U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-397/85-34

Docket No. 50-397

License No. NPF-21

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

Facility Name: WNP-2

Inspection at: WNP-2, Benton County, Washington

Inspection conducted: September 9-13, 1985

Inspectors: Talbert Young Jr. for 9-30-85
K. D. Ivey, Jr., Reactor Inspector Date Signed

Contractors: R. White, Project Manager
Nuclear System Safety Program, LLNL

W. Wade, Project Manager
Mechanical Engineering Department, EG&E, San Ramon

Approved By: Talbert Young Jr. 9-30-85
T. Young, Jr., Chief, Engineering Section Date Signed

Summary:

Inspection during the period of September 9-13, 1985 (Report No. 50-397/85-34)

Areas Inspected: An unannounced, safety inspection by an NRC regional based inspector and two NRC consultants for the follow-up of Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem ATWS Events", and TI 2515/64 Rev. 1, "Near-Term Inspection Followup to Generic Letter 83-28".

The inspection involved 31.5 hours by one NRC inspector and 63 hours by two NRC consultants on module Nos. 30703, 92704B, and 25564B.

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

*C. M. Powers, Plant Manager
E. R. Ray, Maintenance Engineer
F. L. Walton, Principle Maintenance Engineer
D. L. Anderson, Mechanical Supervisor
*S. Davison, Compliance Engineer

*Denotes those individuals attending the exit interview on September 13, 1985.

In addition, Mr. R. Waite (NRC Resident Inspector) attended the exit interview.

2. Background

In February 1983, during startup of the Salem Nuclear Power Station Unit 1, the Westinghouse Type DB-50 reactor trip system (RTS) circuit breakers twice failed to open automatically upon receipt of a valid trip signal. The failure to trip was attributed to a binding within the undervoltage trip attachment (UVTA) located inside the breaker cubicle. Due to the failures at Salem and similar failures at other plants, and as a result of its investigations and reviews of the failures, the NRC Office of Nuclear Reactor Regulation issued Generic Letter (GL) 83-28 to all licensees and applicants on July 8, 1983. This letter required all affected utilities to furnish the status of current conformance to the Generic Letter and their plans and schedules for any needed improvements. Four of the items in GL 83-28 are identified for Region-Based post-implementation review. They are:

- Item 3.1 Post-Maintenance Testing (Reactor Trip System Components)

- Item 3.2 Post-Maintenance Testing (All Other Safety-Related Components)

The inspection is to address the adequacy and completeness of the Post-Maintenance Testing (including modifications) of safety-related components.

- Item 4.1 Reactor Trip System Reliability (Vendor Related Modifications)

- Item 4.5.1 Reactor Trip System Reliability (System Functional Testing)

The inspection is to ensure that vendor-recommended modifications and RTS changes are completed in PWRs and that on-line functional testing of the RTS diverse trip features is performed on all LWRs.

NOTE: Item 4.1 is not applicable to BWRs.

On February 2, 1984, the NRC Office of Inspection and Enforcement issued Temporary Instruction (TI) 2515/64, "Near-Term Inspection Followup to Generic Letter 83-28", for Region-Based inspection to identify immediate licensee actions to various items in GL 83-28 and associated licensee programs that were in place. Revision 1 to the TI was subsequently issued April 4, 1985. Items from the TI to be inspected by the regions are identified as follows:

- Equipment Classification (Response to Items 2.1 and 2.2.1 of GL 83-28)
- Vendor Interface (Response to Items 2.1 and 2.2.2 of GL 83-28)
- Post Maintenance Testing (Response to Items 3.1 and 3.2 of GL 83-28)
- RTS Reliability (Response to Items 4.2 and 4.5.1 of GL 83-28)

3. General

The licensee's initial response to GL 83-28 was submitted by letter on November 18, 1983.

WNP-2 utilizes the General Electric Reactor Trip System (RTS) Design which operates on a one-out-of-two twice trip logic. In the design there are two sub-channels -- both of which are required to trip in order to produce a reactor trip. Each of the sub-channels has two inputs and either one can cause the sub-channel to trip.

Reactor Trip Breakers are not used in this design. Instead, a sub-channel trip actuates one of two sets of 185 pilot solenoid valves associated with the control rod drive units (Note: Two pilot solenoid valves are provided for each drive unit. These are divided into two sets -- one for each logic sub-channel -- and both sets must be actuated to produce a reactor trip).

The pilot solenoid valves exhaust air from air operated valves which control water flow in the control rod drive units. With a loss of air, these valves automatically move to the scram position. A redundant means for exhausting air from the air-operated valves is provided by "scram backup solenoid valves". Two such valves are connected in parallel to the header which supplies air to the pilot solenoid valves. When either of these two valves opens, air is exhausted from the pilot solenoid valve air supply header and a reactor trip is initiated. The pilot solenoid valves de-energize to cause a trip and the scram backup solenoid valves energize to cause a trip.

4. Items 3.1.1, 3.1.2, 3.2.1, and 3.2.2 Post-Maintenance Testing

The inspectors reviewed the licensee's responses to Generic Letter 83-28 which described their program for post-maintenance testing. The licensee stated in the responses that they had reviewed their procedures for post-maintenance testing of safety-related components. The licensee further stated that such testing is designed to demonstrate that safety-related components are capable of performing their intended safety

functions following maintenance activit es and described the relevant procedures for controlling maintenance and post-maintenance testing.

The document that is used to control maintenance activities is the Maintenance Work Request (MWR). Administrative Procedure 1.3.7, "Maintenance Work Request", requires preparation of an Operability Check Sheet when maintenance is necessary on a safety-related system or component. This sheet references the operability test to be conducted following the maintenance activity. A sign-off block is also provided on the sheet which is initialed and dated upon completion of the test to indicate that all of the work has been done. The check sheet also identifies specific instructions and procedures which list the tests to be conducted following maintenance activities on safety-related components.

The inspectors reviewed the licensee's administrative, quality assurance/quality control (QA/QC), and maintenance procedures and several specific nuclear operation standards (NOSs) to confirm that the licensee's program provides adequate post-maintenance testing and that the procedures are consistent with those stated in the licensee's response to the generic letter. The inspectors confirmed that the licensee's program for post-maintenance testing includes documents related to maintenance which describe or reference the testing necessary prior to returning safety-related systems or components to an operable status. The inspectors also confirmed that these documents require a signature indicating satisfactory completion of post-maintenance testing before they are filed as safety-related records. The licensee's program also provides criteria for the review and approval of maintenance and subsequent testing, and the responsibilities for such activities are delineated in approved procedures. In addition, criteria exist for inspection and data verification of the testing by QA, QC, maintenance, engineering, or other knowledgeable personnel; these responsibilities are also delineated in the licensee's program.

The inspectors determined that the licensee's program includes the administrative controls necessary to prepare, document, review, and approve the results of post-maintenance testing, as well as procedures and controls for retaining safety-related records in a storage facility.

The inspectors reviewed the following MWRs for implementation of the licensee's program:

MWR	Equipment Piece No.	Date
AV0023	RHR MO 47A	May 7, 1985
AV0321	RHR V 17B	September 11, 1985
AU0608	RHR V 16A/17A	June 7, 1985
AX4122	RHR V 42B	April 12, 1985
AV0251	FP SYS 1	July 23, 1985
AX4065	FP PLV 65	March 20, 1985
AW7410	RPS RLY K14A-H	March 15, 1985
AU0438	RPS PS 4	May 24, 1985

The inspectors had the following findings concerning some of the MWRs; all others had no discrepancies.

- Vital MWR AV0023 was written to troubleshoot and repair a motor-operated valve (RHR-MO-47A) that was blowing fuses at the motor controller. Post-maintenance testing was specified on this MWR under "operation test required." The inspectors noted that a vendor's manual was referenced for the work done on this MWR rather than established maintenance procedures. The licensee stated that this was due to the urgency of completing the vital MWR. The inspectors also noted that the testing required by the vendor's manual was not as extensive as that required by the plant maintenance procedures.

- Vital MWR AV0321 was written to troubleshoot a valve. The inspectors noted that the torque setting requested for this valve on the MWR was not achieved and that the setting was left as originally found. The MWR contained no explanation as to why this had occurred or what work was done on the valve. The licensee stated that the MWR was reviewed by plant management and was being updated to show the extent of the work performed.

Vital MWRs are used when it is necessary to:

a. minimize injury to personnel or damage to the plant,

b. protect the health and safety of the public, or

c. maintain an essential system's or component's operability

The inspectors noted that lenient procedures and work practices for vital MWRs increase the likelihood that inadequate post-maintenance testing may occur and insufficient work records may exist. The licensee stated, in the exit interview, that plant management has concerns about the uses of vital MWRs and they are presently looking at and following the progress of them with reviews in their morning management meeting.

The inspectors also reviewed the licensee's response describing their program for vendor interface and control of vendor technical information. In their response, the licensee stated that vendor information is used to prepare specific plant procedures, but that other sources (including plant experience, equipment history, and external sources of information) are combined with this vendor information to prepare plant procedures.

The inspectors held discussions with site personnel and reviewed procedures and other documents to confirm that the procedures in use were consistent with the licensee submittal, as well as to ensure that the licensee had established and implemented a continuing program to assure that all vendor information being used was correct, current, and controlled.

The inspectors reviewed the technical manuals for motor-operated valves and compared them with plant procedures. Because additional information is provided in the plant procedures, the vendor manuals differed from

them; however, the inspectors found that the plant procedures contained more detailed post-maintenance test procedures for the items reviewed. The comparison also showed that the plant maintenance procedures include equivalent, or better, test requirements than the vendor's manuals.

Based on the results of the review, as outlined above, the inspectors found that the licensee's post-maintenance testing and vendor manual control programs satisfy parts 3.1.1, 3.1.2, 3.2.1, and 3.2.2 of Generic Letter 83-28.

No violations or deviations were identified.

5. Item 4.5.1 RTS Reliability (System Functional Testing)

On-line testing of the Reactor Trip System can be performed without concern about shutting down the reactor by producing a so-called "half-scram". As detailed in paragraph 3, both sub-channels are required to trip in order to produce a reactor trip. Tripping only one sub-channel produces a "half-scram" which tests all of the components in the circuit for that sub-channel from the input sensor to the actuated device.

In their responses, the licensee stated that functional testing was performed in conjunction with weekly testing on the Intermediate Range Monitors (IRMs) and Average Power Range Monitors (APRMs) and monthly tests for other RPS process variables. This testing is required per Technical Specification 4.3.1. The inspectors reviewed test procedures and completed test results in the licensee's document files and concluded that the licensee is fulfilling the requirements for testing of the scram pilot valves.

The licensee does not provide on-line functional testing of the scram backup valves and has justified this action by stating that both channels of the reactor trip logic must be tripped (full scram) in order to test the valves. If either scram backup valve opens, the reactor is shutdown. The licensee, however, states that surveillance testing on the scram backup valves is performed at cold shutdown. This testing includes the RPS circuit (manual trip) to actual verification of air vent bleed off at the backup scram valve. Per a memorandum dated November 16, 1984 (NRC Division of Systems Integration to NRC Division of Licensing), the NRC concluded that justification has been provided to not require modification of the backup scram to provide on-line testability for GE RTS designs. The inspectors reviewed the surveillance test procedure and completed test results for the backup scram valves and concluded that the licensee has been performing the tests as stated in their response to GL 83-28.

No violations or deviations were identified.

6. TI 2515/64 Rev. 1 (Closed), "Near-Term Inspection Followup to Generic Letter 83-28"

This TI was written to provide near-term followup on the licensee's response to GL 83-28 in the areas of equipment classification, vendor

interface, post-maintenance testing, and RTS reliability. Post-maintenance testing and RTS reliability are documented elsewhere in this report. The emphasis of the inspection is on immediate actions taken by the licensee in response to GL 83-28 and on licensee programs that are in place.

The inspectors held discussions with licensee personnel and reviewed associated procedures and correspondence to obtain the following findings:

a. Equipment Classification

The criteria for identifying systems, and components within the systems, as safety-related are found in Section 3.2.2 of the WNP-2 Final Safety Analysis Report (FSAR). The following three categories are used:

- Quality Class I

  Any nuclear safety structure, subassembly, component or design characteristic that prevents or mitigates the consequences of postulated accidents that could cause undue risk to the health and safety of the public. All engineered safeguards fall within this category. All Quality Class I items meet the applicable provisions of 10 CFR Part 50 Appendix B.

- Quality Class II

  Any system, structure, subassembly, component or design characteristic which, as a result of being defective, could cause a safety hazard to plant personnel, an extended reduction in unit output, an unscheduled unit trip, or equipment damage.

- Quality Class G

  Any non-nuclear system, structure, subassembly, component, or design characteristic in which Quality Assurance requirements are assigned in accordance with their consequences of failure, operating costs or procurement costs.

Administrative Procedure 1.3.22, "Quality Classifications for Plant Related Systems, Components, Items or Specifications", establishes the method for determining the quality classification of a system or component. There are several sources of information which can be used to establish Quality Class for Items:

- The FSAR Section 3.2
- WNP-2 Class 1E and Safety-Related Mechanical Lists
- The GE Master Parts List
- Original Procurement Specifications

Whenever the quality Class of an Item cannot be clearly established from these sources an Engineering Evaluation must be performed to determine the Quality Class.

The licensee maintains a computerized equipment list known as the Master Equipment List (MEL) which is a tabulation of all components identified by an Equipment Piece Number (EPN). This is the Component Level Q-List. The MEL is also the source of component data for other data bases such as Scheduled Maintenance System (SMS), Maintenance Work Request (MWR), Class 1E (C1E), Nuclear Plant Reliability Data System (NPRDS), and Materials Management Information System (MMIS). Plant personnel utilize the MEL when initiating MWRs, ordering parts, performing surveillance and making design changes.

The inspectors reviewed the MWRs noted in paragraph 4 for equipment classification and noted one discrepancy; detailed below:

- MWRs AV0321 and AU0608 were issued for work on the same valves in a safety-related system. MWR AV0321 correctly identified the valves as safety-related; MWR AU0608 did not. The significance of this finding is that: (1) the system used to establish safety-related status may be inadequte and/or (2) an inadequate level of maintenance might be performed on safety-related equipment. The inspectors noted that the program is adequate to ensure that equipment classification is performed correctly and therefore considered this incident to be an isolated case, noting that MWR AU0608 had been voided before any work was started on the valve.

The licensee stated, in the exit interview, that MWR accuracy was a concern of the plant management. Also, the surveillance organization was reviewing MWRs for completeness and accuracy to determine if action is necessary to increase the reliability of the information on MWRs.

b. Vendor Interface

The licensee has established, implemented and is maintaining a Contractor/Vendor Information (CVI) file system to ensure that vendor information received for safety-related components is controlled and available for use throughout the life of the plant. The MEL provides direct reference to a CVI file item which contains pertinent engineering, test, or maintenance information that was obtained during procurement or construction. Typically, this information is contained in what is called an Operating and Maintenance (O&M) Manual.

Plant Procedure 1.6.3, "Vendors' Operating and Maintenance Manuals", establishes a uniform method for reviewing and controlling O&M manuals and revisions thereto. The manuals are stored in the Operations File which serves as the licensees' vendor library. New manuals and changes or revisions to existing manuals are processed by completing a Vendor Manual Review Control Form which is reviewed to determine applicability to plant systems.

The licensee is also an active member of the INPO Nuclear Utility Task Action Committee (NUTAC) on vendor interface. Based on NUTAC's

final draft report, the licensees' program is meeting or exceeding NUTAC's guidance.

The inspectors reviewed vendor manuals in the Operations File (also see paragraph 4) and determined that the program was being implemented in accordance with procedures.

No violations or deviations were identified.

7. Exit Interview

On September 13, 1985, an exit interview was held with the licensee representatives identified in paragraph 1. The inspectors summarized the scope and findings of the inspection as noted in this report.