

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-344/89-33

Docket No. 50-344

License No. NPF-1

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

Facility Name: Trojan

Inspection at: Rainier, Oregon

Inspection conducted: November 26 - December 31, 1989

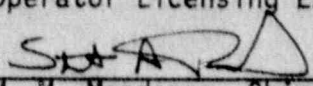
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Approved By:

 For  
M. M. Mendonca, Chief  
Reactor Projects Section 1

1-22-90  
Date Signed

Summary:

Inspection on November 26 - December 31, 1989 (Report 50-344/89-33)

Areas Inspected: Routine inspection of operational safety verification, maintenance, surveillance, event follow-up, system engineering, and open item follow-up. Inspection procedures 30702, 30703, 37702, 40500, 61726, 62703, 71707, 92700, 92701, 92702 and 93702, and Temporary Instruction (TI)2515/104 were used as guidance during the conduct of the inspection.

Results

This inspection discussed two events where licensee procedural noncompliances contributed to licensee identified violations of technical specification requirements that will be followed as unresolved items (Paragraph 6).

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Further, numerous events throughout the inspection report reenforce the need for continued management evaluation of Trojan's performance and evaluation of the effectiveness of initiatives implemented to address past performance problems.

## DETAILS

### 1. Persons Contacted

D. W. Cockfield, Vice President, Nuclear  
+\*C. P. Yundt, Plant General Manager  
+\*T. D. Walt, General Manager, Technical Functions  
A. N. Roller, Manager, Nuclear Plant Engineering  
+C. K. Seaman, Manager, Nuclear Quality Assurance  
\*D. W. Swan, Manager, Technical Services  
M. J. Singh, Manager, Plant Modifications  
J. D. Reid, Manager, Quality Support Services  
\*J. W. Lentsch, Manager, Personnel Protection  
+D. R. Swanson, Manager, Nuclear Safety Branch  
J. F. Whelan, Branch Manager, Maintenance  
J. Mody, Branch Manager, Plant Systems Engineering  
\*D. L. Nordstrom, Branch Manager, Quality Operations  
J. P. Fischer, PM/EA Branch Manager  
T. O. Meek, Branch Manager, Radiation Protection  
\*R. A. Magnuson, Branch Manager, Security  
\*E. F. Petersen, Branch Manager, Maintenance  
\*R. L. Russell, Branch Manager, Operations  
R. N. Prewit, Supervisor, Quality Systems  
J. C. Heitzman, Acting Assistant Operations Supervisor  
N. A. Regoli, Instrument and Control Supervisor  
+\*J. A. Benjamin, Supervisor, Quality Audits  
J. D. Guberski, Nuclear Safety and Regulation Department Engineer  
+\*W. J. Williams, Compliance Engineer  
+M. H. Schwartz, Systems Engineering  
+R. Neiman, ISI Engineer  
+L. G. Dusek, Licensing Engineer  
\*P. G. Nelson, Licensing Engineer  
+B. L. Baker, Nondestructive Engineer

### Volt Personnel

+T. Childress, Quality Assurance Supervisor

### United Energy Services Corporation Personnel

+M. Degraff, Team Leader, Safety System Functional Inspection Team

### U. S. Nuclear Regulatory Commission

\*+R. C. Barr, Senior Resident Inspector  
+\*J. F. Melfi, Resident Inspector  
+D. B. Pereira, Licensing Examiner  
+T. Sundsmo, Licensing Examiner

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 on January 11, 1990.

+Denotes those attending the exit interview on December 1, 1989.

## 2. Plant Status

The facility operated at 97% power from November 26, 1989 through December 26, 1989, when power was reduced to repair a leak on the D steam generator upper secondary manway and a failed gasket on an air system pressure regulator. On December 29, 1989, the reactor was returned to 97% power.

## 3. Safety Verification (71707)

### 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.

Daily the inspectors observed control room activities to verify the licensee's adherence to limiting conditions for operation 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. On occasions when a shift turnover was in progress, the turnover of information on plant status was observed to determine that pertinent information was relayed to the oncoming shift personnel.

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.
- (k) Proper storage of compressed gas bottles.

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

evolutions. Logs of jumpers, bypasses, caution and test tags were examined by the inspectors.

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 related to in-progress work activities.

The inspectors examined the licensee's nonconformance reports (NCRs) to confirm that deficiencies were identified and tracked by the system. Identified nonconformances were being tracked and followed to the completion of corrective action.

Routine inspections of the licensee's physical security program were performed in the areas of access control, organization and staffing, and detection and assessment systems. The inspectors observed the access control measures used at the entrance to the protected area, verified the integrity of portions of the protected area barrier and vital area barriers, and observed in several instances the implementation of compensatory measures upon breach of vital area barriers. Portions of the isolation zone were verified to be free of obstructions. Functioning of central and secondary alarm stations (including the use of CCTV monitors) was observed. On a sampling basis, the inspectors verified that the required minimum number of armed guards and individuals authorized to direct security activities were on site.

The inspectors conducted routine inspections of selected activities of the licensee's radiological protection program. A sampling of radiation work permits (RWP) was reviewed for completeness and adequacy of information. During the course of inspection activities and periodic tours of plant areas, the inspectors verified proper use of personnel monitoring equipment, observed individuals leaving the radiation controlled area and signing out on appropriate RWP's, and observed the posting of radiation areas and contaminated areas. Posted radiation levels at locations within the fuel and auxiliary buildings were verified using both NRC and licensee portable survey meters. The involvement of health physics supervisors and engineers and their awareness of significant plant activities was assessed through conversations and review of RWP sign-in records.

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.

No violations or deviations were identified.

4. Maintenance (62703)

The inspector observed the licensee perform corrective maintenance and troubleshooting on the A Reactor Trip Breaker (RTB). At 7:58 pm on December 2, 1989, a control room operator identified that one of the closed indication lamps for the A Reactor Trip Breaker was not lighted even though that trip breaker was closed. The operators changed that

light bulb to assess if the bulb had failed; however, the replacement bulb also did not light.

To understand the operational significance of the indication circuitry malfunction, the operators reviewed the RTB electrical schematic. They identified that the light bulb was in series with the shunt trip coil. The shunt trip coil provides an alternate (backup) trip to the breaker on failure of the undervoltage coil circuitry. The operators verified that the undervoltage coil circuitry was operable and concluded that the shunt circuitry was not operable. Therefore, the operators concluded Trojan Technical Specification (T.T.S.) 3.3.1, action 12 (RTB to be restored within 48 hrs.), was applicable.

To troubleshoot and repair the loss of closed indication on the A RTB, the operators wrote urgent Maintenance Request (MR) 89-50028. The resident inspector observed the licensee conducting portions of this maintenance activity.

The licensee drafted work instructions and bypassed the A Reactor Trip Breaker using the RTB bypass breaker. Electricians verified that the indicating light was receiving voltage at the RTB terminal compartment and behind the control panel. The electricians then removed the resistor at the lamp socket and determined that the resistor had failed. The licensee removed the resistor from the B RTB bypass breaker open indication and put it in the A RTB closed indication. The light indication was verified to work. The licensee subsequently obtained a replacement resistor from the warehouse and put it on the B RTB bypass breaker.

No violations or deviations were identified.

#### 5. Surveillance (61726)

On December 8, 1989, an inspector observed portions of the performance of Periodic Operating Test (POT) 5-1, "Auxiliary Feedwater System Pump and Valve Inservice Test," on the Steam Driven Auxiliary Feedwater (AFW) pump. This surveillance satisfies the requirements of technical specifications 4.0.5 and 4.7.1.2.1.c.

The inspector noted that the procedure was reviewed by the appropriate licensee personnel. The equipment was tagged out before the test was started, and the instrumentation used during the performance of the test was within its calibration cycle.

The inspector observed the operator remove the system from service and perform portions of the test. The operator conducted the test with the appropriate procedure sections in hand. The pump started smoothly and achieved rated pressure and flow.

The inspector noted that the procedure was not followed step-by-step. Step 7.2.3.c requires the controlling air supply to the steam supply valves be isolated. Specifically, on step 7.2.3.c, the first part of the step is to close Instrument Air (IA) valves 68 through 71. These valves are in individual bays located in the main steam support structure. The

next part of the step was to open the pressure plugs (PP 2480 through 2483) to the control valves in order to bleed any trapped (residual) air. There is one pressure plug in the vicinity of each IA valve. The operator closed an IA valve and then removed its associated pressure plug for a particular steam supply valve so that he would not have to go to each bay and shut each valve and then return and remove each plug. The operator did not seek guidance on whether his approach was acceptable. Further inspector review found that plant administrative procedures require step-by-step compliance only when specifically stated and in this instance step-by-step compliance was not required.

The test results met the technical specification requirements.

No violations or deviations were identified.

6. Event Follow-up (93702, 62703, 92701 and 40500)

Incomplete Reactor Coolant System Power Operated Relief Valve (PORV) Channel Functional Calibration

On December 5, 1989, it was discovered that the required surveillance testing had not been performed for all of the circuitry of the PORV. The licensee discovered the deficiency when performing a design change as a result of a commitment made to the NRC. The licensee was evaluating methods to test the new design change while near the completion of the design package. The licensee then discovered that there was no pre-existing procedure which tested the auxiliary relays in the PORV control circuit.

To comply with technical specifications, the licensee declared the valves inoperable and closed the PORV block valves. To inform the operating staff, the licensee wrote night orders describing the situation. The inspectors reviewed the night orders and concluded that the direction in the night orders could have more explicitly defined when the PORVs were to be used. As a result of discussion with licensee management, additional guidance was provided to the operators to only operate the PORVs if there was a danger to the plant per 10 CFR 50.54 (x). The licensee determined that the event was reportable and issued LER 89-32 on this event. Since the non-tested relays were not designed to be routinely tested, the licensee wrote a Temporary Plant Test (TPT) to lift leads and check this circuit. The licensee performed this TPT and the valves were cycled satisfactorily. The licensee also determined that this surveillance had not been performed since technical specification amendments in 1982 (amendments 73 and 78) implemented PORV testing. This will be followed as an unresolved item pending evaluation of licensee corrective actions (89-33-01). An unresolved item is a matter about which more information is required to ascertain whether it is an acceptable item, or deviation, or a violation.

Containment Air Lock Surveillances

On December 26, 1989, the licensee performed the six month Local Leak Rate Test (LLRT) on the containment air lock at the 45 foot elevation. The containment air lock provides access into and out of containment, as

well as a pressure integrity boundary against a design basis loss of coolant accident.

The licensee performed this activity under Maintenance Request (MR) 89-10942. The workers installed clamps on the inner door and started pressurizing the air lock to design pressure (60 psi). They had reached approximately 30 psi when the workers determined (based on previous experience) that the air lock was taking excessively long to pressurize. They also noticed that the equalizing valve was not holding pressure. They depressurized and examined the equalizing valve. The workers noticed that the equalizing valve mechanical interlock linkage arm had a standard threaded nut vice a NYLOC nut. The workers then tightened the nut in an attempt to correct the leakage. A separate maintenance request was written to install the correct type of nut (NYLOC). The workers then successfully performed the test. After the test, the worker discovered the old NYLOC nut approximately 12 inches away from the valve, installed it, and documented it on MR 89-10942. The workers had not considered the first LLRT test to have failed and, therefore, did not report the test as a failure. A shift supervisor was informed by a maintenance engineer of what occurred on December 29, 1989. The failure of the first test immediately raised operability concerns with the shift supervisor.

A failure of a containment air lock LLRT places the plant in a 24 hour action statement by Technical Specification 3.6.1.3. The on-shift maintenance supervisor also did not recognize the importance of failing to reach full pressure. However, the second test of the air lock was successful and was conducted within the 24 hour requirement of the technical specifications.

The licensee did verify that similar equalizing valves have the correct nut installed. The licensee was also evaluating the potential contribution of scheduling surveillances with the system engineer not onsite.

The licensee was still evaluating this event at the end of the reporting period. The licensee's actions to address this event will be assessed by the inspector during a follow-up inspection as an unresolved item (89-33-02).

#### Load Rejection During Surveillance Performance

On December 28, 1989, at 11:43 pm, with the reactor at 30% power, a 30 MW turbine load rejection occurred while the operating staff was performing POT-18-2, "Main Turbine and Generator Weekly Operating Tests." As soon as the operating crew recognized a load rejection was in progress, the surveillance was discontinued and the load rejection terminated. To investigate the cause of the turbine runback, the operating crew initiated internal event report ER 89-273. The investigation was in progress at the completion of the inspection period.

A preliminary finding of the licensee's investigation was that direction provided in the Initial Conditions section of POT-18-2 stated not to perform step 7.1.3, "Power Load Unbalance Circuit Testing," if the turbine was at less than 40% load. At the time of the turbine runback



and with the turbine at 30% load, step 7.1.3 was being performed. The licensee investigation noted that the procedure was being used but that the initial conditions had not been referred to by the operator conducting the test nor were precautions contained in the procedure just prior to step 7.1.3.

The licensee has yet to determine why the turbine load rejection occurred. An engineering review of the power load unbalance circuit has been completed. The review concluded that performing testing of the power load unbalance circuitry at 30% power should not have resulted in a turbine load rejection. The licensee has reperformed the test several times, and no runback has been experienced. Licensee evaluation continues.

At 3:30 am, December 29, 1989, the resident inspector, while conducting routine deep backshift inspection and reviewing shift logs, noted that the runback had occurred. The inspector, in discussions with shift supervision and the control operator, was informed that POT-18-2 had not been followed even though this non-safety related test procedure was being used at the time of the event. The inspector was informed that event report 89-273 had been initiated. Additionally, crew personnel had not yet reviewed circuit diagrams to determine why the runback had occurred. The inspector also attended the licensee critique of the event conducted on December 30, 1989. The inspectors will continue assessing the licensee evaluation of this event as it relates to procedural compliance.

#### Inoperable Chlorine Detectors

On December 12, 1989, at 5:08 pm, the licensee declared both trains of the chlorine detection system inoperable because the chlorine sensing devices (AIS 9000A and AIS 9000B) could not be verified to meet the response time requirements assumed in the Final Safety Analysis Report (FSAR). The facility, therefore, entered Technical Specification 3.3.3.6, action b., which requires the control room emergency ventilation to be placed in the recirculation mode within one hour of discovering both chlorine detection systems inoperable. This action was completed at 5:18 pm. Additionally, the licensee, per 10 CFR 50.72, informed the NRC via the Emergency Notification System (ENS) that these actions had been implemented.

Technical Specification 3.7.6.1 requires two independent control room emergency ventilation systems to be OPERABLE which includes the capability to automatically initiate on a safety injection. With one control room emergency ventilation system having its makeup dampers in pull-to-lock, as was required due to the chlorine detector inoperability, that train would not function as required by T.S. 3.7.6.1. After evaluating methods to operate the control room emergency ventilation system, the licensee concluded that the definition of being in the recirculation mode for control room ventilation included having the recirculation fans in automatic, but not operating, and the make-up supply air dampers in automatic but shut. In this lineup, the emergency control room ventilation system would auto-start on a safety injection

signal and the licensee was no longer in the T.S. 3.7.6.1 action statement.

On December 19, 1989, at 2:49 pm, the licensee shifted the emergency control room ventilation system to this lineup. At 3:29 pm, on December 19, the operating crew who shifted the lineup, recognized that the make-up dampers for the off-service emergency control room ventilation system were open and, therefore, the facility was unknowingly in T. S. 3.0.3 by not complying with T. S. 3.3.3.6 (chlorine detector operability).

The licensee immediately shut the make-up dampers and initiated an internal event report (ER 89-260). At 4:29 pm, the licensee notified the NRC via the ENS of this event. Preliminary licensee event findings indicated that at 2:49 pm, when the change in lineup for the emergency control room ventilation lineup occurred, the operators conducting the evolution did not refer to or use operating instruction OI-10-2.1, "Control Building HVAC-Control Room Ventilation," revision four. Additionally, this procedure had not been changed to indicate the desired mode of operation. Licensee evaluation of this event was continuing at the conclusion of this inspection period.

The inspectors met with licensee management immediately following the event to discuss procedural compliance and control of off-normal evolution. The inspectors reviewed OI-10.2.1 and operator training on the control room emergency ventilation system. The inspectors concluded the training the operators received in conjunction with the procedure content should have been sufficient to prevent this event from occurring. The inspector will continue assessing licensee evaluation of this event during routine follow-up.

With the control room outside air dampers closed, the control room carbon dioxide levels increased to the point that the licensee had to open outside air dampers and conduct air exchanges. The licensee had done this using T.S. 3.0.3, and had reported this to the NRC via the ENS. The licensee proposed an emergency technical specification change to T.S. 3.3.3.6 which would permit venting the control room for periods up to one hour with appropriate compensatory measures. This emergency technical specification change was approved on December 28, 1989, and will be in effect until the licensee satisfactorily demonstrates chlorine monitor response or at the latest March 15, 1990.

No violations or deviations were identified.

7. Follow-up of Licensee Event Reports (40500 and 92700)

LER 88-39, Revision 1 (Closed), "Incomplete Calibration of RTDs Due to Assumed Drift Value of Zero." This revised licensee event report provides conclusions reached as a result of performing long term actions and updates actions planned with respect to calibration of reactor coolant system wide range RTDs. The licensee concluded that sufficient margin existed in temperature parameters used in the reactor protection system to accommodate a potential one degree Fahrenheit error. The

inspectors discussed the LER with the compliance engineer, and reviewed RTD calibration data and data gathering techniques.

LER 89-17, Revision 1, (Closed), "Reactor Trip on Over Temperature Delta Temperature Signal." This revised licensee event report, based on a continuing investigation, provided licensee conclusions as to the most probable cause of the August 9, 1989, reactor trip on over temperature delta temperature. The licensee concluded that the most likely cause of the trip was an intermittent open in channel four OT Delta T reactor trip logic due to an inadequate connection. The inspectors performed extensive follow-up of this event as reported in inspection reports 50-344/89-20 and 50/344/89-24.

LER 89-21, Revision 0, (Closed), "High Head Safety Injection Inoperable Operations of Volume Control Tank Isolation Due to Procedural Error." This licensee event report described the potential inoperability of both centrifugal charging pumps, due to a procedural deficiency, if a safety injection were to occur while conducting Emergency Core Cooling System (ECCS) valve in-service testing (IST). The licensee concluded that the cause of the event was an inadequate review of a 1976 change to a surveillance test. The licensee concluded this surveillance had been conducted quarterly since 1976 with the potential for gas binding of the centrifugal charging pumps if a safety injection were to occur in conjunction with performing the surveillance. Further, the licensee concluded that no safety injection signal had occurred while performing the surveillance. As corrective action, the licensee has discontinued performing the surveillance testing until appropriate procedure changes are made. Additionally, the licensee will alert the reactor vendor to this deficiency as the concern may be generic to Westinghouse reactors. The inspectors verified that surveillance testing of MO-112B and MO-112C has been discontinued and that safety injections had not occurred during previous surveillance testing.

LER 89-22, Revision 0, (Open), "100% Power Reference Temperature Used in Rod Control System Program Different Than the Value Used in the Safety Analysis." This licensee event report described using a nonconservative value for the reference temperature used in the rod control system automatic program. In the Trojan safety analysis, the vendor assumed a value of 584.7 degrees F. for reference. In 1976, the licensee changed reference to 586.4 degrees F. to achieve design bulk average temperature; however, the licensee did not fully recognize the affect that raising reference would have on the Accident Analysis. As corrective actions, the licensee immediately returned reference to less than 584.7 degrees F. and performed a safety evaluation to determine the impact of operating at an elevated reference. Additionally, the vendor, in conjunction with the licensee, is performing an evaluation of the impact on the safety analysis for the affects of operating at a reference of 586.4 degrees F., for the loss of coolant accident and steam generator tube rupture accidents. This event report will remain open until the result of this evaluation is completed.

LER 89-23, Revision 0, (Closed), "Containment Integrity Violated During Local Leak Rate Testing." This event report described the violation of Technical Specification 3.6.1.1, "Containment Integrity," that occurred

while conducting local leak rate testing of containment electrical penetrations when in Modes 1-4. The licensee has not yet established the cause of the event, is continuing the evaluation, and will submit a revised report. To date, the licensee has identified that a lack of technical understanding of how the electrical penetration serves as a containment boundary and deficiencies in the surveillance procedure have contributed to the event. To prevent similar events, the licensee has discontinued leak rate testing of containment electrical penetrations while in Modes 1-4 and will revise the surveillance procedure prior to performing leak rate testing of electrical containment penetration. This LER is closed based on actions taken to date and plans to submit a revised LER upon determination of root cause.

LER 89-25, Revision 0, (Closed), "Required Trending of Control Building Through Wall Bolts Not Completed Due to Personnel Errors." This licensee event report described a violation of Technical Specification 4.7.11.1.e that required trending of non-retensioned bolts used to strengthen the control building walls. The licensee concluded that even though the required surveillance had not been performed, the tensioning of the bolts was within technical specification requirements. Additionally, as documented in inspection report 89-29, NRC inspectors identified that the surveillance interval had been exceeded one time (a non-cited violation). The licensee determined the causes of the event to be personnel error in that personnel failed to track and document bolt tensioning, and a change to the technical specifications that was not properly processed. The NRC inspectors also identified that the licensee surveillance tracking system did not include the tracking and evaluation of this surveillance. To prevent recurrence of this event, the licensee plans to add this surveillance to their tracking system, complete the fifth year surveillance report, and evaluate a change to the technical specifications. Additionally, the licensee has organized a task force to evaluate the surveillance tracking system and provide recommendations for improvements.

LER 89-27, Revision 0, (Closed), "Containment Ventilation Isolation Due to Electronic Noise Spike." This licensee event report described a containment ventilation isolation generated by a signal from the containment intermediate level noble gas process radiation monitor (PERM 1 D). The licensee had initially concluded the cause of the event to be an electronic noise spike, but due to many previous similar events, is continuing the evaluation of this event and will provide a revised LER. The licensee concluded that the isolation was an electronic malfunction because other radiation monitors measuring the activity of the effluent did not indicate abnormal (elevated) radiation levels. This LER is closed based on actions taken to date and plans to submit a revised LER when the root cause is determined.

LER 89-28, Revision 0, (Closed), "Personnel Error in Preparing Procedure Results in Missed Rod Position Surveillance." This licensee event report described a violation of technical specification surveillance requirement 4.1.3.2, "Position Indication Channels Surveillance Requirements." Monitoring of the shutdown bank rods was not performed every four hours as required when the Rod Position Deviation Monitor was inoperable. The licensee concluded the cause of the event was personnel error due to a

failure to include space for recording the rod position for the shutdown banks on the surveillance data sheet and a contributing cause of operators not recognizing a disparity in the frequency in which the control and shutdown bank rods were recorded. To prevent recurrence of the event, licensee corrective actions included deviating the surveillance procedure data sheet to include both the shutdown and control bank rod positions, issuing a training bulletin that clarified the operation of the rod deviation monitor, and changing the plant computer's software to insure rod position updating following a computer restart. The inspectors conducted a follow-up inspection of this event and issued a violation as documented in inspection report 50-344/89-20. The inspectors concluded a contributing cause of the event to be the lack of knowledge by the operators of the technical specification requirement to increase the surveillance of rod position monitoring from twelve hours to four hours when the rod deviation monitor is inoperable. Additionally, no licensee administrative control was implemented to verify the operability of the rod deviation monitor prior to shifting from four to twelve hour surveillances. The licensee training bulletin discussed these deficiencies.

LER 89-29, Revision 0, (Closed), "Fire Dampers and Penetrations Surveillances Not Performed Within Required Time Frames Due to Personnel Error." This licensee event report discussed the violation of Technical Specification 3.7.9, "Penetration Fire Barriers," due to missing the surveillance periodicity requirement. The licensee has not yet determined the cause of the event and will submit a revised LER. Licensee corrective actions included immediate implementation of the compensatory actions of checking local smoke detector operability and establishing hourly fire patrols. Subsequently, the licensee tested fire dampers, as required, by November 30, 1989. Additionally, the licensee recognized that the surveillance tracking of Appendix R associated technical specification requirements employs a different tracking system than used by operations; therefore, the surveillance task force will also evaluate this area. This LER is closed based on actions taken to date and the licensee commitment to submit a revised LER.

No violations or deviations were identified.

8. Followup on Corrective Actions for Violations (92702)

Enforcement Item 50-344/89-17-01 (Closed), "NCAR/ER per PGE-1080 Was Not Initiated Within a Reasonable Time (Boiling in RHR/CCW Heat Exchanger)." The licensee responded to the Notice of Violation via letter dated October 12, 1989. The licensee attributed the violation to the personnel error of failure to comply with the procedure. As corrective actions, the licensee issued Event Report 89-105 describing this event and counseled all operating crews and members of the plant staff involved in this event.

Enforcement Item 50-344/89-17-02 (Closed), "Inadequate Procedure (OI-T-61 Rev 0) RHR/CCW Heat Exchanger Exceeded Design Analysis Temperature." The licensee responded to the Notice of Violation via letter dated October 12, 1989. The licensee attributed the violation to personnel error in not performing an adequate safety evaluation and technical review,

resulting in an inadequate procedure. As corrective actions, the licensee counseled members of the plant staff involved in the initial safety evaluation, performed a walkdown of the associated systems, reviewed the systems' design bases to ensure design limits were not exceeded, and distributed a "lessons learned" notice to employees. Plant procedures GOI-4 (Plant Shutdown From Hot Standby to Cold Shutdown) and OI-4-1 (Residual Heat Removal) were revised to limit Component Cooling Water (CCW) temperature and minimum RHR flow through the RHR heat exchanger. Actions have been initiated to replace RHR heat exchanger valves by 1991 to allow RHR flow to the heat exchanger to be more effectively throttled.

Enforcement Item 50-344/89-17-03 (Closed), "Use of Procedure That Could Not Be Performed as Written." The licensee responded to the Notice of Violation via letter dated October 12, 1989. The licensee attributed the violation to the personal error of failure to comply with the procedure. As corrective actions, the licensee revised procedure OI-T-61 in accordance with AO-4-4 (Procedure Additions, Revisions, Deletions, Deviations and Corrections) and counseled individuals involved with this event concerning their responsibility to follow procedures. The inspectors verified that OI-T-61 was revised.

Enforcement Item 50-344/89-17-04 (Open), "EPA BZ03 Wires Pulled Without Changing Work Instructions Or Obtaining Supervisor Approval." The licensee responded to the Notice of Violation via letter dated October 12, 1989. The licensee attributed the violation to personnel error, namely, failure to comply with AO-3-9, Section 4.9.1 (MR Package Revisions). As corrective action, the incident was discussed with the Plant System Engineering Department regarding the requirements of AO-3-9. The licensee has also committed to develop guidance to specify activities that can be performed by designers and engineers during equipment walkdowns and inspections by January 31, 1990. Development work on this guidance has not been initiated. This item remains open pending completion of actions to prevent recurrence, as stated by the licensee.

Enforcement Item 50-344/89-17-05 (Closed), "Plant Housekeeping." The licensee responded to the Notice of Violation via letter dated October 12, 1989. The licensee attributed the violation to a basic misunderstanding of AO-10-1 (Plant Housekeeping) and lack of control of material (oily rags, oil in buckets, and insulation). A contributing cause was the frequency of supervisory tours of work sites. As corrective actions, the licensee instructed maintenance personnel on the use of temporary closures, housekeeping, and disassembled parts control. AO-10-1 and MP-3-5 were revised to specifically state temporary closure requirements.

Enforcement Item 50-344/89-17-06 (Open), "Request For Evaluation (RFE) Backlog." The licensee responded to the Notice of Violation via letter dated October 12, 1989. The licensee attributed the violation to the personnel error of failure to comply with the requirements of procedure AO-5-5. As corrective action, the licensee has contracted for temporary help to develop an RFE backlog reduction plan, reduce the RFE backlog, and to develop an action plan for improving the RFE process. The contract help is on site, but progress on the other action items was not

available for review. This item remains open pending completion of corrective actions and actions to prevent recurrence, as stated by the licensee.

Enforcement Item 50-344/89-19-01 (Closed) "Containment Sump Screens Missing." The licensee responded to the Notice of Violation via letter dated November 6, 1989. The licensee attributed the violation to an original construction error or an error in the control of preoperational testing of the ECCS subsystems. Failure to recognize the missing screen earlier than July 1989 was attributed to inadequate implementation of the design basis for this ECCS subsystem.

As corrective actions, the licensee has replaced and repaired the containment sump screens and has verified that the design basis of the sump has been restored. To prevent recurrence, Design Basis Documents have been revised to include additional design information on the containment sump, and a review of other safety related systems that use screens has been initiated. The inspectors have verified that the sump screens are in place and that DBDs are being revised.

Enforcement Item 50-344/89-19-02 (Closed), "Containment Sump Inspection Not Performed." The licensee responded to the Notice of Violation via letter dated November 6, 1989. The licensee attributed the violation to an inadequate implementation of the design bases for the containment recirculation sump. A contributing cause was that the procedure for performing the containment closeout inspection lacked the specificity needed to ensure an adequate inspection was done. A contributing reason for the presence of debris in the containment recirculation sump was inadequate adherence to post-work cleanliness requirements.

As corrective actions, the licensee cleaned the sump and verified the sump clean. AO-3-11 was revised to include more specific inspection criteria and added level of detail. Inspection requirements of AO-3-11 were moved to Periodic Engineering Test (PET) procedure PET-5-6. Lockwire has been installed on the containment recirculation sump door to ensure entry into the sump is controlled. The level of detail in procedures is also being evaluated; this procedure upgrade program is approximately 35% complete. DBD Program criteria are being revised and system walkdowns on systems with DBDs are being reperformed. Employee training and tool control measures are also being implemented. A lock will be installed on the containment sump door during the 1990 refueling outage.

The inspectors have reviewed the revised documentation resulting from this violation and noted that the identified actions either have been or are being completed.

Enforcement Item 50-344/89-19-03 (Closed), "Failure to Provide Accurate Information for the Inspection of the Containment Recirculation Sump." The licensee responded to the Notice of Violation via letter dated November 6, 1989. The licensee attributed the violation to personnel error. The error was compounded by an inspection team member inadvertently signing off for the sump inspection by mistake.

As corrective actions, the licensee took disciplinary action with the personnel responsible for failing to perform the initial containment sump inspection, and the licensee performed the inspection again using an upgraded procedure. A separate checklist was developed for inspections of the containment sump which requires independent inspector verification. To prevent recurrence, senior licensee management held meetings with employees to stress procedure compliance and attention to detail.

Enforcement Item 50-344/89-19-04 (Closed), "Inadequate Corrective Actions for Quality Assurance Surveillance." The licensee responded to the Notice of Violation via letter dated November 6, 1989. The licensee attributed the violation to an inadequate understanding and implementation of the containment sump design bases.

As corrective actions, the licensee made changes to the Nuclear Quality Assurance Department (NQAD) management and staff. The position of Manager, Quality Assurance was elevated to General Manager, Quality Assurance. To prevent recurrence, the Nuclear Division Improvement Plan will be continued; NQAD audit, surveillance and trend reports are being reevaluated for effectiveness; and vacancies within NQAD technical disciplines are being filled with degreed personnel whenever possible.

Enforcement Item 50-344/89-19-05 (Closed), "Inadequate Corrective Actions In Implementing the Design Basis Document Program." The licensee responded to the Notice of Violation via letter dated November 6, 1989. The licensee attributed the violation to lack of management accountability.

As corrective actions, the licensee assigned a new Branch Manager, Systems Engineering and required that the Manager, Technical Services complete a performance upgrade program. Also, a plan of action was developed to complete a review of the DBD Program.

Additional DBD Program guidance documents are being developed to state the content and level of detail, and to state the expectations of DBD system walkdowns. The inspectors also verified that the procedure for inspecting the containment and the containment sump had been revised to include specific inspection criteria.

The inspectors verified that the DBD action plan and management reorganization were in place. The new guidance documents for the DBD Program are essentially complete.

Enforcement Item 50-344/89-09-09 (Closed), "Inadequate Procedure Incorporation of Control Room Design Change." The licensee responded to the Notice of Violation via letter dated October 12, 1989. The licensee attributed the violation to personnel error in not identifying the required procedural change, and failure to complete the required procedural change after the discrepancy was discovered by the internal Safety System Functional Inspection (SSFI) team.

As corrective actions, the licensee revised ONI-46 (Loss of 120-VAC Instrument Bus) and reemphasized individual responsibility in this area



to the Operations Support Staff. The licensee is also in the process of upgrading its procedures onto a computer system that will have the capability to perform key word searches. The inspectors have reviewed ONI-46.

9. Follow-up on Open Items (92701)

Open Item 50-344/89-17-07 (Open), "Quality Hot Line (QHL) Formal Tracking Mechanism." The licensee has not yet responded to this item which was initially identified by QHL item number 89-04. This item remains open pending completion of corrective actions and actions to prevent recurrence.

Open Item 50-344/89-17-08 (Open) "Time Frame for As-Built Plant Modifications Package." The licensee has not yet responded to this item, which was initially identified in Inspection Report 89-09. This item remains open pending completion of corrective actions and actions to prevent recurrence.

Open Items 89-12-01 thru 89-12-05 (Open) "Non-Destructive Examination Open Items"

The Inspector reviewed inspection report 89-12, conducted by Messrs. Kerch, Harris, Oliveri, of the NRC, and five NRC contractors, from May 22, 1989 through June 1, 1989. This inspection report presented five violations in the Inservice Inspection (ISI) area. The licensee contested Violation A (Follow-up Open Item 89-12-05), which references that written examinations should be administered without access to reference material (closed book) except that necessary data, such as graphs, tables, specifications, procedures, and codes may be provided. The inspector discussed the violation with the licensee, and the licensee agreed that the violation had occurred and agreed to rewrite the reply to Violation A. Violations B thru E (Open Items 89-12-01 thru 89-12-04) replies were reviewed by the inspector, however the corrective action steps taken to avoid further violations would not be completed until March 21, 1990.

10. Fitness for Duty (FFD): Inspection of Initial Training Programs (YI 2515/104)

On June 7, 1989, the Commission published the final rule and statement of policy on fitness-for-duty programs for commercial nuclear power reactors, with an effective date for program implementation of January 3, 1990. To implement the rule, the licensee conducted training sessions to indoctrinate employees on the requirements of the rule prior to the rule's implementation.

The inspectors attended a policy awareness training session for general employees, a training session for managers/supervisors and a training session for those personnel who perform escort duties. Additionally, the inspectors reviewed applicable licensee Nuclear Department Procedures (NDP 900 series) prior to attending the training.

The inspectors concluded the Policy Awareness Training for the general employees generally addressed the new rule by discussing the following:

- Licensee policy and procedures, including the methods used to implement the policy;
- Personal and public health and safety hazards associated with drug abuse and misuse of alcohol;
- The affect of prescription drugs on the testing and the role of the Medical Officer;
- The employee assistance program (EAP); and
- What is expected of employees and the consequences that may result from lack of adherence to the policy.

The inspectors concluded the FFD training for supervisory and management personnel generally addressed the new rule with respect to managers/supervisor responsibilities by discussing the following:

- Management and supervisors role and responsibility in implementing the program;
- The roles and responsibilities of others such as the personnel, medical, and employee assistance program staffs;
- Techniques for recognizing drugs and indications of the use, sale or possession of drugs;
- Behavioral observation techniques for detecting degradation in performance, impairment or change in employee behavior; and
- Procedures for initiating appropriate corrective action, including referral to the EAP.

Since the licensee does not have employees whose sole function is to serve as an escort, separate escort training sessions were not conducted; however escort training was included in both the Policy Awareness Training for general employees, and the FFD training for general employees and the FFD training for managers/supervisors, since any PGE employee may escort visitors. The training generally addressed the responsibilities of an escort by addressing the following:

- Their responsibilities when escorting;
- Techniques for recognizing drugs and indications of use, sale, or possession of drugs;
- Behavior observation techniques for detecting use of drugs; and,
- Actions to be taken if a visitor is suspected of being under the influence of drugs.

After the training sessions, the inspectors discussed with licensee management potential FFD training improvements. Specifically, for managers/supervisors more detailed explanations of recognizing drugs and behavioral observation techniques were recommended. Additionally, in the managers/supervisors training, the definition of their responsibilities as escorts could have been more detailed. The licensee made changes to the training based on the inspectors observations.

#### 11. Licensee Safety System Functional Inspection

This inspection was to assess the licensee's performance in several areas of technical work during their performance of a Safety System Functional Inspection (SSFI). The areas to be reviewed were Design Basis Document (DBD) reconstruction effort, the system engineer involvement in normal and off-normal plant events, and licensee management involvement in the SSFI inspection.

Trojan, with assistance from an engineering contract firm, United Energy Services Corporation (UESC), conducted a SSFI to assess the design of the service water system. In addition, any deficiencies identified in the design of the system were to be followed into other systems where judged appropriate.

The SSFI objectives were to assess the operational readiness of a selected safety system through determination of the following:

- a. Capability of the system to perform all safety functions.
- b. Whether the system has been adequately tested to perform all safety functions.
- c. Whether the system's components have been maintained to ensure operability under all postulated conditions.
- d. Whether the system's initiating and control functions were effective.
- e. Whether operator training, plant procedures, and equipment accessibility were adequate to ensure proper operations under accident conditions.

The inspector reviewed the SSFI team Design Basis Document (DBD) inspection effort on the service water system. The team discovered that after the replacement of the service water pumps' impellers with larger impellers the pump curves were not replaced with new curves. In addition, the DBD did not reflect this fact or that the pump manual was not updated. The team also discovered that the booster pumps lead/lag logic operated per the design schematics, however the DBD was incomplete in the description of how it operated. The team discovered that Maintenance Request (MR) 89-4971 was initiated to determine how the booster pump's control logic performed their lead/lag functions. (A particular interesting aspect of this discovery was that the simulator training staff was the initiating organization for determining the booster pumps lead/lag functions.) The team found that the MR was

presented to the operations department, and the engineering department. was not presented with the problem to determine functionality or correctness of the lead/lag circuit during the entire investigation. Finally, the SSFI team discovered that DBD open items were not resolved in a timely manner. The inspector concluded that the SSFI's DBD inspection effort appeared to acceptably uncover discrepancies or deficiencies in the DBD. The team discovered the incorrect use of an MR to conduct a design review on the booster pumps lead/lag functions.

The next concern reviewed was the system engineer involvement in normal and off-normal plant events. Several bronze valves were replaced commencing in 1987 with heavier replacement valves which caused a seismic as well as a design pressure concern. The bronze valves were 600 psi design pressure being installed into a 150 psi design area. Normally there would not have been a pressure concern except that the replacement valves had threaded connections and machining was performed for the socket connections. Other aspects of the valve replacement problem occurred, such as hanger supports, valve throttle settings, and seismic category II/I concerns. The system engineer appeared to solve the short term problem, i.e., the particular valve being replaced at the time; but was not making a generic case for future replacements. Eventually all valve replacement concerns were addressed after several valves were replaced. The SSFI team found that system engineer involvement with replacement valves could have been more systematic and concise.

The SSFI team discovered another issue during the walkdown of Emergency Operating Procedures (EOPs) for service water system fire protection considerations. It was concluded that the system engineer and operations personnel were not using the emergency lighting, but were using normal lighting for the EOP walkdowns. Far less than normal light was available to see and direct valve and pump operations using only the emergency lighting. The team determined that valve and pump operations would have been difficult without flashlights while using emergency lighting.

A final issue in this area determined by the SSFI team was a potential conflict between Final Safety Analysis Report (FSAR) and Operating Instruction temperature limits. The FSAR service water temperature limit is 75 degrees F., and in 1985 Trojan contracted Bechtel to evaluate whether a service water temperature of 77 degrees F. was permissible. The evaluation was conducted because the Columbia River was approaching a temperature of 74 degrees F. that summer. Bechtel responded with an evaluation that 77 degrees F. would not affect system operation. Consequently, Operating Instruction (OI) 4-3, "Service Water System Operation," limits service water temperature to 77 degrees F. which is in direct conflict with the FSAR's temperature limit. OI 4-3 is adequate to operate the service water system but this conflict in limits indicated that the review of the OI and the FSAR by the system engineer or engineering management may have been inadequate.

The last area reviewed was management involvement in the SSFI inspection. During the SSFI of the service water system, plant management was involved in the SSFI by having representatives from maintenance, operations, and engineering interacting with the SSFI team members. In addition, at each briefing in the morning and at the end of the day,

plant management and supervisors were present to receive the details of the SSFI team findings. The SSFI team used a Request for Information (RI) form to obtain further details of particular problems or design requests. These RIs were provided to the organization from which the answers could be obtained. Generally, the answers were provided with sufficient detail by the cognizant engineer or personnel.

It appears that the management involvement in the SSFI team inspection was acceptable for the problems uncovered. The RIs were answered either the day they were requested or the next day. Management attention was observed by the inspector from all levels, including the Plant Manager.

The inspector made the following observations concerning the SSFI team inspection: The team members appeared knowledgeable and experienced in their respective areas; licensee management appeared to be very responsive to the identified issues or discrepancies as they appeared or as requested by the RIs; the SSFI team's depth of review appeared to be sufficient to uncover discrepancies or design deficiencies; the licensee's engineering support of the SSFI team findings was responsive and the SSFI team objectives were being met.

12. Exit Interview (30703 and 30702)

The inspectors met with the licensee representatives denoted in paragraph 1 on December 1, 1989 and January 11, 1990, and with licensee management throughout the inspection period. In these meetings the inspectors summarized the scope and findings of the inspection activities. The inspectors emphasized the continuing instances of procedural noncompliance, personnel error and inadequate supervision of routine and off-normal activities.