



Tennessee Valley Authority, 1101 Market Street, Chattanooga, TN 37402

CNL-15-196

September 24, 2015

10 CFR 50.55a(f)(6)(i)

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-001

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

Subject: **Watts Bar Nuclear Plant, Unit 1 - Response to Request for Additional Information Regarding Relief Request IST-RR-2 (TAC NO. MF6191)**

- References:
1. Email from NRC to TVA, "WBN 1 draft RAIs MF6191 - Updated Inservice Test Program and Relief Requests for Third Ten Year Interval," dated August 25, 2015
 2. TVA Letter to NRC, CNL-15-014, "Watts Bar Nuclear Plant, Unit 1 - Updated Inservice Test Program and Relief Requests for Third Ten Year Interval," dated April 9, 2015 [ML15103A322]

Enclosed find the Tennessee Valley Authority's (TVA) response to the NRC Request for Additional Information (RAI) (Reference 1) regarding relief request IST-RR-2. Enclosure 1 provides the response to the RAI and Enclosure 2 provides a revised relief request as described in the response to the RAI. This revised version of relief request IST-RR-2 supersedes the version previously submitted by TVA (Reference 2).

There are no new regulatory commitments made in this letter. Should you have questions regarding this submittal, please contact Gordon Arent at (423) 365-2004.

Respectfully,

A handwritten signature in blue ink, appearing to read 'J. W. Shea'.

J. W. Shea
Vice President, Nuclear Licensing

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Enclosures:

1. Response to Request for Additional Information Regarding Relief Request
IST-RR-2
2. Corrected IST-RR-2 - ERCW Screen Wash Pump Test Method

cc (Enclosures):

U.S. Nuclear Regulatory Commission, Region II
NRC Project Manager - Watts Bar Nuclear Plant, Unit 1
NRC Senior Resident Inspector - Watts Bar Nuclear Plant, Unit 1

ENCLOSURE 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING RELIEF REQUEST IST-RR-2

RAI IST-RR-2-1

The last time this relief request was submitted and approved, it was stated that for a new essential raw cooling water (ERCW) screen wash pump, the bowl assembly will be tested at the vendor's facility, and the test data is adjusted to account for the pump column in order for the vendor to develop a pump curve. This process is not mentioned in this relief request. Please state if this process will be performed for a new ERCW screen wash pump during this inservice testing interval.

TVA RESPONSE

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

Relief Request IST-RR-2 has been revised to clarify the proposed alternative testing which includes the vendor test requirements for a new ERCW screen wash pump as described above. Additional detail is provided to describe how the testing will be performed. See Enclosure 2.

**ENCLOSURE 2
RELIEF REQUEST**

**Corrected IST-RR-2 - ERCW Screen Wash Pump Test Method
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*Relief Request in Accordance with 10 CFR 50.55a(f)(6)(i)
Inservice Testing Impracticality*

ASME Code Component(s) Affected

Pump ID	Pump Description	Pump Group	Pump Type
1-PMP-67-431-A	ERCW SCREEN WASH PUMP 1A-A	A	VLS
1-PMP-67-440-B	ERCW SCREEN WASH PUMP 1B-B	A	VLS
2-PMP-67-437-A	ERCW SCREEN WASH PUMP 2A-A	A	VLS
2-PMP-67-447-B	ERCW SCREEN WASH PUMP 2B-B	A	VLS

See the program document contained in Enclosure 1 for additional information for pump group and type.

Applicable Code Edition and Addenda

ASME OM Code, 2004 Edition through 2006 Addenda

Applicable Code Requirement

ISTB-5210 Preservice Testing

- (a) 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 on 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 resistance cannot be varied.

ISTB-5221 Group A Test Procedure

- (b) 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 Comprehensive Test Procedure

- (b) 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.

ENCLOSURE 2 RELIEF REQUEST

IST-RR-2 - ERCW Screen Wash Pump Test Method Page 2 of 4

Impracticality of Compliance

The configuration of the ERCW Screen Wash Pump discharge piping system does not provide straight lengths of piping that will support the installation of a permanent flow measuring device or the utilization of a portable flow measuring device capable of providing accurate flow rate measurements. The lack of permanent or temporary flow instrumentation makes it impractical to measure pump flow as required for performance of Preservice, Group A, and Comprehensive pump tests.

Burden Caused by Compliance

Significant system modifications, such as piping rerouting and support redesign, would be required to obtain a configuration that would provide reliable flow readings. Refer to Basis for Use section for further details.

Proposed Alternative and Basis for Use

Proposed Alternative

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-3510-1, "Required Instrument Accuracy," and Table ISTB-5221-1, "Vertical Line Shaft Centrifugal Pump Test Acceptance Criteria," respectively, for the appropriate test type.

Preservice test data for differential pressure and vibration will be evaluated and when confirmed to represent acceptable pump operation, 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 WBN. This test data will be adjusted by the vendor to account for the pump column (in order to represent the fully assembled pump configuration). The vendor pump curve will then be developed and provided to WBN prior to pump installation.

ENCLOSURE 2 RELIEF REQUEST

IST-RR-2 - ERCW Screen Wash Pump Test Method Page 3 of 4

Proposed Alternate (Continued)

The preservice pump test for a new ERCW screen wash pump will be performed by setting the throttle valves full open (the same position 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 (i.e., pump performance should achieve 350 feet total developed head at 270 gallons per minute). 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 screen wash spray nozzle performance provides additional positive verification that the pump is operating acceptably and is capable of performing its safety-related function.

Basis for Use

The piping design does not provide permanent in-line instrumentation to measure flow. The pump design (vertical line shaft) and discharge piping do not allow the use of portable flow measuring equipment such as ultrasonic flow meters. These pumps take suction from the pump pit directly below the pump deck and are positioned on the deck adjacent to the traveling screens. The discharge piping for each pump is short and open ended, containing several elbows, reducers, and valves prior to entering the traveling screen enclosure. The configuration of this piping system does not provide straight lengths of piping that will support the installation of a permanent flow measuring device or the utilization of a portable flow measuring device capable of providing accurate flow rate measurements. 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 determined by visual observation verifying the effectiveness of the flushing operation.

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

Based on the information provided above, compliance with the Code requirements is impractical and the proposed alternative provides reasonable assurance of the operational readiness of the ERCW Screen Wash Pumps.

ENCLOSURE 2 RELIEF REQUEST

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Duration of Proposed Alternative

This request is for the duration of the first concurrent Unit 1/Unit 2 IST 120-month Inservice Testing interval (third interval for Unit 1 and first interval for Unit 2).

Precedents

This relief request was granted for the WBN Unit 1 second interval (*Watts Bar Nuclear Plant, Unit 1 - Requests for Relief for the Second 10-Year Pump and Valve Inservice Testing Program*, ADAMS Accession Number ML070090504, dated March 9, 2007 and *Watts Bar Nuclear Plant, Unit 1 - Safety Evaluation of Relief Request PV-02, Revision 1, For the Second 10-Year Interval of the Inservice Testing Program*, ADAMS Accession Number ML102360191, dated August 30, 2010).

A similar relief request was granted for Sequoyah Units 1 and 2 third interval (*Sequoyah Nuclear Plant, Units 1 and 2 - Request for Relief from the Requirements of the ASME Code*, ADAMS Accession Number ML061790733, dated July 27, 2006).