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R. M. Krich
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Nuclear Licensing

July 1, 2010

10 CFR 50.4
10 CFR 50.55a

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 1
Facility Operating License No. NPF-90
NRC Docket No. 50-390

Subject: **American Society of Mechanical Engineers Request for Relief PV-05**

In accordance with 10 CFR 50.55a, "Codes and Standards," the Tennessee Valley Authority (TVA) requests NRC approval of Request for Relief PV-05. The request for relief is to extend the test intervals for certain American Society of Mechanical Engineers (ASME) Code Class 3 relief valves on a one-time basis until restart of Unit 1 after the Cycle 10 refueling outage, which is scheduled to occur at the end of April 2011. The request for relief is provided in the enclosure.

TVA requests approval of this request for relief by September 1, 2010, in order to permit continued plant operation until the Cycle 10 refueling outage. The Code of Record for the current second interval is ASME/American National Standards Institute, "Code for Operation and Maintenance of Nuclear Power Plants," 2001 Edition through 2003 Addenda. This relief request was discussed with representatives of NRC on June 22, 2010.

There are no commitments associated with this submittal. If you have any questions about this change, please contact Kevin Casey at (423) 751-8523.

Respectfully,

P. E. Culle
for

R. M. Krich

Enclosure: Request for Relief PV-05

cc: See page 2

A047
NRR

cc (Enclosure):

NRC Regional Administrator – Region II
NRC Resident Inspector – Watts Bar Nuclear Plant

Enclosure

Tennessee Valley Authority
Watts Bar Nuclear Plant, Unit 1
Second 10-Year Interval

REQUEST FOR RELIEF PV-05

Systems/Components For Which Relief Is Requested

Watts Bar Nuclear Plant (WBN) Essential Raw Cooling Water and Component Cooling System Thermal Relief Valves:

- Code Class 3 thermal relief valve, 1-RFV-67-573C-A (reference drawing 1-47W845-3)
- Code Class 3 thermal relief valve, 1-RFV-70-584 (reference drawing 1-47W859-2)

Applicable Code Edition and Addenda

For the current, second 10-year inservice testing (IST) interval, the applicable Code edition is the American Society of Mechanical Engineers (ASME), "Code for Operation and Maintenance of Nuclear Power Plants" (ASME OM Code), 2001 Edition through 2003 Addenda. The second interval began on May 27, 2007 and will end on May 26, 2016.

Applicable Code Requirement

ASME OM Code, 2001 Edition through 2003 Addenda, Mandatory Appendix I, I-1390, "Tests shall be performed on all Class 2 and 3 relief devices used in thermal relief application every 10 years, unless performance data indicate more frequent testing is required. In lieu of tests, the Owner may replace the relief devices at a frequency of every 10 years, unless performance data indicate more frequent replacements are necessary."

Code Requirement From Which Relief Is Requested

Relief is being requested from the requirement to test or replace the identified valves within 10 years of the date of the last test or replacement. This relief is to extend the test/replacement interval of thermal relief valves 1-RFV-67-573C-A and 1-RFV-70-584 beyond 10 years on a one-time basis from September 14, 2010 and September 27, 2010, respectively, to the Cycle 10 refueling outage which is currently scheduled for completion at the end of April 2011.

Reason for Request

During an Operations review for development of clearances for two of the WBN thermal relief valve work documents, it was identified that the periodic replacements of these two valves were improperly categorized as being able to be tested/replaced while the unit is online. As a result, the 10-year applicable ASME OM Code requirements for testing/replacement will be exceeded after September 14 and 27, 2010, respectively, seven months before the Cycle 10 refueling outage. TVA documented the scheduling discrepancies in the corrective action program and performed a review to confirm the extent of condition for all IST related relief valve testing for WBN, Unit 1. In accordance with 10 CFR 50.55a(a)(3)(ii), TVA requests relief from the applicable ASME OM Code requirements for 1-RFV-67-573C-A and 1-RFV-70-584 until restart from the Unit 1 Cycle 10 refueling outage, which is currently scheduled to occur by the end of April 2011. The 10-year test/replacement intervals would be extended by approximately seven months. NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," Revision 1, Section 2.5, "Relief Requests and Proposed Alternatives," states that nuclear power plant licensees may also propose alternatives to ASME Code requirements if compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The NRC has interpreted "hardship" to mean a high degree of difficulty or an adverse impact on plant operation, as illustrated by examples, including:

- having to enter multiple Technical Specification (TS) Limiting Conditions for Operation
- inaccessibility
- replacing equipment or in-line components

Relief valves 1-RFV-67-573C-A and 1-RFV-70-584 accommodate thermal expansion of isolated and out-of-service components. Removal and testing of the valves is performed when the unit is in a refueling outage because of the adverse affect to the operating unit. Isolation of these valves for testing/replacement would result in unnecessary risk to safety-related equipment and power generation as described below.

Testing relief valve 1-RFV-70-584 before the Unit 1 Cycle 10 refueling outage would constitute a hardship, because the clearance boundary needed to replace this Chemical and Volume Control System (CVCS) Seal Water Heat Exchanger outlet thermal relief valve would result in removing the CVCS Seal Water Heat Exchanger from service. The main concern with this taking this portion of the system out-of-service for performance of the valve replacement is that in the event of a small break Loss of Coolant Accident, the CVCS Centrifugal Charging Pump (CCP) mini-flow would not be cooled. This could cause the pumped fluid to increase in temperature, which could create net positive suction head (NPSH) issues for the CCP. The Seal Water Heat Exchanger provides cooling for the water returning from the Reactor Coolant Pump (RCP) seals to the Volume Control Tank. Without the additional margin for saturation temperature and NPSH provided by the CVCS Seal Water Heat Exchanger, the safety-related CCP could cavitate, which could cause component damage and resultant loss or degradation of the CCP function.

Testing relief valve 1-RFV-67-573C-A before the Unit 1 Cycle 10 refueling outage would constitute a hardship, because the clearance boundary needed for this Lower Containment Cooler Header thermal relief valve would remove the associated Loop 3 lower containment coolers (Control Rod Drive Mechanism (CRDM), Lower Compartment, and RCP motor cooler) from service while the unit is online. Currently the associated Loop 3 RCP motor discharge cooler, all four Lower Compartment coolers, and three CRDM coolers are in service. The current river temperature is 76°F and the lower containment temperature is 105°F with a TS maximum limit of 117.5°F. As the river temperature increases over the course of the summer, more cooling capacity is required in lower containment. It is expected that the fourth, and last, available CRDM cooler will be placed inservice before July 1, 2010. As all available coolers are expected to be in service, there will be no means to swap a cooling loop for another standby loop to allow this testing or replacement work to proceed. Additionally, this activity would produce a substantial amount of radioactive waste that would not be generated during an outage due to the method required to drain the header while the unit is in operation. This activity has an estimated duration of 24-48 hours, which could cause the lower containment temperature to increase to the point of TS required unit shutdown since 25% of the lower containment cooling units would have their cooling water removed from service.

Basis for Relief

Both thermal relief valves 1-RFV-67-573C-A and 1-RFV-70-584 were tested during the first inservice testing interval under the Augmented IST Program using the WBN Preventive Maintenance Program. Maintenance history shows that when last tested, 1-RFV-67-573C-A was as-found tested at 175 psig and 1-RFV-70-584 was as-found tested at 144 psig.

It is not considered likely that either valve would be challenged to perform. A long-term containment isolation signal that could allow the contained fluid to heat up and expand so that 1-RFV-67-573C-A would be required to actuate is unlikely. In the case of 1-RFV-70-584, actuation is unlikely because the piping being served is only isolated by the very manual valves that WBN has deemed are unacceptable to operate at power since that would potentially allow the contained fluid to heat up and expand requiring the device to actuate.

Alternative Examinations

None. The required testing or replacement of both valves will be performed during the Unit 1 Cycle 10 refueling outage scheduled to begin on March 20, 2011 and complete by the end of April 2011.

Justification for the Granting of Relief

TVA proposes to extend the 10-year test interval for thermal relief valves 1-RFV-67-573C-A and 1-RFV-70-584 by approximately seven months.

A review of the test and maintenance history for these valves was performed. The test history search consisted of reviewing the test data for the valves during the first IST test interval. The maintenance history was performed by a search of the work management system to identify any maintenance work (non-test) that may have occurred since the last test.

Thermal Relief Valve 1-RFV-67-573C-A is a Target Rock Model 79A-0020. A review of the test history of 1-RFV-67-573C-A showed that this valve failed the as-found setpoint test when the initial test resulted in an opening pressure of 175 psig with a setpoint of 160 (156 to 164) psig. This result was approximately 9.5% higher than the setpoint. The valve was rebuilt and successfully as-left tested at 163 psig. The piping this valve serves has a design pressure of 160 psig and was originally hydrostatically tested during construction to 200 psig in accordance with the requirements of the ASME Section III hydrostatic test program. Therefore, the as-found data from this initial valve test, while high, was still less than the pressure used during hydrostatic testing.

The only maintenance activity performed on 1-RFV-67-573C-A since the last test dated in September 2000 was a work order to verify the correct torque of the valve flange as a corrective action for a Problem Evaluation Report.

This valve and the piping served are included in the WBN ASME System Pressure Test (SPT) Program and are periodically examined for leakage once each Inservice Period (approximately every three years). No findings of leakage at the valve have been documented.

A sample of three other WBN Target Rock Model 79A-0020 relief valves found that in each case, all as-found setpoint test results have documented acceptable results with no test failure.

Thermal Relief Valve 1-RFV-70-584 is a Consolidated Dresser Model 1970-2. A review of the test history of 1-RFV-70-584 showed that this valve failed the as-found setpoint test when the initial test resulted in an opening pressure of 144 psig with a setpoint of 150 (146 to 154) psig. This result was approximately 4.0% lower than the setpoint. The valve was adjusted and successfully as-left tested at 150 psig. The piping this valve serves has a design pressure of 150 psig and was originally hydrostatically tested during construction to 188 psig per the requirements of the ASME Section III hydrostatic test program. The as-found data from this initial valve test, while not meeting acceptance criteria, is considered a failure in the conservative direction, and therefore, acceptable. There has been no maintenance activities performed on 1-RFV-70-584 since the last test date in September 2000.

This valve and the piping served are included in the WBN ASME SPT Program and are periodically examined for leakage once each Inservice Period (approximately every three years). No findings of leakage at the valve have been documented.

A sample of three other WBN Consolidated Dresser, Model 1970-2, relief valves found that in two cases, the as-found setpoint test results documented acceptable results with no test failure. In the last sample, the relief valve was as-found tested at 2 psig above the allowed test acceptance criteria of +/-3% of the setpoint.

Based on the review of plant specific experience described above, TVA has concluded that the proposed alternative provides reasonable assurance of operational readiness for these valves. Therefore, in accordance with 10 CFR 50.55a(a)(3)(ii), this interval test extension until the end of the Unit 1 Cycle 10 refueling outage is requested on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Implementation Schedule

This proposed alternative is requested until the restart after the Unit 1 Cycle 10 refueling outage, currently scheduled to begin on March 20, 2011, with the resumption of electric power generation scheduled for April 24, 2011. The duration of this requested extension is approximately seven months.

Precedents

In Reference 1 below, the NRC authorized a one-time extension of the 10-year test/replacement for a thermal relief valve by approximately seven months for Hope Creek Nuclear Generating Station, Unit 1.

References

1. NRC Safety Evaluation dated March 10, 2010 (TAC No. ME3322), Hope Creek Generating Station, Unit 1, Docket No. 50-354.