



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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February 16, 2005

Mr. Stephen M. Quennoz
Vice President, Generation
Portland General Electric Company
Trojan Nuclear Plant
71760 Columbia River Highway
Rainier, Oregon 97048

SUBJECT: NRC INSPECTION REPORT 050-00344/05-001; 072-00017/05-001

Dear Mr. Quennoz:

An NRC inspection was conducted on January 24-27, 2005, at your Trojan Nuclear Plant facility. This inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspection included an examination of selected procedures and representative records, observations of activities, and interviews with personnel. The enclosed report presents the results of that inspection. Overall, the inspection determined that you have conducted decommissioning activities in compliance with regulatory and license requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact the undersigned at (817) 860-8191 or Mr. Robert J. Evans, Senior Health Physicist, at (817) 860-8234.

Sincerely,

/RA JVEverett for/

D. Blair Spitzberg, Ph.D., Chief
Fuel Cycle and Decommissioning Branch

Docket Nos.: 050-00344; 72-00017
License Nos.: NPF-1; SNM-2509

Enclosure:
NRC Inspection Report
050-00344/05-001; 072-00017/05-001

Portland General Electric Company

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FCDB File

SISP Review Completed: : Yes ☒ No Initials: RJE

ADAMS: : Yes ☒ No Initials: RJE

: Publicly Available ☒ Non-Publicly Available ☒ Sensitive : Non-Sensitive

DOCUMENT NAME: S:\DNMS\Fcdb\RJE\tn0501.wpd

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RIV:DNMS:FCDB	NMSS-DWMEP	C:FCDB
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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.: 050-00344; 072-00017

License Nos.: NPF-1; SNM-2509

Report No.: 050-00344/05-001; 072-00017/05-001

Licensee: Portland General Electric Company

Facility: Trojan Nuclear Plant

Location: 71760 Columbia River Highway
Rainier, Oregon 97048

Dates: January 24-27, 2004

Inspectors: Robert J. Evans, P.E., C.H.P., Senior Health Physicist
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Approved By: D. Blair Spitzberg, Ph.D., Chief
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Attachments: Supplemental Inspection Information

ADAMS Entry: IR 05000344-05-01; 07200017-05-01 on 01/24-27/2005; Portland
General Electric Co.; Trojan Nuclear Plant; Decommissioning
Report; No Violations.

EXECUTIVE SUMMARY

Trojan Nuclear Plant
NRC Inspection Report 050-00344/05-001; 072-00017/05-001

The inspectors reviewed the licensee's implementation of organization, management, and cost controls; safety reviews, design changes, and modifications; self-assessment, auditing, and corrective action; operation of an Independent Spent Fuel Storage Installation (ISFSI); cold weather preparations; decommissioning performance and status review; occupational radiation exposure; final surveys; radioactive waste treatment, and effluent and environmental monitoring; solid radioactive waste management and transportation of radioactive materials; and followup of a previous inspection finding. In summary, the licensee was conducting decommissioning activities in accordance with regulatory and license requirements.

Organization, Management, and Cost Controls at Permanently Shutdown Reactors

- The licensee had an organization in place that was sufficient to conduct decommissioning and ISFSI support activities. The organizational structure was in agreement with quality assurance plan and ISFSI Safety Analysis Report requirements. The licensee planned to reduce site staffing as the decommissioning work load continued to decrease (Section 1).

Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors

- The inspectors reviewed three safety evaluations and concluded that the licensee had conducted a thorough technical review of each document and the review conclusions were consistent with regulatory requirements of 10 CFR 50.59 and 72.48 (Section 2).

Self Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors

- The licensee continued to maintain an effective program for scheduling and implementing quality assurance audits. One audit and one surveillance were noteworthy because each identified potential problems within the areas audited. These potential problems were entered into the licensee's corrective action process to ensure timely correction (Section 3).
- The licensee continued to maintain an ISFSI safety review program in accordance with the ISFSI Safety Analysis Report requirements. The ISFSI Safety Review Committee continued to provide independent oversight of ISFSI operations (Section 3).

Operation of an ISFSI

- Independent Spent Fuel Storage Installation operations were being conducted in accordance with applicable requirements, including routine temperature monitoring, vent screen inspections, and concrete cask integrity inspections. Site tours confirmed that concrete cask temperatures and vent screen integrity continued to be monitored by the licensee. The inspectors confirmed that the licensee had established off-normal procedures for increased ISFSI monitoring and ash removal if a volcanic event were to occur.

- The ISFSI staff had been trained to conduct radiological surveys and continued to monitor radiation and contamination levels in and around the ISFSI pad. The results of recent radiological surveys were reviewed, and the results were within procedural limits. Annual reports of radioactive effluents and special nuclear material inventories continued to be submitted to the NRC (Section 4).

Cold Weather Preparations

- The licensee conducted annual cold weather inspections and walk-downs in accordance with maintenance work order instructions (Section 5).

Decommissioning Performance and Status Review at Permanently Shutdown Reactors

- Site tours confirmed that all remaining radioactive material had been removed from the plant with the exception of several sealed sources. All radiation protection postings had been removed except for those in the immediate vicinity of the sealed sources. The licensee planned to transfer all remaining sealed sources in the near future to authorized recipients (Section 6).

Occupational Radiation Exposure

- The licensee continued to maintain an effective program for monitoring occupational radiation exposures. Occupational exposures for calendar year 2004 were small fractions of the regulatory limits (Section 7).

Inspection of Final Surveys at Permanently Shutdown Reactors

- The review of the licensee's final status survey records indicated that the documents had been developed in accordance with procedural requirements. The records indicated that the remaining residual radioactive material in the plant was less than the respective derived concentration guideline levels. The NRC's conclusions of the final status survey reports will be presented to the licensee under separate correspondence (Section 8).

Radioactive Waste Treatment, and Effluent and Environmental Monitoring

- The licensee had established and implemented the radioactive liquid, gaseous effluent, and radioactive environmental monitoring programs. The licensee discontinued the liquid and gaseous effluent sampling programs during 2004. No sample result exceeded any license or regulatory limit and no adverse trends were identified (Section 9).

Solid Radioactive Waste Management and Transportation of Radioactive Materials

- The licensee shipped dry radioactive wastes in accordance with procedural requirements. Shipping records were thorough and complete (Section 10).

Followup

- A previous NRC inspection finding involving the development of acceptance criteria for ISFSI environmental monitoring was reviewed and closed (Section 11).

Report Details

Summary of Plant Status

During this inspection, decontamination and decommissioning activities had been completed in all areas of the site. The licensee still possessed a small number of sealed radioactive sources but had plans for their disposal or transfer to other licensees. The licensee previously submitted all remaining final status survey reports to the NRC. These reports are currently under review by the NRC. The licensee was in the process of preparing the 2004 annual radioactive effluent release report submittal to the NRC during the first quarter of 2005.

The licensee continued to store spent fuel at the onsite Independent Spent Fuel Storage Installation (ISFSI) under Trojan's 10 CFR Part 72 site-specific license. The licensee submitted an application for termination of the 10 CFR Part 50 license to the NRC by letter dated December 20, 2004. The NRC accepted the application on January 11, 2004. The license termination request is currently under NRC review.

1 Organization, Management, and Cost Controls at Permanently Shutdown Reactors (36801)

1.1 Inspection Scope

The inspectors reviewed records and interviewed licensee personnel to ascertain whether management systems contributed to the protection of public health and safety through the proper control, evaluation, and management of decommissioning activities.

1.2 Observations and Findings

The organizational structure was reviewed to determine if the licensee had sufficient staff to conduct remaining decommissioning work including final status survey activities and to monitor the onsite ISFSI. The licensee's organizational structure was described in both the Nuclear Quality Assurance (QA) Program Report (PGE-8010, Revision 27) and the Trojan ISFSI Safety Analysis Report (SAR). The organizational structure in place at the time of this inspection was compared to the requirements specified in the QA report and the ISFSI SAR. The inspectors concluded that supervisory and managerial level positions, as well as the security and radiation protection support staff, continued to be filled with qualified individuals. Decommissioning related staffing levels will continue to decrease over time as the work load continues to decline.

1.3 Conclusions

The licensee had an organization in place that was sufficient to conduct decommissioning and ISFSI support activities. The organizational structure was in agreement with QA plan and ISFSI SAR requirements. The licensee planned to reduce site staffing as the decommissioning work load continued to decrease.

2 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors (37801)

2.1 Inspection Scope

The purpose of this portion of the inspection was to ascertain whether design changes, tests, experiments, and modifications were effectively reviewed, conducted, managed, and controlled in accordance with 10 CFR 50.59 and 72.48.

2.2 Observations and Findings

The inspectors reviewed three safety evaluations, two for the former Trojan plant and one for the ISFSI :

- Safety Evaluation 2004-17 supported a revision to the fire protection program. This proposed change reflected current plant conditions and removed references to the control room, deactivated buildings, plant paging system, and in-plant telephone system.
- Safety Evaluation 2004-18 supported a revision to the Trojan Decommissioning Plan. This proposed change removed the cooling tower from the layout drawing of site impacted areas. This area was previously designated as potentially impacted because the licensee had considered temporary storage of radioactive wastes at this location. The licensee subsequently did not use this area for storage; therefore, the area was never reclassified as impacted. The revised drawing was submitted to the NRC by letter dated January 6, 2005.
- Safety Evaluation 2004-11 supported a change to the ISFSI radioactive effluent control program procedure. In response to a previous NRC inspection finding, the licensee updated Procedure TIP-14, "Trojan ISFSI Radioactive Effluent Control Program and Environmental Monitoring Program," to include acceptance criteria for evaluating radiological environmental monitoring results. Further discussion of this subject is provided in Section 11 of this inspection report.

The inspectors found the safety evaluations to be comprehensive and with sufficient detail to support the conclusions. The inspectors concluded that the modifications were not important to the safe storage of irradiated fuel and that complete 10 CFR 50.59 or 72.48 reviews were not required.

2.3 Conclusions

The inspectors reviewed three safety evaluations and concluded that the licensee had conducted a thorough technical review of each document and the review conclusions were consistent with regulatory requirements of 10 CFR 50.59 and 72.48.

3 Self Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors (40801)

3.1 Inspection Scope

The inspectors evaluated the effectiveness of the licensee's ability to identify, resolve, and prevent issues that had the potential to degrade safety or quality.

3.2 Observations and Findings

a. Quality Assurance Program

Appendix B to 10 CFR Part 50 states that the licensee shall be responsible for the establishment and execution of a QA program. The inspectors reviewed the licensee's planning and scheduling process to determine if all required audits were being conducted. The audit matrices were provided in Trojan plant procedures. The inspectors reviewed the procedure matrices and the January 6, 2005, audit schedule and confirmed that all required audits had either been recently completed or were scheduled for completion in the near future. In summary, the licensee continued to maintain and implement a QA program in accordance with regulatory requirements.

The inspectors reviewed one recently completed audit and three surveillances. An audit of ISFSI operations was conducted during August-November 2004 and documented in Audit No. 413. The auditors identified several findings that were subsequently entered into the licensee's corrective action program. The auditors also documented several recommendations for program improvement. Three surveillances were reviewed, including one internal surveillance and two supplier surveillances. Of particular note was the supplier surveillance of a State of Tennessee licensee. Three quality assurance related restrictions were issued to that licensee because of the surveillance team findings.

In accordance with 10 CFR 71.101 and 72.140, the licensee recently submitted a proposed change to the QA program to reflect the upcoming termination of Trojan's 10 CFR Part 50 license. Proposed Revision 28 to the Trojan Nuclear QA Program (PGE-8010) was submitted to the NRC by letter dated January 21, 2005. If approved by the NRC, the licensee will implement the program concurrent with the termination of the 10 CFR Part 50 license.

b. ISFSI Safety Review Committee

Details of the ISFSI Safety Review Committee were provided in Section 9.6.2 of the ISFSI SAR. The ISFSI Safety Review Committee was required to meet at least annually and at any time deemed necessary by the Corporate Executive. The inspectors reviewed the minutes of the most recent committee meeting, No. 2004-01, held on August 5, 2004. The minutes document that a quorum of members were present and that the members discussed issues that were relevant at that time.

The inspectors noted that the corporate executive recently designated staff personnel as members of the ISFSI Safety Review Committee. The inspectors noted that all committee members were qualified to fulfill those positions. The licensee continued to

maintain a safety review committee that provides independent oversight of ISFSI operations.

3.3 Conclusions

The licensee continued to maintain an effective program for scheduling and implementing QA audits. One audit and one surveillance were noteworthy because each identified potential problems within the areas audited. These potential problems were entered into the licensee's corrective action process to ensure timely correction. The licensee continued to maintain an ISFSI safety review program in accordance with the ISFSI SAR requirements. The ISFSI Safety Review Committee continued to provide independent oversight of ISFSI operations.

4 **Operation of an ISFSI (60855)**

4.1 Inspection Scope

The inspectors reviewed the licensee's control of ISFSI operations to ensure compliance with 10 CFR Part 72, license, Technical Specifications, and SAR requirements.

4.2 Observations and Findings

The inspectors toured the ISFSI area and witnessed the performance of routine operational activities as performed by the ISFSI support staff. The inspectors also reviewed ISFSI operational and surveillance procedures and related records. Overall, the licensee was maintaining the ISFSI in accordance with procedural and regulatory requirements.

The air inlet vents were required to be inspected and verified free of blockage weekly. During site tours, screen blockage was not observed on any of the 34 concrete casks. The ISFSI area was posted as a radiation area. The top of concrete cask E-11 continued to be posted as a high radiation area.

Trojan ISFSI Technical Specification 5.5.3.a. required that the air outlet temperature of the concrete casks and ambient air temperature be measured, and the difference between the two readings calculated and recorded daily. During the ISFSI tours, an ISFSI Specialist demonstrated the process of how the air outlet and ambient temperatures were measured, calculated, and recorded utilizing the Fluke Model 2286A data logger. On that day, the highest outlet temperature, obtained from concrete cask E-11, was 109 degrees Fahrenheit with an ambient temperature of 42 degrees. The temperature differential was 67 degrees, a value below the first action level of 180 degrees as defined in Trojan procedure TIP 17, which requires increased monitoring.

The inspectors also confirmed that the licensee continued to trend the concrete cask temperatures in accordance with procedural requirements. The most recent monthly trend report, finalized on January 25, 2005, concluded that the temperatures were fluctuating as expected, primarily because of wind and ambient temperature changes.

The licensee recently experienced problems with temperature element E25A. During November 2004, this temperature element indicated an erroneous, intermittent temperature reading. The licensee issued Maintenance Request MR0050 but was unable to clearly identify the source of the problem because there was no longer an erroneous reading. The licensee closed the maintenance request but continued to closely monitor the temperature element for any future erroneous readings. If the temperature element were to fail completely, the licensee could continue to obtain the daily measurements using a hand-held temperature probe.

In accordance with the concrete cask monitoring procedure, the ISFSI Specialists were required to conduct general area gamma radiation surveys on a weekly basis. The inspectors reviewed the training program for ISFSI Specialists to ensure that these individuals understood how to conduct the surveys. The inspectors confirmed that each individual had received training in use of the RO-20 survey meter (type used during the weekly surveys), including demonstration of meter use.

The requirements for the ISFSI structural inspections are provided in Section 9.7.6 of the SAR. The structural inspection program requires periodic inspection of the concrete surface of the concrete cask. The inspections help ensure that the structural integrity of the concrete is maintained. The inspectors observed the licensee conducting a structural inspection of a concrete cask. The structural inspection included a detailed review of the concrete cask surface and vent screens. The individual conducting the structural inspection appeared knowledgeable of the task being performed. The inspectors confirmed that the structural inspection was being conducted in accordance with procedural requirements.

The ISFSI has been used to store concrete casks since January 2003. Since that time, only one defect has been identified. During January 2004, concrete cask E-22 was identified to have a defect because the void in the surface of the concrete exceeded 1/2-inch in diameter and 1/4-inch in depth. The area was cleaned and silicone sealant was installed to prevent further degradation. The licensee documented the defect in its logbook in accordance with procedural requirements. The defect was not a concern to the inspectors because the depth of the defect (under an inch) was small compared to the overall thickness of the concrete (approximately 3 feet) in the concrete cask. Further, the licensee conducted radiological surveys in the area of the defect and no observable differences were identified between the area of concern and surrounding areas.

The inspectors reviewed off-normal instruction ONI 72-03, Revision 0, "Response to Natural Phenomena Events." In particular, the inspectors attempted to ascertain whether the licensee had response instructions available in case of volcanic activity in the area. The procedure was noted to contain instructions to monitor the ISFSI on an increased frequency during a volcanic event and for ash removal. The procedure included a list of necessary supplies. The supplies were found to be readily available for use by ISFSI staff personnel.

An annual physical inventory was required by 10 CFR 72.72(b). Details of how to conduct the inventory was provided in Trojan ISFSI Procedure TIP-11, Revision 3, "Control and Accounting of Spent Nuclear Fuel in ISFSI Storage." The inspectors verified that the licensee continued to conduct the annual inventory. The inventory and

reporting of material status results were being submitted to the NRC in annual reports. The most current annual report was submitted to the NRC on February 3, 2004. The licensee planned to submit the next annual report during February 2005.

Quarterly area radiological surveys were required by Section 7.5.3.2.5 of the ISFSI SAR. These surveys consisted of contamination surveys and external radiation measurements. The most recent surveys were conducted during November 2004. The survey results were reviewed during this inspection. The results document that no removable contamination was present. The gamma exposure rates varied with distance from the concrete casks on the ISFSI pad, from 7 $\mu\text{R/hr}$ inside the Trojan Central Building (background levels) to 130 $\mu\text{R/hr}$ at the east fence adjacent to the ISFSI. The exposure rates appeared consistent with the exposure rates measured with environmental thermoluminescent dosimeters (TLDs) around the ISFSI.

Section 7.5.2.1 of the ISFSI SAR provided the radiation protection instrumentation requirements. This section stated that the licensee will not maintain survey instrumentation at the ISFSI. The inspectors noted that the licensee intended to perform radiation protection measurements using site staff and dedicated equipment. The licensee stated during the inspection that a new staff position had been created for this activity. The licensee planned to revise this section of the SAR through the 10 CFR 72.48 process prior to termination of the 10 CFR Part 50 license.

The Trojan ISFSI Technical Specification 5.5.2.b stated that the radioactive effluent control program would include an environmental monitoring program. The program implementation details were provided in ISFSI Procedure TIP-14, "Radiological Effluent Control Program and Radiological Environmental Monitoring Program," Revision 3. The licensee used environmental TLDs to monitor ambient gamma exposure rates. The licensee exchanged the TLDs on a quarterly basis. The inspectors reviewed the sample results for 2004 and confirmed that no TLD sample result exceeded the associated acceptance criteria established in TIP-14.

The Trojan ISFSI Technical Specification 5.5.2.c and 10 CFR 72.44(d)(3) required that an annual report be submitted to the NRC specifying the quantity of each of the principal radionuclides released to the environment in liquid and in gaseous effluents during the previous 12 months of operation. The licensee submitted the required report for 2003 on a timely basis. The licensee planned to submit the 2004 report to the NRC during February 2005. Since the Trojan ISFSI is by design a sealed system, no gaseous or liquid effluents were expected to be released.

4.3 Conclusions

Independent Spent Fuel Storage Installation operations were being conducted in accordance with applicable requirements, including routine temperature monitoring, vent screen inspections, and concrete cask integrity inspections. Site tours confirmed that concrete cask temperatures and vent screen integrity continued to be monitored by the licensee. The inspectors confirmed that the licensee had established off-normal procedures for increased ISFSI monitoring and ash removal if a volcanic event were to occur.

The ISFSI staff had been trained to conduct radiological surveys and continued to monitor radiation and contamination levels in and around the ISFSI pad. The results of recent radiological surveys were reviewed, and the results were within procedural limits. Annual reports of radioactive effluents and special nuclear material inventories continued to be submitted to the NRC.

5 Cold Weather Preparations (71714)

5.1 Inspection Scope

The licensee's program for preparing plant systems and components for cold weather conditions was reviewed.

5.2 Observations and Findings

Although all remaining spent fuel had been transferred to the ISFSI, the licensee continued to conduct cold weather inspections using maintenance work orders. Plant Maintenance Request No. 555 provided instructions for an annual walk-down of remaining portable water, vehicle, and fire protection systems. The work was conducted to ensure that any piping or equipment that contained fluids which were subjected to freezing were insulated or otherwise protected from the elements. The work instructions included replacement of a yard hydrant and rerouting of a discharge line. The work encompassed a hose hydrant in the ISFSI yard. The work was completed on December 6, 2004. Additionally, cold weather preparations for snow and ice removal were in place including support equipment.

5.3 Conclusions

The licensee conducted annual cold weather inspections and walk-downs in accordance with maintenance work order instructions.

6 Decommissioning Performance and Status Review at Permanently Shutdown Reactors (71801)

6.1 Inspection Scope

The inspectors evaluated whether the licensee and its contracted workforce were conducting decommissioning activities in accordance with license and regulatory requirements.

6.2 Observations and Findings

Plant tours were conducted to observe status of decommissioning. Portions of the site tours included the State of Oregon's Trojan Resident Engineer and two Oregon Energy Siting Council members. The inspectors conducted radiological surveys of ambient gamma exposure rates inside and around the former plant, in part, to ensure that all residual radioactive materials had been removed. The inspectors conducted these radiological surveys using Ludlum Model 2401-P and Model 19 survey meters. The site tours confirmed that all radioactive material had been removed, with the exception of several sealed sources. Radiological controls, including postings and barriers, had been

removed from all areas except those in the immediate vicinity of the remaining sealed sources. There were no remaining containers of radioactive waste staged for disposal or transfer to other licensees.

At the time of the inspection, the licensee possessed about 15 sealed sources, including 6 generally licensed sources and 3 exempt quantity sources. Two sources in a cesium-137 calibration unit were transported offsite during the inspection. Another source, a curium-244 source, was expected to be transferred to the Department of Energy in the near future. The licensee planned to transfer all remaining sealed sources prior to termination of the 10 CFR Part 50 license.

6.3 Conclusion

Site tours confirmed that all remaining radioactive material had been removed from the plant with the exception of several sealed sources. All radiation protection postings had been removed except for those in the immediate vicinity of the sealed sources. The licensee planned to transfer all remaining sealed sources in the near future to authorized recipients.

7 **Occupational Radiation Exposure (83750)**

7.1 Inspection Scope

The licensee's personnel radiation monitoring program was inspected for compliance with applicable requirements and commitments.

7.2 Observations and Findings

The inspectors reviewed the personnel dosimetry records for 2004. The records consisted of external exposures only. Although the licensee experienced a few minor skin contamination events during 2004, none of the events resulted in an assignment of internal dose.

During 2004, the licensee monitored 134 site workers. Based on the licensee's records, the highest total effective dose equivalent for 2004 was 11 millirems. For comparison, the highest total effective dose equivalent for 2003 was 949 millirems, while the highest dose for 2002 was 169 millirems. (This higher exposure for 2003 was expected due to the loading of spent fuel into canisters for transfer to the ISFSI.) In summary, all occupational exposures for the last three years were below the 5000-millirem annual total effective dose equivalent limit established in 10 CFR Part 20.

The licensee recently discontinued radiological monitoring of workers entering the former Trojan plant. The licensee continued to monitor workers who entered the radiological restricted area of the ISFSI. The ISFSI workers were monitored for external exposures only.

7.3 Conclusions

The licensee continued to maintain an effective program for monitoring occupational radiation exposures. Occupational exposures for calendar year 2004 were small fractions of the regulatory limits.

8 **Inspection of Final Surveys at Permanently Shutdown Reactors (83801)**

8.1 Inspection Scope

The inspectors reviewed the licensee's final status survey activities to determine compliance with Decommissioning Plan requirements.

8.2 Observations and Findings

The inspectors reviewed Final Status Survey (FSS) release records supporting the FSS reports for the Spent Fuel Systems, Auxiliary Building Interior, Fuel Building Interior and Support Facilities and Site Grounds. The review included both the administrative and technical portions of the FSS records. Prior to the inspection, the staff reviewed the final survey results for all survey units associated with each of the areas identified above.

Due to the large number of FSS release records associated with each FSS area, the staff selected a biased sample of FSS release records for review during the inspection. The following table identifies the number of FSS release records reviewed in each FSS area:

FSS Area / # of Survey Units	# of FSS Release Records Reviewed / % of Total
Spent Fuel Systems / 15 survey units - 15 Class 1 survey units	15 records reviewed / 100%
Auxiliary Building Interior / 144 survey units - 86 Class 1 survey units - 58 Class 2 survey units - 0 Class 3 survey units	38 records reviewed / 27% - 26 Class 1 records / 30% - 12 Class 2 records / 20%
Fuel Building Interior / 82 survey units - 34 Class 1 survey units - 30 Class 2 survey units - 18 Class 3 survey units	25 records reviewed / 30% - 12 Class 1 records / 33% - 10 Class 2 records / 33% - 3 Class 3 records / 16%
Support Facilities & Site Grounds / 74 survey units - 8 Class 1 survey units - 12 Class 2 survey units - 54 Class 3 survey units	20 records reviewed / 30% - 8 Class 1 records / 100% - 6 Class 2 records / 50% - 6 Class 3 records / 10%

Overall, the inspectors found the records to be comprehensive and compliant with the Trojan License Termination Plan and NRC requirements. In response to NRC staff comments, Trojan personnel provided three memorandums clarifying minor issues

which resulted in more complete FSS release records. These minor issues included procedure clarification for chain of custody of smear samples, embedded pipe survey results, and clarification of a scan result for a wall penetration. In addition, the inspectors recommended that copies of the gamma survey records be included into the Auxiliary Building Interior FSS release records, as was done with the FSS release records for other areas.

In response to a question from Oregon Department of Energy's Trojan Resident Engineer, the staff also reviewed the following documents regarding the applicability to the Trojan License Termination Plan and FSS measurements:

- PGE- Trojan FSS Calculation 2003-07, Revision 0, dated Nov. 16, 2003, "Survey Unit Sizes for MDC Scan Values Exceeding Auxiliary Building Gross Activity Derived Concentration Guideline Level." This calculation addressed the minimum detectable concentration scan values for the Ludlum 44-9 GM probe (15cm²).
- PGE - Trojan Final Survey Calculation 2003-03, Revision 0, dated April 21, 2003, "Final Survey Technical Basis Document - Site Specific Scabbled Concrete Source Efficiency Factor (E_s)." This Oregon State University study established the site specific E_s values for scabbled concrete.

Following these reviews, the inspectors concluded that the documents' conclusions were adequately supported and justified.

8.3 Conclusions

The review of the licensee's final status survey records indicated that the documents had been developed in accordance with procedural requirements. The records indicate that the remaining residual radioactive material in the plant is less than the respective derived concentration guideline levels. The NRC's conclusions of the final status survey reports will be presented to the licensee under separate correspondence .

9 **Radioactive Waste Treatment, and Effluent and Environmental Monitoring (84750)**

9.1 Inspection Scope

The inspectors reviewed the licensee's program to control, monitor, and quantify releases of radioactive materials to the environment in liquid, gaseous, and particulate forms.

9.2 Observations and Findings

The radioactive effluent release program was previously described in the Offsite Dose Calculation Manual. The licensee's records indicate that 26 liquid discharges occurred during 2004. The last liquid release occurred on October 7, 2004. The inspectors reviewed the raw data for 2004 and noted that liquid releases were less than 3 percent of the applicable effluent concentration limits.

Gaseous releases were discontinued during 2004. Auxiliary Building exhaust sampling, utilizing permanent plant equipment, was discontinued during January 2004. The licensee continued to sample the Auxiliary Building releases via temporary sampling equipment until October 7, 2004. Condensate Demin Building sampling, location where radwaste handling operations had occurred, was discontinued during July 2004 when the building was cleared of radioactive material. Based on a review of the raw data, the gaseous effluent sample results for 2004 were less than 1 percent of the Offsite Dose Calculation Manual limits. The results for 2004 will be tabulated in the annual report which is expected to be submitted to the NRC during February 2005.

The radiological environmental monitoring program is used to monitor the radiation and radionuclides in the environs of the facility and was described in the Offsite Dose Calculation Manual. The licensee planned to implement the environmental monitoring program until the 10 CFR Part 50 license is terminated. The program currently consisted of ambient gamma radiation level, surface water, and shoreline sediment sampling. The inspectors reviewed the raw data for 2004 and confirmed that the sample results were at background levels. The results for 2004 will be formally submitted to the NRC in the annual report.

9.3 Conclusions

The licensee had established and implemented the radioactive liquid, gaseous effluent, and radioactive environmental monitoring programs. The licensee discontinued the liquid and gaseous effluent sampling programs during 2004. No sample result exceeded any license or regulatory limit, and no adverse trends were identified.

10 **Solid Radioactive Waste Management and Transportation of Radioactive Materials (86750)**

10.1 Inspection Scope

The licensee's program for properly processing, packaging, storing, and shipping radioactive materials was reviewed for compliance with regulatory and procedural requirements.

10.2 Observations and Findings

At the time of this inspection, there was no radioactive waste onsite. The last shipment left the site on December 16, 2004. This shipment consisted of two drums of miscellaneous wastes for disposal at a licensed waste disposal facility in Washington state. The licensee planned to include summary information of the solid waste shipments in the 2004 annual report, expected to be submitted to the NRC during February 2005.

The inspectors reviewed the shipping papers for the final shipment, No. 2004-49. The records indicated that the shipment was conducted in accordance with the licensee's procedure requirements. The shipping papers included the waste manifest, emergency instructions, and vehicle surveys.

10.3 Conclusions

The licensee shipped dry radioactive wastes in accordance with procedural requirements. Shipping records were thorough and complete.

11 **Followup (92701)**

- 11.1 (Closed) Inspection Followup Item 072-00017/0401-01: The implementing procedure for ISFSI radiological environmental monitoring program did not include an acceptance criteria for evaluating TLD results.

The licensee had established Procedure TIP 14, "Radiological Effluent Control Program and Radiological Environmental Monitoring Program" for use in conducting environmental monitoring. Procedure TIP 14, at the time of the previous inspection, did not include acceptance criteria for evaluating TLD results.

During the current inspection, the inspectors reviewed the updated version of TIP 14 (Revision 3). This version included acceptance criteria for the 16 ISFSI environmental TLDs. The acceptance criteria was derived from Holtec Report HI-2012749. The acceptance criteria varied from 5 to 864 millirems per quarter, depending on location of the TLD. The inspectors reviewed the environmental TLD results for 2004 and noted that none of the results exceeded the associated acceptance criteria.

12 **Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the exit meeting on January 27, 2005. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.

ATTACHMENT

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Fischer, ISFSI Manager
S. Ford, Licensing Engineer
T. Meek, Radiation Protection Manager
S. Nichols, General Manager
J. Reid, Licensing and Plant Support Manager
J. Vingerud, Decommissioning Manager
J. Westvold, Nuclear Oversight Manager

State of Oregon

A. Bless, Trojan Resident Engineer, Oregon Department of Energy
L. Brogoitti, Oregon Energy Siting Council
M. Dibblee, Oregon Energy Siting Council

INSPECTION PROCEDURES USED

IP 36801	Organization, Management, and Cost Controls at Permanently Shutdown Reactors
IP 37801	Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors
IP 40801	Self Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors
IP 60855	Operation of an ISFSI
IP 71714	Cold Weather Preparations
IP 71801	Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 83750	Occupational Radiation Exposure
IP 83801	Inspection of Final Surveys at Permanently Shutdown Reactors
IP 84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring
IP 86750	Solid Radioactive Waste Management and Transportation of Radioactive Materials
IP 92701	Followup

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Discussed

None.

Closed

072-00017/0401-01	IFI	The implementation procedure for the ISFSI radiological environmental monitoring program did not include an acceptance criteria for evaluating TLD results
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LIST OF ACRONYMS

FSS	final status survey
IFI	Inspection Followup Item
ISFSI	Independent Spent Fuel Storage Installation
NRC	Nuclear Regulatory Commission
QA	quality assurance
SAR	Safety Analysis Report
TLD	thermoluminescent dosimeter