

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-344/85-13

Docket No. 50-344

License No. NPF-1

Licensee: Portland General Electric Company
121 S. W. Salmon Street
Portland, Oregon 97204

Facility Name: Trojan

Inspection at: Rainier, Oregon

Inspection conducted: April 2 - May 13, 1985

Inspectors: R T Dodds 5/28/85
S. A. Richards Date Signed
Senior Resident Inspector

R T Dodds 5/28/85
G. C. Kellund Date Signed
Resident Inspector

Approved By: R T Dodds 5/28/85
R. T. Dodds, Chief Date Signed
Reactor Projects Section 1

Summary:

Inspection on April 2 - May 13, 1985 (Report 50-344/85-13)

Areas Inspected: Routine inspection of operational safety verification, corrective action, maintenance, surveillance, followup on previous inspection items, review of refueling activities, and inspection of various aspects of plant operation. The inspection involved 266 inspector-hours by the NRC Resident Inspectors.

Results: No violations of NRC requirements were identified.

DETAILS

1. Persons Contacted

*W.S. Orser, Plant General Manager
R.P. Schmitt, Manager, Operations and Maintenance
D.R. Keuter, Manager, Technical Services
J.D. Reid, Manager, Plant Services
R.E. Susee, Operations Supervisor
D.W. Swan, Maintenance Supervisor
A.S. Cohlmeier, Engineering Supervisor
G.L. Rich, Chemistry Supervisor
T.O. Meek, Radiation Protection Supervisor
S.B. Nichols, Training Supervisor
D.L. Bennett, Control and Electrical Supervisor
P.A. Morton, Quality Assurance Supervisor
R.W. Ritschard, Security Supervisor
H.E. Rosenbach, Material Control Supervisor
J.K. Aldersebaes, Manager, Nuclear Maint. and Construction

The inspectors also interviewed and talked with other licensee employees during the course of the inspection. These included shift supervisors, reactor and auxiliary operators, maintenance personnel, plant technicians and engineers, and quality assurance personnel.

*Denotes those attending the exit interview.

2. Operational Safety Verification

During this inspection period, the inspectors observed and examined activities to verify the operational safety of the licensee's facility. The observations and examinations of those activities were conducted on a daily, weekly, or biweekly basis.

On a daily basis, the inspectors observed control room activities to verify the licensee's adherence to limiting conditions for operations as prescribed in the facility technical specifications. Logs, instrumentation, recorder traces, and other operational records were examined to obtain information on plant conditions, trends, and compliance with regulations. The inspectors noted that the control operator's logs often lacked sufficient detail to adequately describe the events of the shift. The logs occasionally omitted information pertinent to the facility operation or were not clear about equipment status or operability. The inspectors discussed this situation with the Operations Supervisor and stressed the importance of the logs in maintaining adequate communications regarding plant status, significant trends or unusual conditions. He stated that he was aware of the problem and had initiated action to improve the logs. The inspectors subsequently identified some improvement in the logs, but noted that further improvement is warranted. Licensee representatives stated that this effort would be a continuing one. The Inspectors will follow this item

during subsequent inspections. On occasions when a shift turnover was in progress, the turnover of information on plant status was observed to determine that all pertinent information was relayed to the oncoming shift.

During each week, the inspectors toured the accessible areas of the facility to observe the following items:

- a. General plant and equipment conditions.
- b. Maintenance requests and repairs.
- c. Fire hazards and fire fighting equipment.
- d. Ignition sources and flammable material control.
- e. Conduct of activities in accordance with the licensee's administrative controls and approved procedures.
- f. Interiors of electrical and control panels.
- g. Implementation of the licensee's physical security plan.
- h. Radiation protection controls.
- i. Plant housekeeping and cleanliness.
- j. Radioactive waste systems.

The licensee's equipment clearance control was examined weekly by the inspectors to determine that the licensee complied with technical specification limiting conditions for operation with respect to removal of equipment from service. Active clearances were spot-checked to ensure that their issuance was consistent with plant status and maintenance evolutions.

During each week, the inspectors conversed with operators in the control room, and with other plant personnel. The discussions centered on pertinent topics relating to general plant conditions, procedures, security, training, and other topics aligned with the work activities involved.

The inspectors examined the licensee's nonconformance reports (NCR) to confirm that deficiencies were identified and tracked by the system. Identified nonconformances were being tracked and followed to the completion of corrective action. NCRs reviewed during this inspection period included 85-012, 85-018, and 85-020.

Logs of jumpers, bypasses, caution, and test tags were examined by the inspectors. Implementation of radiation protection controls was verified by observing portions of area surveys being performed, when possible, and by examining radiation work permits currently in effect to see that prescribed clothing and instrumentation were available and used. Radiation protection instruments were also examined to verify operability and calibration status.

The inspectors verified the operability of selected engineered safety features. This was done by direct visual verification of the correct position of valves, availability of power, cooling water supply, system integrity and general condition of equipment, as applicable. ESF systems verified operable during this inspection period included the containment spray system, the auxiliary feedwater system, and the 'B' train of the 125 VDC electric system.

No violations or deviations were identified.

3. Corrective Action

The inspectors examined facility records to verify that quality related deficiencies were identified and reported to cognizant management for resolution. Records examined by the inspectors included Requests for Evaluation, Possible Reportable Occurrences, Plant Review Board meeting minutes, and Quality Assurance Program Nonconformance Reports and Quality Notice log books. Plant Review Board meetings were attended by the inspectors on April 11 and May 9.

No violations or deviations were identified.

4. Maintenance

Maintenance activities involving preventive and corrective maintenance were observed by the inspectors during the inspection period. On a selective basis, observations by the inspectors verified that proper approvals, system clearances, and required prerequisites were performed, as appropriate, prior to maintenance on safety-related systems or components. The inspectors verified that qualified personnel performed the maintenance using appropriate maintenance procedures. When possible, replacement parts were examined to determine the proper certification of materials, workmanship and tests. During the actual performance of the maintenance activity, the inspectors checked for proper radiological controls and housekeeping, as appropriate. Upon completion of the maintenance activity, the inspectors verified when possible, that the component or system was properly tested prior to returning the system or component to service. During the inspection period, maintenance activities observed were associated with annual preventative maintenance on the emergency diesel generators and maintenance inspection of the diesel driven auxiliary feedwater pump. The licensee noted that on the diesel auxiliary feedwater pump, the coupling of the lube oil pump on the speed increaser between the diesel engine and the AFW pump has a potential deficiency. The speed increaser lube oil pump is attached to the speed increaser by a coupling that is held together by a key/keyway mechanism. The keyway was observed to be machined to an excessive length which could allow the key to back out and disengage the coupling. This situation has also been found to exist on the speed increasers of both centrifugal charging pumps. In the case of one of the charging pumps, the key had partially backed out of the keyway. The licensee has resolved this situation by distorting the keyway and thereby blocking the key in place. In addition, the licensee is evaluating this issue for reportability under 10 CFR 21.

No violations or deviations were identified.

5. Surveillance

The surveillance testing of safety-related systems was witnessed by the inspectors. Observations by the inspectors included verification that proper procedures were used, test instrumentation was calibrated and that the system or component being tested was properly removed from service if

required by the test procedure. Following completion of the surveillance tests, the inspectors verified that the test results met the acceptance criteria of the technical specifications and were reviewed by cognizant licensee personnel. The inspectors also verified that corrective action was initiated, if required, to determine the cause for any unacceptable test results and to restore the system or component to an operable status consistent with the technical specification requirements. Surveillance tests witnessed during the inspection period were associated with local leak rate testing of electrical and mechanical penetrations, main steam safety valve testing, station battery operability verification, and control rod operability verification.

No violations or deviations were identified.

6. Followup On Previous Inspection Items

Violation 84-06-01 (Closed): Safety related auxiliary feedwater (AFW) pumps inoperable due to surveillance and maintenance activities. The licensee has revised two administrative orders to more adequately ensure that safety related equipment operability is fully considered when performing surveillance and maintenance activities. The inspectors discussed the procedural changes with Instrumentation and Control (I&C) personnel and suggested that a precaution statement added to I&C procedure PICT 10-1 concerning equipment operability would be appropriate. PICT 10-1 tests the solid state protection system and in doing so renders the majority of safety related equipment associated with its train inoperable. The licensee agreed to consider revising the procedure.

Violation 84-29-01 (Closed): Emergency Diesel Generator (EDG) high crankcase pressure trip not defeated on an automatic start. The inspector reviewed request for design change (RDC)-053, design change package (DCP)-2. This RDC removed the crankcase pressure trip from the EDG control circuit during an automatic start of the EDG. The trip remains functional during a manual start. The inspectors noted no discrepancies with this design change.

Violation 85-04-01 (Closed): Failure to determine response times of auxiliary relays. The licensee response time tested the relays in question and found that the total channel response time was still within the technical specification limits. The I&C procedure governing response time testing has been revised to incorporate the testing of these relays.

Licensee Event Report (LER) 83-06 (Closed): Main steam nonreturn check valve failure to close. During the 1984 refueling outage, the licensee modified the stem packing of the check valves and the check valve counter-weights. These modifications were made to ensure that the valves would close under the force of gravity. The licensee also revised periodic operating test 14-1 to include a procedure for verifying the operability of the check valves. These valves have since performed satisfactorily, therefore, this LER is closed.

LER 84-19 (Closed): Emergency Diesel Generator (EDG) automatic start due to loss of the H1 bus. This event was due to an error by a meter and relay technician who was working in the switchyard. The meter and relay personnel are not assigned to the site and have previously coordinated their activities through the I&C work group. The licensee has transferred the coordination responsibility to the electrical work group. Discussions with the electrical supervisor indicate that the site electricians are knowledgeable in the operation of the site switchyard and therefore, are more qualified to supervise work performed by the meter and relay technicians.

LER 85-02 (Closed): Turbine trip causes reactor trip and heater drain piping failure. The circumstances surrounding this event were described in paragraph 8 of Inspection Report 85-10. All safety systems functioned as designed during the event. To preclude spurious main turbine vibration trips, the licensee is installing a time delay feature in the trip circuitry.

Special Report - Cable Spreading Room Fire Detection System Failure (Closed): As reported by the licensee, the fire detection system for the cable spreading room had proved to be unreliable. The licensee has replaced the old system with what is considered to be a simpler, more reliable system. The new system is now in fully automatic operation.

7. Refueling Outage Activities

Prior to the unit shutdown for the annual refueling outage, the inspectors reviewed the licensee's refueling outage schedule and examined procedures pertaining to the following areas:

FHP-5-1	Refueling Organization
FHP-5-2	Refueling Procedure
FHP-5-3	Reactor Vessel Head Removal and Installation
FHP-5-13	Fuel Shuffle and Position Verification
FHP-5-15	Reactor Vessel Lower Internals Removal and Installation
FHP-13	Fuel Handling Emergency Procedures

The plant commenced the annual refueling outage on May 2, 1985. The shutdown was accomplished in conjunction with a special test associated with maintaining steam generator levels during low power operation. The inspectors witnessed both the shutdown and the test. Various activities associated with preparing for fuel movement were also observed during the course of the inspection.

The major activities being conducted during the outage include the 10-year inservice inspection of the reactor vessel, steam generator sludge lancing and eddy current testing, hydrostatic testing of containment penetrations and replacement of several feedwater heater tube bundles. The licensee's present schedule calls for power operation to commence on July 9, 1985.

No violations or deviations were identified.

8. Evaluation of the Licensee's Response to Selected Safety Issues

The inspectors reviewed the licensee's actions to safety issues which were brought to the licensee's attention by offsite industry information systems. The first issue concerns the potential for backleakage of hot feedwater to disable the auxiliary feedwater (AFW) pumps due to steam binding in the pump casing. This problem has occurred at several plants and is described in IE Information Notice 84-06 and in INPO Significant Operating Experience Report 84-3. The inspectors examined the licensee's proposed measures to address this issue, including possible procedure changes, installation of temperature indication on the AFW pump discharge piping and training on this item for operations personnel. The inspectors noted that the licensee had not yet implemented any method of monitoring the discharge piping temperature on a regular basis, although information concerning this issue has been available approximately one year. The inspectors discussed this point with licensee representatives and stated that while the need for facility modifications is being considered, other means of monitoring the AFW pump discharge piping that do not require hardware changes could have been easily employed as an interim response to the issue. Plant management noted that recent changes in the licensee's system for handling information received from outside sources should provide for more rapid action. The inspectors will further review this area during future inspections.

The second issue concerns the possibility of fuel damage resulting from control rod mispositioning. This problem is described in detail in IE Information Notice 83-75 and in INPO Significant Operating Experience Report 84-2. The inspectors reviewed the licensee's procedures addressing recovery from a mispositioned rod and for verifying rod position when one form of normal indication is lost. In addition, the inspectors reviewed the training provided to operators on this subject. The procedures and training appeared adequate to prevent operation with a misaligned rod and to recover from such an event if it were to occur.

No violations or deviations were identified.

9. Shift Manning Requirements

Paragraph 6.2.2 of the facility technical specifications defines the minimum shift composition required to be on site. The requirements address both licensed and non-licensed operators, the shift technical advisor, and fire brigade members. With the plant operating at power, the inspectors observed that the licensee was rotating personnel on and off the watchbill to allow operators qualified as fire brigade members to leave the protected area of the plant and receive a fire brigade physical examination at the licensee's training complex. The inspectors questioned whether the technical specifications requirements for shift manning were being fully met with shift personnel being sent for the examinations. Discussions with the acting Operations Supervisor indicated that the licensee considered personnel receiving physical examinations at the training facility as being available for meeting minimum manning requirements because the training facility is located on site, a short distance from the entrance of the protected area.

Although the technical specifications are not clear in defining where shift personnel may go when assigned shift responsibilities or what activities they may engage in, the inspectors were of the opinion that personnel assigned shift duties should only perform those functions normally associated with their watchstation. After further discussions with the acting operations supervisor and the acting manager of operations and maintenance, the licensee agreed to follow the inspector's interpretation until upper level management could consider the issue.

At the conclusion of the inspection period, the inspectors discussed this issue with the plant general manager. He stated that after consideration of how management desired watchstanding duties to be viewed by facility personnel, management decided to concur with the inspectors' views on this issue on a permanent basis. The inspectors noted that direction to this effect had been placed in the operations night orders.

No violations or deviations were identified.

10. Residual Heat Removal Pump Performance

The inspectors' attention was drawn to the performance of the residual heat removal (RHR) pumps. These pumps are safety related and provide low head high volume safety injection flow during accident conditions. The technical specifications require that these pumps periodically be tested to ascertain operability by inservice testing (IST) as described by section XI of the ASME boiler and pressure vessel code. Discussions with licensee engineering personnel indicate that RHR pump performance has degraded gradually from the original performance curves determined by the pump manufacturer. The licensee has monitored the testing results and has determined that the existing pump performance is acceptable. The licensee is reluctant to overhaul these pumps unnecessarily due to the elevated radiation levels in the pump vicinity.

The inspectors reviewed the pump curves associated with the RHR pumps and noted that the licensee has drawn a "critical" curve to indicate the minimum allowable performance. The inspectors questioned the conservatism of the licensee's determination. The critical curve appears to be based on data from table 6.3-17 from chapter 6 of the Final Safety Analysis Report (FSAR). It was not clear to the inspectors that the data used was properly applied. The licensee used 223 feet of head and 4188 gpm as a reference for their critical point, however, table 6.3-13 lists design flow as the minimum assumed performance for analysis. Design flow for the RHR pumps is 4500 gpm at 300 feet of head. In addition, paragraph 6.3.3.2.1 of the FSAR discusses conservatisms assumed when considering the ability of emergency core cooling systems to perform their intended function. This margin appears to have been eliminated when using the minimum acceptable performance curve derived by the licensee.

At the close of the inspection, the licensee did not have all the background information available which was used in determining the minimum pump performance. The inspectors felt that the present pump performance appeared acceptable, however, the point of acceptable performance needed to be reconsidered or further justified. The licensee

agreed to review their considerations in this area. This is an unresolved item (85-13-01).

11. Station Battery Loading

The inspectors reviewed the loads off the 125 VDC station vital batteries, with particular emphasis on loads which have been added since initial plant operation. The inspectors noted that numerous non-safety loads had been added over the past nine years, several of which are of significant size, such as heat tracing. The inspectors questioned whether the total load on each battery was being properly tracked to ensure that the total loading remained less than the load assumed in the FSAR. Several design change packages were reviewed which had added loads to the batteries, however, the evaluation accompanying each package did not address what effect the additional load would have on the total battery loading.

The inspectors discussed their concerns with a corporate engineer knowledgeable in this area. This discussion indicated that a review of the total loading on the batteries had recently been conducted by the licensee due to concerns arising from the possibility of adding a new security system to a battery bus. The results of this review proved the total loading to still be less than the load assumed in the FSAR. The engineer did acknowledge that a formal method for tracking total load has not existed in the past, however, he stated that the licensee is presently pursuing developing a load list to continuously monitor the total load on the batteries.

At the close of the inspection period, the inspectors discussed this item with the plant general manager and emphasized the importance of deliberately ensuring the total operability of vital equipment such as the station batteries.

No violations or deviations were identified.

12. Miscellaneous Observations

During a control room tour, the inspectors noticed that the status lights for the reactor trip breakers and bypass breakers were mislabeled. The 'B' train reactor trip breaker and the 'A' train bypass breaker labels had been reversed. The licensee has been conducting a complete labeling of the control room panels during the past few weeks, and the inspectors discussed this effort with licensee representatives and noted the possibility of additional labeling errors. Licensee representatives indicated that a complete map of the control room panels was made prior to the relabeling and that this would be used to verify the correct labeling at the completion of the work. The inspectors will follow this activity during future inspections.

The inspectors observed portions of the training conducted on a mock-up of the incore instrumentation seal table. The mock-up was constructed to train personnel on the work associated with the seal table modifications that are being conducted during the outage. Members of the crew were observed making several useful comments and recommendations of methods to

improve the quality of the work and to reduce personnel radiation exposures. The mock-up of the seal table appeared to be a useful means of improving the quality of work on this task and was being well utilized by the licensee.

During routine plant tours, the inspectors noted that several pipe hangers were deficient. The component cooling water system, safety injection system, and the diesel fuel oil transfer system each had one hanger whose condition was not as described by the facility drawings, i.e. in two instances anchor bolts were missing and in the other a wire had been attached to the support and pipe. These discrepancies were reported to the licensee's site quality assurance organization for correction. The results of the licensee's evaluation of these discrepancies will be examined further. This is considered an unresolved item (85-13-02).

13. Unresolved Item

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviations. Unresolved items disclosed during the inspections is discussed in paragraphs 10 and 12.

14. Exit Interview

The inspectors met with the plant general manager at the conclusion of the inspection period. During this meeting, the inspectors summarized the scope and findings of the inspection.