

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-344/89-26

Docket No. 50-344

License No. NPF-1

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

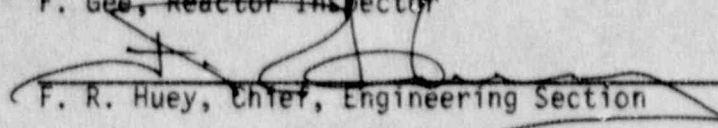
Facility Name: Trojan Nuclear Power Plant

Inspection at: Rainier, Oregon

Inspection Conducted: October 16 through October 20, 1989

Inspectors: J. Burdoin, Reactor Inspector  
F. Geo, Reactor Inspector

Approved by:

  
F. R. Huey, Chief, Engineering Section

11/21/89  
Date Signed

Summary:

Inspection on October 16 through 20, 1989 (Report Nos. 50-344/89-26)

Areas Inspected:

An unannounced routine inspection by two regional inspectors of various vital areas and equipment in the plant, an assessment of the licensee's programs for facility emergency lighting, and followup of open items. Inspection Procedures Nos. 30703, 64704, 71707, 92700, and 92702 were used as guidance for the inspection.

Results and General Conclusions:

Housekeeping and equipment status in the several areas inspected was found to be clean, free of debris, and foreign materials which indicates that these areas are monitored and maintained at regular intervals.

The inspectors closed six open items from the previous inspections, performed a selective walkdown and reviewed a sample of the maintenance records for emergency lighting, and found approximately 9% of the emergency lighting units out-of-service and the repair untimely. The licensee committed to improve the warehouse inventory and to prioritize the repairs of the emergency lighting units.

Significant Safety Matters: None

Summary of Violations or Deviations:

Two violations were identified during this inspection.

One violation addressed the inadequacy in the emergency fire procedure, EFP-2, to provide sufficient detail on the location where fire hoses were stored, the size of the hoses, and the required length of hose for operators to perform the connection between the Service Water System and the fire main manifolds.

The other violation addressed the licensee's failure to verify and check calculations.

Open Items Summary: Six open items were closed.

## DETAILS

### 1. Persons Contacted

The below listed managers, and supervisory and technical personnel were among those contacted:

#### a. Portland General Electric Company

- R. Amundson, Operations Training Specialist
- \*S. Bauer, Regulatory Branch Manager
- \*J. Benjamin, QA Audit Supervisor
- T. Perquam, Unit Supervisor Electrical Maintenance
- K. Bohlander, Nuclear Safety and Regulation Department
- H. Caballero, Training
- C. Caywood, Operator
- G. Ellis, Unit Supervisor, Operations Training
- C. Fischer, Electrical Maintenance Secretary
- J. Fischer, Manager, Performance Monitoring Event Analysis
- J. Guberski, Regulatory Compliance Engineer
- B. Guy, Maintenance Engineer, Electrical
- M. Hoy, Operations Engineer
- \*J. Lentsch, Manager, Personnel Protection Department
- V. Lenoir, System Engineer, Electrical
- F. Leslie, Records Clerk
- \*G. Lian, Fire Protection Inspector
- E. Miller, Systems Engineer, Instrument Air System
- R. Monsive, Control Operator
- S. Nichols, Training Supervisor
- \*D. Nordstrom, QA Supervisor
- D. Robinson, Nuclear Plant Engineer, Electrical
- \*A. Sanchez, Fire Protection Engineer
- G. Tingley, System Engineer, Supervisor Electrical/Control
- J. Vingerud, Electrical Maintenance, Unit Supervisor
- G. Wachs, Training Specialist
- \*W. Williams, Regulatory Compliance Engineer
- T. Wilson, Systems Engineer, Instrument Air System
- \*P. Yundt, Plant General Manager
- G. Zimmerman, Manager, NSRD

The inspectors also talked with other licensee personnel during the course of the inspection.

\*Attended the Exit Meeting on October 20, 1989.

In addition, the NRC Resident Inspectors attended the Exit Meeting.

### 2. Area Inspection (71707)

An inspection was conducted in the Control and Auxiliary Buildings. The inspectors examined areas and equipment for debris, potential hazards, oil and water leakage, and equipment condition, e.g., oil level,



valve position, and electrical connection configuration and cleanliness. The areas and equipment inspected included:

- A. Two 4160/480V switchgear rooms (trains A and B).
- B. Two 125 V battery rooms.
- C. Two battery equipment areas.
- D. One remote shutdown panel room.
- E. Two diesel generator rooms.

Housekeeping and equipment status appeared to be acceptable.

No violations of NRC requirements or deviations were identified.

### 3. Followup of Previous Inspector Identified Items (92700)

- A. (Closed) Open Item 50-344/87-34-03 Fire Suppression Water Supply System Operability Flow Test Every Three Years.

This item identified the NRC concern that the site fire protection water supply system was not being properly tested and evaluated by the licensee to ensure available water flow and system performance in accordance with recognized standards.

The status of this item was updated in Region V Inspection Report 50-344/88-34, dated October 20, 1988. During this inspection, the inspector examined the completely rewritten procedure, PET 11-1 "Fire Main Loop Flow Test" dated February 9, 1989; and reviewed test results of a flow test conducted on the fire main loop on November 10, 1988. This test utilized procedure PET 11-1 in its rewritten form. The inspector examined the comparison of test results; residual pressure and combined flow of this test with earlier tests conducted during 1986, 1983 and 1981. The November 1988 test results compared well with earlier test results. All of the documentation appeared to be complete and in order. This item is closed.

- B. (Closed) Open Item 50-344/88-34-06, Deficiencies Identified During Walkdown of Procedure For Implementing Alternate Control Room/Cable Spreading Room Safe Shutdown

Some eight separate deficiencies were identified during a walkdown of the procedure for implementing alternate Control Room/Cable Spreading Room safe shutdown as reported in Region V Inspection Report 88-34. The licensee's letter of April 28, 1989 describes the corrective actions taken to resolve these issues.

The inspector took the following actions during his audit of the licensee's corrective measures to resolve the eight identified issues:

- (1) Reviewed rapid and gradual loss of instrument air system test procedures (PET 16-3 and 16-4) and test results.

- (2) Verified adequacy of training on the instrument air system.
- (3) Reviewed procedure (PET 16-4) and test results for Quarterly Instrument Air System Quality Test.
- (4) Verified that EFP-1 has been revised to show:
  - Deenergizing air operated valves at the distribution panels and isolating air system during alternative shutdown and
  - Shift supervisor obtain set of keys to train B RHR pump room prior to evacuating control room.
- (5) Verified by field inspection that:
  - A sound-powered phone jack has been installed and a sound-powered phone is stored at the nitrogen supply for the steam generator PORVs,
  - Cabinets have been provided for the storage of sound-powered phones, except for the Remote Shutdown Station. A Maintenance Request has been initiated to provide a storage cabinet at this location, and
  - The most current revision of the EFPs are stored at safe shutdown stations.

All documents and procedures appeared to be in order and complete. Test data appeared to demonstrate the operability of the alternate method (Nitrogen) of Operation of the pneumatic operated valves, and verified the integrity of the check valves in the system. This item is closed.

C. (Closed) Open Item 50-344/88-34-07, Operator Training.

Several deficiencies were identified during the inspection in this area as reported in Region V Inspection Report 88-34. The licensee's letter of April 28, 1989 describe the corrective actions taken to resolve these issues. The inspector took the following actions during his audit of the licensee's corrective measures to resolve these issues:

- (1) Consulted with Operations and reviewed training schedules and attendance tracking forms to confirm that operating crew members had completed an annual walk-through of the Emergency Fire Procedures (EFPs) during the 1989 Training Cycle.
- (2) Consulted with the training department and reviewed Lesson Plan (LP) 02-K-09-L?, Revision No. 1 and attendance tracking forms to confirm that information pertaining to the availability of diagnostic instrumentation while implementing alternative shutdown outside the control room has been included in the Remote Shutdown Station (RSS) and EFP lesson plans; and that

licensed personnel attended these lectures during the 1988/89 Retraining Sessions.

- (3) Examined the attendance tracking forms to confirm instruction had been conducted for the three job performance measures;
  - (a) miscellaneous operations interface unit-tasks,
  - (b) operation instruction-8-2, auxiliary feedwater, and
  - (c) off-normal instructions-17, control room evacuation.
- (4) Reviewed lesson plan to confirm that information concerning emergency battery light mounting brackets has been included in lesson plan materials. Training has been enhanced to instruct the operators on use of the portable lighting units and the locations of the lighting units and the mounting brackets.

The above documentation appeared to demonstrate the accomplishment of the licensee's corrective actions to resolve the deficiencies of this item. This item is closed.

No violations of NRC requirements or deviations were identified.

#### 4. Followup of Enforcement Items (92702).

##### A. (Closed) Enforcement Item 50-344/89-09-09, Failure to Update ONI for Annunciator Change.

During the Region V Team Inspection, reported in Region V Inspection Report 50-344/89-09, it was found that the off normal instruction (ONI) 46, "Loss of 120 V AC Instrument Bus" did not adequately reflect the current plant configuration. A design modification which replaced the four inverters during 1987/88 refueling outages resulted in changes to the descriptions on windows D-7 and D-8 of the control room annunciator. The procedure ONI-46 had not been revised to reflect the changes to the descriptions for windows D-7 and D-8.

The licensee's letter dated October 12, 1989 described the following measures to correct this deficiency:

##### Early Corrective Actions

- (1) ONI-46 was amended by procedure deviation D89-353 on June 6, 1989.
- (2) Individual responsibility to provide a complete and thorough closeout of all actions initiated for procedure revision was reemphasized in:
  - A commitment to review and revise Procedure NDP-200-1 to ensure the responsibility and authority of individuals in the design process are understood and



- A review of this event by the Operations Support Staff.

#### Long Term Corrective Actions To Avoid Further Violations

- (1) Long-term corrective action will be provided by Trojan's Procedure Upgrade Program. This program will have a computerized data base with a key word search capability. This new feature of the program will allow searching of procedures for required changes and will ensure the changes enter the revision process in a timely manner.

The inspector reviewed the changes to ONI-46 and Trojan Commitment List (CTL) Number 31581 to revise NDP-200-1 which will ensure the responsibility and authority of individuals in the design process are understood. The inspector confirmed that a review had been conducted with the operations support staff of this event to reemphasize the individual responsibility to provide a complete and thorough closeout of all actions initiated for procedure revisions. The inspector discussed with the licensee the status of the Trojan Procedure Upgrade Program. This program has been contracted to NUS. The pilot computer program, initiated in the winter of 1988, was basically completed in the fall of 1988. The main program presently in progress is tentatively expected to be completed during the fall of 1991. The program presently has a procedure title and number search capability with cross references to outstanding NCRs, CTRs, etc. When the program is completed, it is expected to have a key word search capability. The examination of the documentation and the data acquired during conference with various licensee personnel confirms the status of the licensee's above described corrective actions.

The licensee's corrective actions in response to this violation appear to be adequate. This item is closed.

#### B. (Closed) Enforcement Item 50-344/89-09-10, Failure to Calibrate New Inverter Y-26 Instruments.

A design change during the 1988 refueling outage replaced two of the original inverters (Y-26 and Y-28) with new Elgar Inverters. It was found during the team inspection in June 1989 that three instruments (an ammeter, a frequency meter and a voltmeter) had not been calibrated prior to placing the new inverter (Y-26) in service.

The licensee's letter dated October 12, 1989 described the following measures taken to correct this deficiency:

#### Early Corrective Actions

The voltage, frequency and amperage meters were calibrated on July 7, 1989 and subsequently entered in the planned maintenance program for periodic calibration. The "as-found" condition of the voltage and amperage meters was approximately three percent high, the frequency meter was approximately one percent low.

Long Term Corrective Actions To Avoid Further Violations

- (1) The criteria for assigning calibration requirements for installed instruments used in supporting Trojan Technical Specification surveillances will be reviewed and referenced in those procedures used in the design process by December 31, 1989.
- (2) Nuclear Division Procedure (NDP) 200-1 (Design Change Control) is being reviewed and will be revised to ensure that the responsibilities and authority of individuals in the configuration management process are understood by December 31, 1989.
- (3) Administrative Order (AO) 5-1, Plant Changes and Alterations, will be evaluated for consistency with the changes to NDP 200-1 by March 31, 1990.

The inspector examined the maintenance request 89-5983 and the calibration test results for the three meters of concern to verify the licensee's corrective actions to resolve this violation. The inspector confirmed the inaccuracies of 3 and 1 percents for the volt/amp. meters and frequency meter. The meter calibration data sheets appeared to be in order. The industry standard's for tolerances for these meters is  $\pm 2\%$ . As pointed out by the licensee, these meters are required to verify operability of the inverter and are not precise measurements. These small inaccuracies did not affect the operability of the inverters.

The inspector verified that the commitments made by the licensee to review and revise the above identified procedures were in the process of being achieved.

The inspector concluded that the measures taken by the licensee to correct the deficiencies of this violation were adequate and timely. This item is closed.

C. (Closed) Enforcement Item 50-344/88-34-11 Emergency Lighting.

During an inspection made in August 1988 and reported in Region V Inspection Report 50-344/88-34, it was found there were no eight hour battery powered emergency lighting (EBL) units installed in three different areas at the Trojan plant. The licensee's letters of November 18, 1988 and April 28, 1989 responded to this violation.

The licensee identified that an exemption request dated December 30, 1988 had been made to the NRC for the use of six hour portable emergency lighting units in the three areas of concern. An evaluation was made by NRR; and it was recommended that the request be approved in internal NRC memorandum from Plant Systems Branch to Project Directorate V dated August 4, 1989.



The licensee also stated that training was enhanced to instruct the operators on the use of the portable lighting units and the locations of the lighting units and the mounting brackets.

The inspector's method to close the open item was to:

- (1) Check on the status of the exemption request.
- (2) Verify the training of operators by reviewing the training procedures and the enrollment record of the training.
- (3) Have a trained operator demonstrate the mounting of a portable unit.
- (4) Verify that the mounting brackets were positioned adequately for the operation at the respective locations.

The inspector examined copies of licensee's exemption request, dated December 30, 1988, and NRC internal memorandum dated August 4, 1989; and concluded that the request for use of six hour emergency lighting units had been approved for use in the three areas of concern.

The inspector reviewed the training procedures and the enrollment record and concluded that there was a lack of practical factors in the training program. The operators were not required to actually perform the mounting of a portable lighting unit and a walkdown of each of the mounting bracket locations.

A randomly selected operator who had gone through the training was asked to demonstrate the mounting of a portable lighting unit. The unit was taken from the Control Building 45-foot level to the bracket at the south wall of the Fuel building in the Tank Farm in daylight. The operator pointed out that the light from the lighting unit could be used in the dark to guide the operator to the location of the bracket. The operator appeared to know the approximate but not the exact location of the mounting bracket. The operator took three minutes to perform the mounting of the portable units and a total of approximately 20 minutes from the dismounting of the unit in the Control Building to the mounting of the unit at the south wall of the Fuel Building. The inspector concluded that the operator demonstrated adequately the mounting of a portable lighting unit.

The inspector performed a walkdown of the following locations to verify that the mounting brackets were positioned adequately for the operation at the respective locations:

- (1) Circulating water cross-connect service water system valve.
- (2) Fire pump to Service Water System hose connection.
- (3) Fire Water System hose connection to Service Water System.
- (4) Fire hydrant for Service Water System connection.
- (5) Circulating Water Pump outlet valve.
- (6) Circulating Water Pump inlet valve.
- (7) Fire hydrant for condensate storage.
- (8) Condensate storage tank drain valve.

The inspector found that the brackets were adequately positioned.

The licensee's corrective action in response to this violation appeared to be adequate. This item is closed.

No violations of NRC requirements or deviations were identified.

5. Emergency Lighting (64704)

A. Emergency Fire Procedure EFP-2

In the event of a fire, the inventory of the Service Water System could be depleted. There are two sources of water for replenishment: for a short-term duration, the water from the cooling tower basin; and for a long-term duration, the water from the fire main using fire hoses for the connection to the Service Water System. Emergency Fire Procedure EFP-2 was used to define the steps of such an operation.

Emergency Fire Procedure EFP-2, Alternative Shutdown for Complete Loss of Service Water Caused by Fire, Revision 3, Step 23 (Establish Long-Term Alternative Source of Water) was inadequate for the operator to perform the intended function, in that it did not prescribe the location for the six dedicated hoses, the required size of the hoses, or the required length of the hoses.

Furthermore, subsequent to the inspector identifying the deficiency in the procedure, the licensee determined that the previously assumed hose length of 50 feet was inadequate and that a hose length of 100 feet was required to accomplish the steps of the procedure.

When the licensee was asked to show the inspector the location of the hoses, the inspector was taken to Fire Hose Locker Number 1 where the six hoses were believed to be stored. The inspector found inadequate equipment in the locker to complete the six 2.5"x100' hose connections.

During a review of Calculation TNP-83-59, supporting the capability of the fire hoses to supply water to the Service Water System, the inspector noted that a question had been raised by the reviewer of the calculation as to whether the six hoses were available in the vicinity of the fire pump discharge header to connect to the Service Water System. The licensee failed to provide proper followup on the reviewer's concern.

The licensee has initiated corrective actions to revise Emergency Fire Procedure EFP-2 and the inventory list for Fire Hose Locker Number 1 (Periodic Operating Test POT-10-9), including placement of the six 2.5"x100' hoses in the Fire Hose Locker Number 1 for the dedicated use.

The licensee's failure to have an adequate quality related procedure for establishing a heat sink for safety related equipment in the event of loss of service water due to a fire is considered an apparent violation of 10 CFR Part 50, Appendix B, Criterion V (50-344/89-26-1).



B. Calculation TNP-83-59

The assumed length of the fire hose connections between the fire pump discharge header and the Service Water System was a major contributor to the pressure drop in Calculation TNP-83-59, Revisions 0 and 1, "Fire Pump Flow Capability for Appendix R Alternate Cooldown Without Service Water System Pumps and Offsite Power". The calculation used an assumed length of 50 feet, which was not verified by actual measurement.

The licensee committed to make a complete evaluation of the use of the six 100-foot hoses and to revise the calculation accordingly.

The failure of the licensee to exercise proper verification of the adequacy of assumptions to calculations is considered an apparent violation of 10 CFR Part 50, Appendix B, Criterion V (50-344/89-26-2).

C. Illumination Level of Appendix R Emergency Lighting

The inspector performed a walkdown of the Appendix R emergency lighting in the following selected locations. The emergency lighting levels were found to be adequate. The locations included:

- (1) Auxiliary feed water pump rooms.
- (2) Remote shutdown panel.
- (3) High pressure safety injection pump rooms.
- (4) 4.1 KV switchgear room A.
- (5) Emergency diesel generator rooms.

D. Emergency Lighting Maintenance Record Review

The inspector reviewed the 1987 and 1988 maintenance records for the following emergency lighting units:

- (1) West emergency diesel room, EBL-10 and EBL-18.
- (2) 4.1 KV switchgear room A, EBL-55 and EBL-98.
- (3) Atmospheric dump valves, EBL-58 and EBL-59.

The maintenance was performed per Electrical Department Procedure EDP-5-1, Emergency Battery Light Maintenance. The maintenance for the units appeared to be adequate.

The common failures of the emergency lighting units were:

- (1) Card corrosion.
- (2) Battery.
- (3) Float voltage adjustment.
- (4) Light bulb burnout.



The inspector examined a compilation of maintenance work performed on emergency battery lighting units dating back to July 1988. Seventy-seven work orders were prepared, sixty-six work orders were completed, and eleven work orders remained open due to low work priority or parts unavailability. Of these eleven work orders, five were older than ninety days; two were being worked on, two others had material available but lacked priority, and one work order for repairs to EBL-90 was awaiting delivery of material. The eleven units out of service for maintenance represents approximately 9% of 117 emergency lighting units in the plant. Procedure EDP-5-1 requires that a stationary EBL unit out of service for more than one shift be danger tagged and a portable EBL unit or battle lantern be placed to cover the effected area. It was confirmed that all interim corrective measures for EBL units out of service had been taken.

During the inspection week, the licensee completed the repairs to three of the eleven EBL units which had been delayed pending delivery of repair materials. Three additional EBL units for which spare parts were recently received were repaired and returned to service in the two weeks immediately following the inspection. Five units awaiting the delivery of spare parts remain to be repaired.

The licensee committed to upgrade procedures to:

- use fire protection system outage sheets to track EBL units out of service for repairs
- upgrade warehouse stock by procuring four additional EBL units as spares, procuring additional portable EBL units, and procuring additional EBL unit parts to ensure an adequate stock of spares.
- Review program to determine the feasibility of assigning a higher priority for the repair of EBL units.
- ensure EBL units out of service for repairs are returned to service within 60 days.

The maintenance program for EBL units along with the licensee's corrective measures and commitment to upgrade the maintenance program and to increase warehouse stock of spares/parts was found to be acceptable.

Two violations of NRC requirements were identified.

#### 6. Exit Meeting (30703)

The inspectors conducted an exit meeting on October 20, 1989, with members of the licensee staff as indicated in paragraph 1. During this meeting, the inspectors summarized the scope of the inspection activities and reviewed the inspection findings as described in this report. The licensee acknowledged the concerns identified in the report.