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**R. M. Krich**  
Vice President  
Nuclear Licensing

April 1, 2011

10 CFR 50.4  
10 CFR 50.55a

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

Sequoyah Nuclear Plant, Units 1 and 2  
Facility Operating License Nos. DPR-77 and DPR-79  
NRC Docket Nos. 50-327 and 50-328

**Subject: American Society of Mechanical Engineers Request for Relief RP-01, Revision 1**

**Reference:** Letter from NRC to TVA, "Sequoyah Nuclear Plant, Units 1 and 2 - Request for Relief from the Requirements of the ASME Code (TAC Nos. MC9537, MC9538, MC9539, MC9540, MC9541, MC9542, MC9543, MC9544, MC9545, MC9546, MC9547, MC9548, MC9549, MC9550, MC9551, MC9552, MC9553, and MC9554)," dated July 27, 2006

In accordance with 10 CFR 50.55a, "Codes and Standards," the Tennessee Valley Authority (TVA) requests NRC approval of Request for Relief RP-01, Revision 1. The original version of RP-01 was authorized by the NRC in the safety evaluation issued July 27, 2006 (Reference).

The Code of Record for the current third 10-year interval is the 2001 Edition through 2003 Addenda of the American Society of Mechanical Engineers, "Code for Operation and Maintenance of Nuclear Power Plants" (OM Code).

The revision to RP-01 requests authorization to include relief from the "preservice" testing requirements of ISTB-5210(a) in addition to relief from the "inservice" testing requirements as authorized in the original version of RP-01. The "Basis for Relief" is unchanged from the original relief request because the basis is applicable to both preservice and inservice testing.

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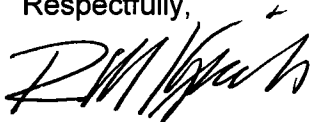
U.S. Nuclear Regulatory Commission  
Page 2  
April 1, 2011

In addition to the "preservice" requirements, the revision to RP-01 corrects the OM Code reference from Section ISTB-5121(b) to Section ISTB-5221(b). ISTB-5121(b) is in the OM Code section for "Centrifugal Pumps (Excluding Vertical Line Shaft Pumps)," whereas the correct reference should be ISTB-5221(b) which is for "Vertical Line Shaft Pumps." The essential raw cooling water (ERCW) screen wash pumps, for which TVA is requesting this revised relief, are vertical line shaft pumps. The sections are essentially the same with only minor changes associated with the pump type. Identification of this correction has been entered in TVA's Corrective Action Program.

The request for relief is provided in the enclosure. TVA requests approval of the proposed alternative by April 30, 2012.

There are no regulatory commitments associated with this submittal. If you have any questions about this change, please contact Rod M. Cook at (423) 751-2834.

Respectfully,



R. M. Krich

Enclosure: Request for Relief RP-01, Revision 1

cc (Enclosure):

NRC Regional Administrator – Region II  
NRC Senior Resident Inspector – Sequoyah Nuclear Plant

**ENCLOSURE**

**TENNESSEE VALLEY AUTHORITY**

**SEQUOYAH NUCLEAR PLANT, UNITS 1 AND 2**

**AMERICAN SOCIETY OF MECHANICAL ENGINEERS CODE RELIEF REQUEST**

**REQUEST FOR RELIEF RP-01, REVISION 1**

**Tennessee Valley Authority  
Sequoyah Nuclear Plant, Units 1 and 2**

**American Society of Mechanical Engineers Code Relief Request**

**Request for Relief RP-01, Revision 1**

**Affected Components**

Essential Raw Cooling Water (ERCW) Screen Wash Pumps (0-PMP-067-0470-A, 0-PMP-067-0477-B, 0-PMP-067-0482-B, 0-PMP-067-0487-A)

**Test Requirement**

The American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code of Record for the Third Inservice Inspection Interval is 2001 Edition with Addenda through 2003. The third interval began on June 1, 2006, and will end on May 31, 2015.

ISTB-5210(a), "Preservice Testing" (Vertical Line Shaft Centrifugal Pumps) states that "In systems where resistance can be varied, flow rate and differential pressure shall be measured at a minimum of five points. If practicable, these points shall be from pump minimum flow to at least pump design flow. A pump curve shall be established based upon the measured points. At least one point shall be designated as the reference point(s). Data taken at the reference point will be used to compare the results of inservice tests. A pump curve need not be established for pumps in systems where the resistance cannot be varied."

ISTB-5221(b), "Group A Test Procedure" (Inservice Testing, Vertical Line Shaft Centrifugal Pumps), states that "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value."

ISTB-5223(b), "Comprehensive Test Procedure" (Inservice Testing, Vertical Line Shaft Centrifugal Pumps) states that "The resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference point. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate determined and compared to the reference flow rate value."

**Test Requirement from Which Relief is Requested**

Relief is being requested from measuring the pump flow rate during the preservice and inservice testing of the screen wash pumps and from measuring differential pressure at five points during preservice testing and establishment of a pump curve.

## **Basis for Relief**

No in-line instrumentation exists to measure flow and the physical configuration of the pump and piping does not allow the use of portable flow measuring equipment such as ultrasonic flow meters. Piping from the discharge of the screen wash pumps is open-ended to the spray nozzles at the traveling screen and is relatively short with multiple elbows, reducers, and valves in different planes. The physical configuration of this piping system is such that no portion of the piping meets the requirements for adequate installation of a permanent flow measuring device, or the utilization of a portable flow measuring device capable of providing accurate flow rate measurements. Therefore, measured flow readings from an installed device may not be repeatable or representative of actual pump flow. Significant system modifications, such as piping rerouting and support redesign, would be required to obtain a configuration that would provide reliable flow readings.

Flow is not the critical parameter for these pumps. The nature of their operation is to ensure that sufficient pressure is maintained at the spray nozzles during flushing operations of the traveling water screens to ensure that sufficient force is exerted on the debris accumulated on the screen to remove it. This can be verified by verifying the effectiveness of the flushing operation.

Maintenance history was reviewed for nozzle plugging and it was determined that nozzle plugging is infrequent. The nozzles are inspected by Operations personnel during spray operation with corrective maintenance initiated as required.

## **Alternative Test**

The preservice, Group A, and comprehensive tests will be performed by setting the system resistance to the same point for each test with the throttle valves full open. Flow will not be measured. The remaining variable that could affect system resistance is the spray nozzles. The condition of the spray nozzles will be inspected during each test performance with corrective actions initiated as necessary, thus providing assurance that the spray nozzle condition will not affect flow rate. With system resistance maintained constant for each test, pump degradation would be identified through changes in differential pressure. Differential pressure is calculated using inlet (based on lake level or suction pressure) and discharge pressure. The pump will be trended for degradation based on differential pressure at this point. Vibration readings will also be taken at this reference point. The pumps will be tested in this manner for the preservice, the quarterly Group A, and the biennial comprehensive test.

Instrument accuracy and acceptance criteria for pump differential pressure and vibration will meet the requirements of Table ISTB-3500-1, "Required Instrument Accuracy," and Table ISTB-5200-1, "Vertical Line Shaft and Centrifugal Pumps Test Acceptance Criteria," respectively, for the appropriate test type.

Preservice test data for differential pressure and vibration data will be evaluated to verify if it represents acceptable pump operation and will be used as reference values for subsequent quarterly Group A and biennial comprehensive tests.

For a new ERCW screen wash pump, the bowl assembly will be tested at the vendor's facility prior to shipment to Sequoyah Nuclear Plant (SQN). This test data is adjusted to account for the pump column (in order to represent the fully assembled pump configuration). A vendor pump curve will then be developed and provided to SQN prior to pump installation.

The preservice pump test for a new ERCW screen wash pump will be performed by setting the throttle valves full open (the same as the Group A and comprehensive tests) and measuring pump differential pressure and vibration. Flow will not be measured. In addition, the condition of the screen spray nozzles will be inspected to verify that the spray covers the screen spray area and the spray force is sufficient to remove any debris present.

The measured differential pressure will be plotted on the vendor pump curve to determine the theoretical flow rate. The differential pressure and theoretical flow rate will then be evaluated against the requirements established in the ERCW screen wash pump design specification, design criteria, and system description. If the pump hydraulic data meets the design requirements with some margin to provide for future degradation and the vibration data analysis is acceptable, the pump will be considered to be operating acceptably. Visual examination of the screen wash spray nozzle performance provides additional positive verification that the pump is operating acceptably and is capable of performing its safety-related function.

### **Conclusion**

Based upon the above discussion, the alternative test provides an acceptable level of quality and safety. Authorization to implement the proposed alternative is requested in accordance with 10 CFR 50.55a(a)(3)(i).

Revision 0 of this relief request was authorized by letter from L. Raghavan, Acting Branch Chief, Plant Licensing Branch (NRC) to Karl W. Singer (TVA), dated July 27, 2006. The safety evaluation transmitted by that letter authorized the use of relief requests, including RP-01, for the third 10-year inservice inspection interval.

### **Precedent**

NRC approval has been previously granted for a similar relief request at Watts Bar Nuclear Plant in NRC letter to Mr. R. M. Krich (Vice President, Nuclear Licensing), "Watts Bar Nuclear Plant, Unit 1, Safety Evaluation of Relief Request PV-02, Revision 1, for the Second 10-Year Interval on the Inservice Testing Program (TAC No. ME4204)," ADAMS Accession No. ML102360191, dated August 30, 2010.