



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

CNL-14-142

August 5, 2014

10 CFR 50.4  
10 CFR 50.55a

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

Watts Bar Nuclear Plant, Unit 2  
NRC Docket No. 50-391

**Subject: WATTS BAR NUCLEAR PLANT (WBN) UNIT 2 – RESPONSE TO  
REQUEST FOR ADDITIONAL INFORMATION RELATED TO RELIEF  
REQUESTS ASSOCIATED WITH UNIT 2 INSERVICE TESTING (IST) AND  
PRESERVICE TEST PROGRAMS (MF4118)**

**Reference:** TVA letter, "Watts Bar Nuclear Plant (WBN) Unit 2 - Inservice Test (IST)  
Program/Preservice Test (PST) Program," dated May 8, 2014  
(ML14133A296)

The purpose of this letter is to provide responses to a request for additional information (RAI) from Jeanne Dion to Robert H. Bryan, Jr. via a June 24, 2014 email. The RAI results from NRC review of the relief requests associated with the IST-PST program submittal provided by the reference letter.

The responses to the RAI are provided in the enclosure.

There are no new regulatory commitments contained in this letter. If you have any questions, please contact Gordon Arent at (423) 365-2004.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 5th day of August, 2014.

Respectfully,

A handwritten signature in blue ink, appearing to read "J. W. Shea", written over a horizontal line.

J. W. Shea  
Vice President, Nuclear Licensing

Enclosure  
cc: See Page 2

August 5, 2014

Enclosure:

Responses to Request for Additional Information Related to Relief Requests Associated with Unit 2 Inservice Testing (IST) and Preservice Test Programs (MF4118)

cc (Enclosure):

U. S. Nuclear Regulatory Commission  
Region II  
Marquis One Tower  
245 Peachtree Center Ave., NE Suite 1200  
Atlanta, Georgia 30303-1257

NRC Resident Inspector Unit 1  
Watts Bar Nuclear Plant  
1260 Nuclear Plant Road  
Spring City, Tennessee 37381

NRC Resident Inspector Unit 2  
Watts Bar Nuclear Plant  
1260 Nuclear Plant Road  
Spring City, Tennessee 37381

**ENCLOSURE**  
**Tennessee Valley Authority**  
**Watts Bar Nuclear Plant, Unit 2**  
**Docket No. 50-391**

**Responses to Request for Additional Information Related to Relief Requests Associated  
with Unit 2 Inservice Testing (IST) and Preservice Test Programs (MF4118)**

**RAI-1**

*“For Pump Relief Request IST-RR-2, you state that preservice test data for differential pressure and vibration data will be evaluated to verify that it represents acceptable pump operation. Please explain how this will be done. Also, provide the manufacturer’s pump curve for the ERCW Screen Wash Pump (pump ID 1-PMP-67).”*

**TVA RESPONSE:**

Previously approved Relief Request PV-02, R1 (ML102360191, dated August 30, 2010) is currently in effect for ERCW Screen Wash Pumps 1-PMP-67-431-A, 1-PMP-67-440-B, 2-PMP-67-437-A and 2-PMP-67-447-B. IST-RR-2 is essentially the same as PV-02, R1 and would apply to the U1 and U2 pumps once U2 begins commercial operation.

In the event that preservice pump testing became necessary due to repair, replacement, or maintenance activities that could affect the pump reference values, the affected pump would be tested as a Group A fixed resistance system pump. System resistance would be established at a repeatable condition by verifying the pump discharge throttle valve is locked in its normal full open position and ensuring acceptable condition of the screen wash spray nozzles. Acceptable condition of the spray nozzles would be verified by inspecting the nozzles and verifying that the nozzle spray covers the screen spray area with sufficient force to remove any debris present on the screen. With the pump in operation, pump differential pressure and vibration would be measured. Flow rate would not be measured due to limitations in system configuration. This test method is identical to that performed during previous and future Comprehensive pump tests. Test data (pump differential pressure and vibration) would be compared to (1) the design requirement to produce 350 feet Total Dynamic Head (TDH), (2) the pump vendor curve, and (3) previous trend data for pump differential pressure and vibration.

The U1 1A pump has been replaced by a replacement model (S/N 434485) from Sulzer. The U1 1B pump is scheduled to be replaced in the near future, also with a replacement Sulzer model (S/N 436945). The U2 2A and 2B pumps are the original Johnston models (S/N NJ-1762 and NJ-1764, respectively). Available pump curves for the original and replacement pumps are attached.

## **RAI-2**

*“For Valve Relief Request IST-RR-3, you state that fail safe testing of the reactor head vent valves will be performed at the same frequency as proposed alternative exercise testing, i.e. a cold shutdown frequency. You request relief from the requirements of ISTC-3510 for quarterly fail safe testing, but also provide a Deferred Test Justification DTJ-26 for these valves. ISTC-3510 allows testing to be performed at cold shutdown frequency if it can be justified. Please explain why relief is needed if a cold shutdown testing frequency can be justified for these valves.”*

## **RESPONSE:**

IST-RR-3 only applies to the outboard RPV head vent throttle valves (1/2-FSV-68-396 and -397). IST-RR-3 requests relief only from the ISTC-3510 stroke timing and associated requirements. These throttle valves are solenoid operated valves, however the rate of opening and closing is controlled by a thumbwheel actuator that does not allow meaningful stroke timing due to dependence on operator actions. IST-RR-3 proposes using enhanced maintenance and calibration of the valve controller in lieu of stroke timing and associated requirements. Relief is required because the alternative testing does not meet code requirements for stroke timing and associated requirements, even at the requested cold shutdown and refuel outage frequency.

The cold shutdown justification (DTJ-26) applies to a different set of valves than those in relief request IST-RR-3. DTJ-26 applies to the inboard RPV head vent isolation valves (1/2-FSV-68-394 and -395) stroke timing and fail-safe testing requirements. These isolation valves are solenoid operated valves which are controlled by an open/close handswitch that allows stroke timing and fail-safe testing on a cold shutdown frequency in accordance with the ASME code.

## **RAI-3**

*For Valve Relief Request IST-RR-4, you propose to perform set-pressure testing of the pressurizer safety valves at an approved vendor test facility within 6 months prior to initial reactor criticality. Please provide details about the test environment such as temperature and humidity and describe the test configuration such as orientation of the valves during testing. Also discuss what will be done to assure that the set-pressure will not be altered during shipment and installation.*

## **RESPONSE:**

The pressurizer safety valves will be set pressure tested using steam at the same facility that tests similar or identical valves from TVA and many other nuclear utilities in accordance with the requirements of ASME OM code Appendix I. The valves will be installed on a steam test header at the vendor test facility in their normal vertical operating position. The valves will be thermally stabilized in an environmental chamber to an ambient temperature of 135°F ±5°F for a minimum of 12 hours prior to test. As part of thermal stabilization, the steam accumulator and the valve inlet will be pressurized with saturated steam at 90% of the valve set pressure for a minimum of 6 hours. After thermal stabilization is completed, testing for pre-test seat leakage, as-found or as-left set pressure, and post-test seat leakage will be conducted using saturated steam in the environmental chamber. A final seat leakage test using gaseous nitrogen will be conducted outside the chamber at ambient conditions prior to releasing the valve for return to WBN.

Humidity is not measured during the testing because it is not a code requirement and is not a critical parameter.

The valves are shipped to the vendor test facility and returned in an upright position. They are inspected upon arrival at the vendor test facility and on return to WBN for damage or alteration. The valves are stored in a controlled storage area at the vendor test facility or at WBN during any prolonged non-testing period. Prior to and after testing is completed, the adjusting bolt locking device will be verified and/or torqued to 150 ft-lbs. Lockwires and seals will be installed to prevent changes to the certified valve set pressure. Valves will be lifted using approved lifting points and Foreign Material Exclusion (FME) will be maintained while the valves are removed from the system. The requested alternative is an activity normally performed during refueling outages for U1. The same site organizations and procedures/practices used for handling and shipping the U1 valves will be used to perform this activity. No instances have occurred in U1 where handling, shipping, storage, or removal/installation issues have resulted in changes in set pressure of these valves.

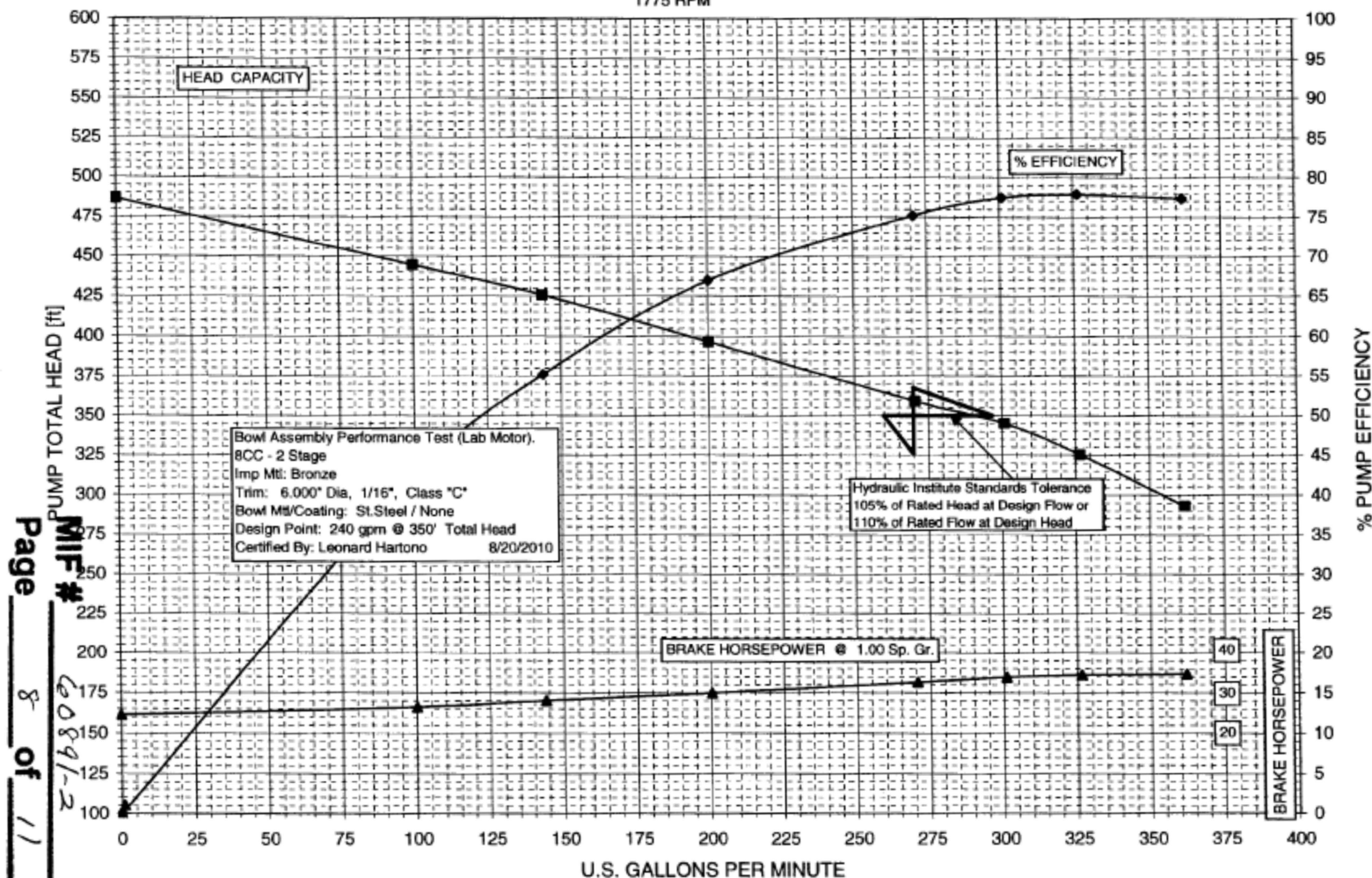
ASME OM Code, Appendix I permits a "drop and swap" approach for testing these valves during the inservice period of the plant. Relief request IST-RR-4 is necessary because the Appendix I requirements applicable during the period before initial electric power generation do not specifically address the use of a "drop and swap" approach for satisfying test requirements.



Reviewed By: MS Date: 8-23-10  
 Title: Project Engineer

**Sulzer Pumps S) Inc.**  
 Brookshire, Texas  
 Customer: Chattanooga Svc. Center  
 Job# 100053334, TC-14939, Rev # 0  
 PO: 4500194480, Fluid: Water  
 1775 RPM

**SULZER**



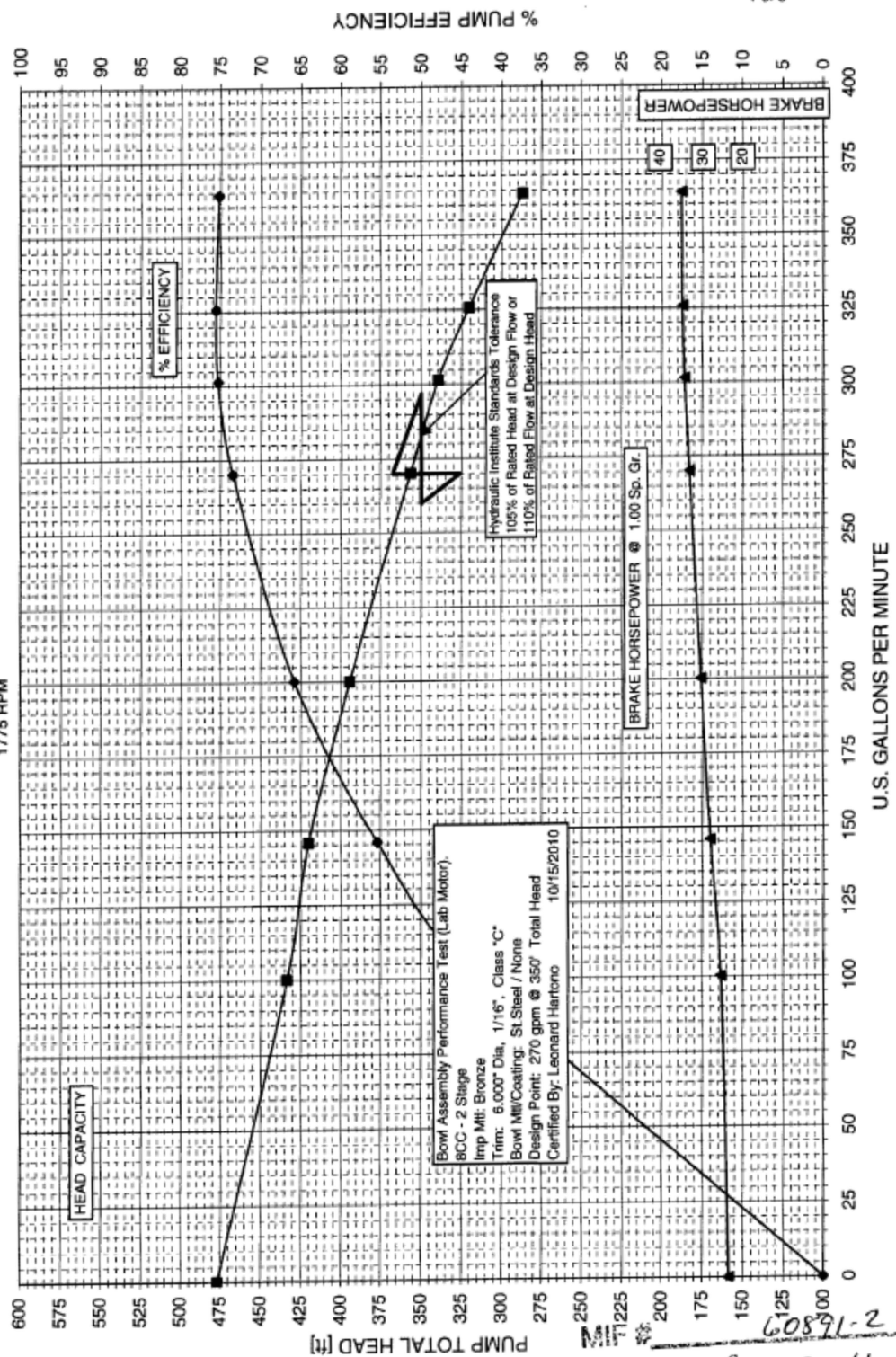
8CC-13\_53334\_TC-14939.xls

**SULZE**

**Sulzer Pump** ) Inc.

Brookshire, Texas  
Customer: Chattanooga Svc. Center  
Job# 100055823, TC-15064, Rev # 0  
PO: 4500205719-0, S/N: 436945, Fluid: Water  
1775 RPM

By *M.B.* Date 10/18/10  
Title: Project Engineer





TC-03944

