~5.~~	~~Standby~~
~~6.~~	~~Standby~~

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