U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-397/88-09

Docket No. 50-397

License No. NPF-21

Licensee: Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Facility Name: Washington Nuclear Project No. 2 (WNP-2)

Inspection at: WNP-2 Site, Benton County, Washington

Inspection conducted: March 7 - March 11, 1988

Inspector: C. W. Caldwell — 3/30/88
C. W. Caldwell, Project Inspector — Date Signed

Approved By: C. W. Caldwell FOR — 3/30/88
P. H. Johnson, Chief, — Date Signed
Reactor Projects Section 3

Inspection Summary:

Inspection on March 7 - March 11, 1988 (Report No. 50-397/88-09)

Areas Inspected: Routine project inspection in the areas of scram discharge volume capacity, response to NRC Bulletin 85-03, "Motor Operated Valve Common Mode Failure"; followup of inspector identified items, and on-site review of events. Inspection procedures 25590, 25573, 92701, 93702, and 30703 were covered.

Safety Issues Management System (SIMS) Items: Item 41, Multiplant Action (MPA) Item B-58, Licensee's Scram Discharge Volume Capacity.

Results: No violations or deviations were identified. One inspector followup item was identified (paragraph 7) which deals with licensee evaluation to determine if environmental qualification requirements are adequately maintained during and following the performance of surveillance procedures.

DETAILS

1. Persons Contacted

Licensee Personnel

*C. M. Powers, Plant Manager
J. W. Baker, Assistant Plant Manager
D. S. Feldman, Plant Quality Assurance Manager
A. G. Hosler, Nuclear Safety Assurance Group Manager
K. D. Cowan, Plant Technical Manager
M. C. Bartlett, Plant QC Supervisor
R. L. Koenigs, Plant Technical Supervisor
R. J. Barbee, Plant Engineering Supervisor
*E. R. Ray, Instrumentation and Controls Supervisor
*S. L. Washington, Lead Compliance Engineer
*W. H. Sawyer, Control Room Supervisor
J. D. Arbuckle, Compliance Engineer

*Denotes those attending the final exit meeting on March 11, 1988.

The inspector also contacted licensee operators, engineers, technicians, and other personnel during the course of the inspection.

2. Inspection To Verify Licensee's Scram Discharge Volume Capability, Safety Issues Management System (SIMS) Item 41

The inspector reviewed the licensee's actions to ensure that the scram discharge volume (SDV) capability was in accordance with long term commitments. These commitments were in response to concerns identified by the NRC in Multiplant Action (MPA) Item B-58. In particular, the licensee was required to improve the hydraulic coupling between the SDV headers and the SDV instrumented volume, to increase the reliability of the float switches in the instrumented volume, and to modify the instrumented volume to prevent damage to the level sensors by hydrodynamic forces and water hammer.

The inspector reviewed the final safety analysis report (FSAR) and Drawing M-528, Revision 45, "Flow Diagram, Control Rod Drive System," to determine the hydraulic coupling between the headers and the instrumented volume. The inspector verified that the design basis for the scram discharge volume was 3.34 gallons per rod drive unit. This was identified as an acceptable means of meeting the sufficient volume criterion established in General Electric letter ER 54 dated March 14, 1972. Drawing M-528 showed that the system was designed with progressively larger piping ((from each hydraulic control unit (HCU) to the instrumented volume)) to minimize flow restriction. The only location where blockage needed to be assumed in the design analysis (piping less than 2 inches in diameter) was the discharge line form the hydraulic control unit since the piping diameter was 3/4 inch. However, blockage here would only cause failure of one control rod to insert. This was determined to be an acceptable consequence for a single failure and was evaluated as part of the design basis.. The

inspector reviewed drawing M-528 to ensure that the SDV vent and drain valves close on a loss of air and toured the control room to verify that there was valve position indication for these valves. The inspector noted that there were two vent and drain valves per HCU, with each valve powered from the two trains of the reactor protective system (RPS). As a result, if the RPS should lose power the valves would fail closed and were protected from a single active failure.

The inspector reviewed the FSAR and drawing M-528, and walked down the accessible portions of the system. The inspector found that the safety-related instrument level taps were on the instrumented volume, as required, and not connected to the attached piping. The inspector noted that there were 6 level instruments per SDV. These consisted of 2 Rosemount level transmitters and 4 Magnetrol float switches. These level instruments were set at three different levels. At the lowest level, one of the float switches would actuate to indicate that the volume was not completely empty during post-scram draining or to indicate that the SDV was starting to fill through leakage accumulation at other times during reactor operation. At the second level, a second float switch would actuate a rod withdrawal block when leakage accumulated to half the capacity of the instrumented volume. The remaining two float switches and the two level transmitters were interconnected with the reactor protection system to give a scram when a high water level existed in the instrumented volume. The high level was set to allow for sufficient volume for a full reactor scram. The inspector noted that there was one instrument tap for every two level instruments. In addition, each instrument had its own manually operated isolation valves. The header piping arrangement was such that there would be a relatively slow filling of the instrumented volume to preclude a water hammer effect on the piping and instrumentation. The inspector considered that using this instrument arrangement allowed for adequate redundancy and diversity.

The inspector reviewed the following surveillance procedures:

- 7.4.1.3.1.4.1, Revision 1, "Scram Discharge Volume Operability Test"
- 7.4.3.1.1.17, Revision 1, "RPS SDV Level Channels B and D Channel Calibration and Channel Functional Test"
- 7.4.3.1.1.16, Revision 1, "RPS SDV Level Channels B and D Channel Calibration and Channel Functional Test"
- 7.4.1.3.1.1, Revision 6, "Scram Discharge Volume Vent and Drain Valves Operability"
- 7.4.3.1.1.61, Revision 7, "RPS-SDV Level Transmitter (Channels A & C) Channel Functional Test"
- 7.4.3.1.1.68, Revision 4, "RPS-SDV Level Transmitter (Channels B & D) Channel Functional Test"
- 7.4.3.1.1.59, Revision 11, "RPS-SDV Level Transmitter (Channels B & D) Calibration"
- 7.4.3.1.1.60, Revision 11, "RPS-SDV Level Transmitter (Channels A & C) Calibration"

The inspector verified that procedures existed to perform surveillances periodically in accordance with the Technical Specification (TS) requirements. The surveillance procedures appeared to be of sufficient detail to adequately test the level alarm and trip instrumentation. They

demonstrated that the scram instrument response and valve function tests were performed at pressure and temperature and at approximately 50% control rod density. The procedures also provided for proper restoration of the system configuration upon completion of testing.

As a result of the inspector's review of the system configuration, the inspector considered that the system was not susceptible to a single failure; that it was designed with adequate volume; that it should be subject to minimal hydrodynamic forces and water hammer; and, that the instrument arrangement allowed for adequate redundancy and diversity.

No violations or deviations were identified.

3. Licensee's Response To NRC Bulletin 85-03, "MOV Common Mode Failures During Plant Transients Due To Improper Switch Settings

The inspector continued a review of the licensee's program for testing of motor operated valves (MOVs) in response to NRC Bulletin 85-03. In particular, the inspector reviewed the Supply System's training program for personnel performing testing using motor operated valve analysis and testing (MOVATS) equipment. In the past, the licensee sent their personnel to MOVATS Inc. for training on the use of the testing equipment. Since the original inspection in this area, the licensee has instituted their own training program.

The inspector reviewed lesson plan 82-ELE-1100-LP, "MOVATS 2100/2150 Field Data Acquisition and Analysis". This training plan was designed to expand upon the MOV actuator training course that was required for all personnel performing MOVATS testing. The lesson plan was constructed to teach personnel how to perform signature acquisition according to the manufacturers' specification and the plant procedure. The inspector found that it provided a review of motor operated valve actuator operation and a detailed description of the theory of operation and the use (including hands-on experience) of MOVATS equipment. The inspector found that the licensee's program for training personnel closely followed the technical content of the Limitorque operator manual and the MOVATS Inc. training manual. Discussions with the licensee indicated that personnel performing MOVATS testing will be trained and tested prior to the next refueling outage at which time additional testing will take place. The inspector considered that the licensee's training program was adequate to train personnel performing MOV testing. Additional inspections will take place during the upcoming refueling outage to ensure that the Supply System's overall program for performing MOV testing is adequate.

No violations or deviations were identified.

4. Licensee Actions On Previous NRC Inspection Findings

a. (Closed) Followup Item (87-11-01), "Determination of Need for MOVATS Equipment to Be Under M&TE Program"

This item identified that the equipment used for the MOV testing program was not controlled under the Measuring and Test Equipment

(M&TE) program. The inspector recommended that the licensee evaluate the need for this equipment to be included as M&TE.

Discussions with the licensee revealed that the MOVATS equipment has been incorporated in the M&TE program. The equipment was sent to MOVATS Inc. for calibration prior to use during the upcoming refueling outage since the Supply System did not have the facilities to perform the calibrations. In addition, this equipment will be recalibrated on a periodic basis. The inspector considered that the licensee's actions were appropriate to control the use of this equipment. Therefore, this item is closed.

b. (Closed) Followup Item (87-21-01), "Review Of Work Performed Under Vital MWR Program"

This concern dealt with the level of detail specified for work on vital maintenance work request (MWR)-1378 and the apparent lack of strict controls for work performed on vital MWRs in general. MWR-1378 was issued to repair the clutch mechanism for the valve operator on main steam leakage control (MSLC) valve 1A. Due to various problems encountered and the lack of strict controls established in the MWR, the motor operator failed on July 20, 1987. The inspector observed the licensee's repair of the operator on MSLC valve 1A several days later. However, long term corrective actions had not been implemented until recently.

During this inspection, the inspector reviewed the licensee's long term corrective action which was to issue Revision 8 to PPM 1.3.7, "Maintenance Work Request". This revision defined additional controls (e.g., additional reviews and more definitive instructions to personnel) for work to be performed on vital MWRs. The inspector considered that the procedure revisions should lessen the potential for error when performing work specified in vital MWRs. Therefore, this item is closed.

c. (Closed) Followup Item (87-21-02), "Review Of Licensee's Configuration Control Program"

This item identified the inspector's concern over the licensee's configuration control program. In particular, jumpers were found missing by the licensee in July, 1987 from 12 of 16 valves in the MSLC system for no apparent reason. These jumpers were specified to be in place by the applicable upper tier drawings for the valves. The inspector noted that similar concerns over the configuration control program were identified in the safety system functional inspection (SSFI) that was conducted in August, 1987. For immediate corrective actions, the licensee performed a walkdown of motor operated valves of which the status of the installed jumpers was indeterminate. Long term corrective actions were not implemented until recently.

For long term corrective action, the licensee issued a revision to PPM 1.4.1, "Plant Modifications". This procedure revision was designed to better integrate the activities of all groups involved in

the modification process. In addition, the new procedure required that the plant system engineer perform a post modification review and/or walkdown of the system modification. This walkdown will be performed with support form the Design Engineering, Maintenance, Operations, and QA/QC as appropriate to assure completion of all required work prior to returning the system to service. The licensee's corrective actions should minimize the potential for future configuration control errors. Therefore, this item is closed.

No violations or deviations were identified.

5. Licensee Event Report (LER) Followup

The inspector reviewed the following LER packages to determine the extent of the licensee's corrective actions. These packages included the proposed modifications which the Supply System intends to implement during the upcoming refueling outage. Based upon the inspector's review of the proposed corrective actions, these LERs are considered closed.

- (Closed) LER 87-17 Revision 0, "RWCU System Isolation Due To Demineralizer Influent Valve Leakage"

- (Closed) LER 88-02 Revision 0, "Part 21 Report Dealing With Potential For An Unmonitored Release Path Through Reactor Core Isolation Cooling System Piping"

No violations or deviations were identified.

6. Plant Tour

The inspector conducted a tour of the reactor building on March 8, 1988 to assess the licensee's housekeeping activities. In general, the building cleanliness was adequate. However, the inspector identified a discrepancy as identified below.

The inspector found that the bolts had been loosened and the cover was open for terminal box TB-IR-68-2 Division 2 on the 548 foot elevation of the reactor building. The inspector noted that a sticker had been attached to the front cover of the box identifying that it was under PPM 10.1.21, "Maintenance of Environmentally Qualified Equipment," control. The inspector questioned the licensee as to why this box cover had been left open and reviewed procedure PPM 10.1.21 to determine environmental qualification (EQ) requirements for terminal boxes.

The inspector discussed this item with the licensee who identified that the operators entered TB-IR-68-2 and other terminal boxes the previous day to perform Surveillance Procedure 7.0.0, "Shift and Daily Instrument Checks (Modes 1, 2, 3)." In the case of TB-IR-68-2, the operators were required to check the cam position for the containment inerting system timer.

The inspector reviewed PPM 10.1.21 and found that step 10.1.21.7.B.6 specified that EQ equipment that was covered by the Technical Specifications (TS) surveillance program shall have the special

requirements for the equipment specified in the surveillance procedure. However, the inspector found no EQ requirements specified in surveillance procedure 7.0.0. Discussions with cognizant licensee personnel indicated that terminal box TB-IR-68-2 was a spray tight enclosure only. The EQ requirements were intended for the seals used on conduit that penetrate the bottom of this box. These seals must be reinstalled after completion of work to ensure that water does not flow through the conduit to the electrical component at the end of the conduit run.

For immediate corrective action, the Instrumentation and Control technicians closed the cover and tightened the bolts for TB-IR-68-2. In addition, technicians inspected other boxes to ensure that they were properly closed. Although the case of TB-IR-68-2 did not appear to be of any safety significance, the inspector expressed concern to the Supply System management that there may be surveillance procedures that should have EQ requirements specified in them but do not. The licensee management stated that they would take steps to ensure that EQ requirements were met when performing surveillance procedures. The licensee's actions on this matter will be reviewed in the future and is identified as inspector followup item (397/88-09-01).

No violations or deviations were identified.

7. On-Site Review of Events

On March 9, 1988, the Supply System identified to the NRC the possible desire for a temporary waiver to TS 3.8.2.1 since they could not meet the surveillance requirement limits specified in Table 4.8.2.1-1. In particular, 24VDC battery BO-1B had a pilot cell specific gravity below the 1.200 Category "A" limit and an overall battery average specific gravity of 1.190 which was below the 1.205 Category "B" limit. However, at no time was the TS allowable value exceeded. The reason for the low specific gravity on this battery was determined to be stratification as a result of the discharge that took place the previous week while performing breaker testing. At that time, the power supply for the battery charger was removed from service and battery BO-1B had to act as the power supply for various DC equipment. The licensee contacted the vendor to determine if any corrective actions could be taken for the low gravities experienced in each of the jars for battery BO-1B.

The result of the discussion with the vendor led the licensee to take specific gravities at various heights in each of the battery jars and then average the values (in each jar) to determine its actual specific gravity. The results of the measurements indicated that the specific gravity for the pilot cell and the average specific gravity for the battery was significantly higher than the Category "A" and "B" limits. As a result, the Supply System contacted the NRC to specify that the need for a temporary TS waiver was not necessary.

The major concern with the electrolyte stratification was identified to be an accelerated degradation of the battery jars thereby reducing their expected lifetime. As a result of this concern, the Supply System began an evaluation to determine the best method for reducing stratification.

The inspector will monitor the licensee's progress in this during future inspection efforts.

No violations or deviations were identified.

8. Exit Meeting

On March 11, 1987, an exit meeting was held with the licensee representatives identified in paragraph 1. The inspector summarized the inspection scope and findings as described in this report.