



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
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ARLINGTON, TEXAS 76011-4005

April 16, 2004

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

SUBJECT: NRC INSPECTION REPORT 050-00344/04-001 AND 072-00017/04-001

Dear Mr. Quennoz:

An NRC inspection was conducted on March 1-4, 2004, at your Trojan Nuclear Plant facility. On March 4, 2004, at the conclusion of the inspection, an exit briefing was conducted with Mr. Steve Nichols, General Manager, and other members of your staff. Subsequent to the site visit on April 1, 2004, a final telephonic exit interview was conducted between the lead inspector and Mr. Nichols. The enclosed report presents the scope and results of that inspection.

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. Within these areas, the inspection included reviews of revisions to your safety review program, safety reviews of decommissioning work packages and procedures, operation of the Independent Spent Fuel Storage Installation (ISFSI) facility, audits and surveillances, organizational changes, decommissioning status, and occupational radiation exposure. One unresolved item was identified which related to the implementation of your change review process conducted pursuant to 10 CFR Part 50.59. An unresolved item is an item for which, at the time of the inspection, there was not sufficient information to determine if a violation had occurred. Resolution of this item will be determined by the NRC and no information or response is requested from you at this time.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Portland General Electric Company

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Should you have any questions concerning this inspection, please contact the undersigned at (817) 860-8191 or Emilio M. Garcia at (530) 756-3910.

Sincerely,

/RA/

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

Docket Nos.: 050-344; 072-17
License Nos.: NFP-1, SNM-2509

Enclosure:
NRC Inspection Report
050-00133/03-004; 072-00017/04-001

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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.: 050-00344/04-001; 072-00017/04-001

Licensee: Portland General Electric Company

Facility: Trojan Nuclear Plant

Location: 71760 Columbia River Highway
Rainier, Oregon 97048

Dates: March 1 - April 1, 2004

Inspectors: Emilio M. Garcia, Health Physics Inspector
Ray L. Kellar, P.E., Health Physics Inspector-In-Training

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

Attachments: Supplemental Inspection Information
Partial List of Documents Reviewed

ADAMS Entry: IR 05000344-04-01 and 07200017-04-01 on 03/01-04/01/2004;
Portland General Electric Co.; Trojan Nuclear Plant;
Decommissioning Report; 1 unresolved item.

EXECUTIVE SUMMARY

Trojan Nuclear Plant
NRC Inspection Report 050-00344/04-001; 072-00017/04-001

The inspectors reviewed the licensee's implementation of safety reviews, design changes, and modifications; operation of Independent Spent Fuel Storage Installation (ISFSI); maintenance activities, decommissioning performance; and occupational radiation exposure. In summary, the licensee was conducting decommissioning activities and ISFSI operations in accordance with regulatory and license requirements.

Safety Reviews, Design Changes, and Modifications

- An unresolved item was identified which related to the implementation of the licensee's change review process conducted pursuant to 10 CFR Part 50.59 (Section 1).
- The decommissioning packages reviewed contained safety reviews conducted in accordance with licensee procedures prior to commencing work activities (Section 1).
- With the planned licensee termination in June 2005 the licensee had elected to eliminate periodic refresher training for safety reviewers. The licensee's training program provided personnel preparing, reviewing, and approving safety evaluations with training meeting regulatory requirements (Section 1).

Operation of an Independent Spent Fuel Storage Installation

- The licensee's ISFSI safety review process was conducted in accordance with Trojan procedures and 10 CFR Part 72 guidance (Section 2).
- ISFSI operations observed were being conducted in accordance with applicable requirements (Section 2).
- The licensee's quality oversight of the ISFSI and related activities were comprehensive and thorough (Section 2).
- The licensee submitted required reports for 2002 and 2003 related to the ISFSI. The reports contained all information required and were submitted in a timely manner (Section 2).
- An inspection followup item was opened regarding the implementing procedure for the ISFSI radiological environmental monitoring program not including an acceptance criteria for evaluating results (Section 2).

Maintenance and Surveillances

- Minimal maintenance or surveillance activities were required by the licensee due to the advanced stage of plant decommissioning. The maintenance work package documentation reviewed by the inspectors met requirements (Section 3).

Decommissioning Performance and Status Review

- The licensee was conducting decommissioning activities in a safe and thorough manner. Personnel interviewed were knowledgeable and were performing work in accordance with approved procedures (Section 4).
- Plant staffing met requirements and was adequate for oversight of decommissioning activities (Section 4).
- A limited review of the fire protection program found that the portions reviewed met requirements (Section 4).

Occupational Radiation Exposure

- The audit and surveillances reviewed were performance-based. The auditors were trained and qualified as audit team leaders and the overall quality of the audits and surveillances was very good (Section 5).
- The licensee intended to substantially reduce or eliminate radiation protection programs, procedures and instrumentation that were no longer needed. Since the facility was in an advanced state of decommissioning, the inspectors concluded that these changes were reasonable and appropriate (Section 5).
- The licensee was maintaining an effective program to monitor occupational radiation exposures, including a declared pregnant worker. Occupational exposures for calendar year 2003 were below regulatory limits. Required reports had been submitted on a timely basis and included all the required information (Section 5).

Report Details

Summary of Plant Status

On September 3, 2003, the licensee completed the transfer of all fuel from the spent fuel pool (SFP) to its Independent Spent Fuel Storage Installation (ISFSI). The relocation of all fuel from the SFP to the ISFSI signified that the fuel has been transferred from the licensee's 10 CFR Part 50 license to its 10 CFR Part 72 license. The ISFSI was fully operational and contained 34 loaded casks.

The SFP liner had been completely removed and decontamination of the fuel transfer canal and cask load pit had been completed by the time of this inspection. Major activities in progress during the inspection included decontamination of the concrete floor and walls underneath where the former SFP liner had been located and the performance of final radiation status surveys in the auxiliary building. Currently, the licensee plans to complete final status surveys by October 2004 and the decommissioning project by June 2005.

1 Safety Reviews, Design Changes, and Modifications (IP 37801)

1.1 Inspection Scope

The inspectors reviewed changes to the Trojan safety review program affecting the ongoing decommissioning activities. To evaluate the effectiveness of the program changes since defueling completion, the inspectors also reviewed the completed safety reviews associated with two recent decommissioning work packages and the current safety review training program.

1.2 Observations and Findings

a. Safety Review Process

Following removal of all the spent fuel to the ISFSI on September 3, 2003, the licensee implemented Amendment 205 of the Trojan Facility Operating License. This license amendment transferred the administrative control requirements contained in Section 5.5 of the operating license to PGE-8010, "Trojan Nuclear Plant Quality Assurance Program." Section 5.5 of the license contained, among other items, requirements for the conduct of independent safety reviews and for the Independent Review and Audit Committee (IRAC). After all the spent fuel had been moved to the ISFSI and there was no longer any safety related equipment in use, the licensee eliminated the requirement for the Trojan Nuclear Plant Independent Review and Audit Committee that was responsible to provide independent review and audit of designated activities.

After elimination of the Independent Review and Audit Committee on September 4, 2003, the Independent Safety Reviews were accomplished in accordance with Appendix C of PGE-8010, "Trojan Nuclear Plant Nuclear Quality Assurance Program" Revision 26. Section 1.3.1 of PGE-8010 required that safety reviews be reviewed by a

qualified Independent Safety Reviewer. The implementation details of the safety review program are located in procedure TPP 18-1, "10 CFR 50.59 and Other Regulatory Evaluations."

The inspectors reviewed Trojan Nuclear Plant procedures that implemented the safety review program. Procedure TPP 18-1, "10 CFR 50.59 and Other Regulatory Evaluations," Revision 19, contains instructions, screening checklists and program evaluations for use during performance of safety reviews. The screening checklist contained in TPP 18-1, no longer contained a 10 CFR 50.59 screening question. The licensee had performed a 10 CFR 50.59 evaluation which concluded that there was no longer a need for the 10 CFR 50.59 screening question in the procedure due to the advanced stage of decommissioning and that there were no remaining activities that could potentially "screen in" requiring a 10 CFR 50.59 evaluation. The TPP 18-1 screening checklist did, however, address programmatic aspects including receipt of prior NRC approval and potential changes to the Trojan license or technical specifications, the Quality Assurance Program, the Offsite Dose Calculation Manual, the Fire Protection Program, the Environmental Protection Plan, Defueled Safety Analysis Report, or License Termination Plan. It was not clear to the inspectors if the licensee had the authority to remove the 10 CFR 50.59 screening questions and potential evaluations from the screening checklist contained in the Trojan safety review process. This matter was identified as an unresolved item (URI) pending further evaluation by the NRC staff (URI 50-00344/0401-001). An unresolved item is an item for which there is not sufficient information at the time of the inspection to determine if the matter is a violation or not.

Procedure TPP 10-9, "Trojan Nuclear Plant Independent Safety Reviewer Charter," contained requirements and qualifications for the Independent Safety Reviewer performing Trojan reviews. The inspectors reviewed the contents of this procedure and the qualifications of two randomly selected Trojan Independent Safety Reviewers as compared to the requirements listed in TPP 10-9. The procedure content and qualifications of the selected Independent Safety Reviewers met licensee commitments.

b. Design Changes and Modifications

Two work packages were selected and reviewed by the inspectors that implemented modifications to systems that were screened by the licensee's safety review process. The first package reviewed was defueled plant modification Request 2003-001, Revision 2, for removal of the radwaste discharge line to the discharge and dilution structure. This modification request removed process effluent radiation monitor Number 9, deactivated the existing storage tanks and installed new receiving and discharge tanks at a different location, after the disposal of all the water from the spent fuel pool that was completed in September 2003. The safety review screening checklist associated with Revision 1 of the modification request, correctly identified a potential change to the Offsite Dose Calculation Manual and Defueled Safety Analysis Report describing process effluent radiation monitor Number 9. The associated radiological effluent controls program evaluation Number 2003-012 approving the

removal of process effluent radiation monitor Number 9 was processed and reviewed by the licensee in accordance with the requirements of Trojan procedure TPP 18-1, "10 CFR 50.59 and Other Regulatory Evaluations." As required by TPP 18-1, license document change Request 2003-42, was prepared to document the removal of process effluent radiation monitor Number 9 and utilized to revise the Offsite Dose Calculation Manual and Defueled Safety Analysis report. The license document change request was approved by the licensee organization on February 5, 2004.

The inspectors also reviewed a work package that affected the Trojan fire protection system. The licensee provided a draft maintenance Request (MR) 33747, "Deactivate Power Block Fire Protection (Loop 3)," for the inspectors' review that had undergone all but the final approval signature. The maintenance request included a completed safety review screening checklist and a fire protection exemption/evaluation sheet. There were no potential adverse consequences identified in the reviews. The inspectors concluded that the safety reviews were conducted in accordance with licensee procedures prior to commencing work activities.

c. Training

The licensee maintained a list of all qualified personnel for performing safety evaluations and reviews pursuant to 10 CFR 50.59, and the date of the last refresher training course completed for each individual. Due to the advanced decommissioning status of the Trojan plant, the licensee removed the periodic safety review training refresher course requirement in Revision 19 to TPP 18-1, "10 CFR 50.59 and Other Regulatory Evaluations." The last refresher course attended by the qualified 10 CFR 50.59 review personnel was conducted in 2002. The personnel performing the evaluations and reviews on several selected licensee screening checklists/evaluation were compared to the licensee's list of qualified individuals to ensure that the selected safety reviewers were indeed qualified. All the individuals performing the selected screenings and evaluations reviewed by the inspectors had received the required safety review refresher training conducted during 2002. The inspectors concluded that the licensee's training program provided personnel preparing, reviewing, and approving safety evaluations with training meeting applicable requirements.

1.3 Conclusions

An unresolved item was identified which related to the implementation of the licensee's change review process conducted pursuant to 10 CFR Part 50.59

The decommissioning packages reviewed contained safety reviews conducted in accordance with licensee procedures prior to commencing work activities.

With the planned licensee termination in June 2005 the licensee had elected to eliminate periodic refresher training for safety reviewers. The licensee's training program provided personnel preparing, reviewing, and approving safety evaluations with training meeting regulatory requirements.

2 Operation of an Independent Spent Fuel Storage Installation (IP 60855)

2.1 Inspection Scope

The inspectors reviewed the licensee's 10 CFR Part 72 safety review program, routine activities conducted by the licensee, recently conducted quality assurance audits and surveillances, and ISFSI environmental records.

2.2 Observations and Findings

a. Safety Review Process

The inspectors reviewed the licensee's safety review process for the storage of dry spent fuel (10 CFR Part 72 requirements) and three recently conducted safety reviews for procedural changes that were implemented by the licensee during the past 6 months. The inspectors also reviewed the minutes from recent ISFSI Safety Review Committee (ISRC) meetings and ISRC training/qualification requirements for three selected individuals.

The Trojan safety review process implementation instructions were found in TIP 05, "10 CFR 72.48 and Other Regulatory Evaluations." Included as attachments to the procedure were detailed instructions that provided the safety reviewer guidance in answering the screening checklist and 10 CFR 72.48 evaluation form. Three selected safety review screening checklists that were performed in accordance with the requirements of TIP 05, were reviewed and found to conform with procedural requirements. The safety reviews were associated with the following procedure revisions:

- Revision 1 to TIP 05, "10 CFR 72.48 and Other Regulatory Evaluations"
- Revision 2 to TIP 01, "Trojan ISFSI Management Organization and Responsibility"
- Revision 1 to TIP 41, "Certified ISFSI Specialist Training"

The inspectors reviewed the requirements contained in TIP 02, "ISFSI Safety Review Committee Charter," Revision 0, that provided ISFSI Safety Review Committee requirements. The ISRC responsibilities delineated by procedure included review and audit of safety related documents and activities, and reporting any safety significant disagreement between the ISRC and the ISFSI Manager to the Corporate Executive within 24 hours. TIP 02 provided minimum meeting composition requirements for a quorum as well as minimum standards for training and experience. The minutes of three randomly selected ISRC meetings conducted during 2003 were reviewed by the inspectors to ensure that a quorum was present. Meeting minutes indicated that a total of eight ISRC meetings had been held during 2003 and that the three selected meetings all had a quorum present. The training and qualification records of four randomly selected ISRC members were reviewed and found to meet or exceed procedural requirements.

The licensee's ISFSI safety review process was conducted in accordance with Trojan procedures and 10 CFR 72 guidance.

b. Routine Activities

The inspectors toured the ISFSI area and witnessed the performance of selected portions of routine daily and weekly surveillance activities performed by the ISFSI Specialist. The inspectors also reviewed ISFSI surveillance procedures and selected records provided by the licensee.

Trojan ISFSI Technical Specification 5.5.3.a. required that the air outlet temperature of the concrete casks and ambient air temperature be measured, the difference between the two readings calculated and recorded daily. Additionally, the air inlet vents are required to be inspected and verified free of blockage weekly. During the ISFSI tour, 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. The specialist also simulated how readings were performed in the event of a failure of the Fluke data logger by utilization of a handheld digital temperature recorder, the OMEGA model 450 APT platinum thermometer. During performance of the simulation, the first OMEGA Model 450 APT platinum thermometer failed to function correctly. The ISFSI Specialist utilized a spare OMEGA thermometer to perform the simulated temperature readings. The non-functional OMEGA thermometer was taken out-of-service until necessary repairs could be completed. Calibration stickers located on the Fluke data logger and both of the OMEGA platinum thermometers were verified by the inspectors to be current. The temperature readings obtained from the Fluke data logger and the OMEGA thermometer were in close agreement when compared with each other. The ISFSI Specialist was knowledgeable of the procedure requirements and use of the temperature measuring equipment.

The inspectors reviewed two licensee procedures that provided instructions for performance of ISFSI Technical Specification 5.5.3.a surveillance requirements along with supporting data. Procedure TIP 17, "Concrete Cask Thermal Monitoring Program," Revision 3, and temperature logs obtained from the Fluke Model 2286A data logger were reviewed for the selected periods of February 18-20, 2004. The licensee recorded the concrete cask air outlet temperatures twice per each 24-hour period. All the data and the completed forms reviewed were prepared in accordance with procedural requirements as specified in TIP 17, "Concrete Cask Thermal Monitoring Program." The licensee recorded the daily temperature readings for each cask and plotted the temperature readings for each air outlet location along with the ambient temperature readings on a graph. The inspectors reviewed these graphs for the period of January 12 through February 11, 2004, and found that the temperature readings were within expected ranges. Trojan Procedure TIP 12, "Monitoring of the Concrete Cask System," Revision 5, provided inspection instructions for potential foreign objects that could block the air inlets or outlets of the concrete casks, and for measurement of radiation levels to ensure that no abnormal radiation levels were present. Procedure TIP 12 and the inspection results conducted by the licensee on February 29, 2004, were reviewed by the inspectors. The licensee inspection results

indicated unobstructed concrete cask air inlet and outlet vents with no abnormal radiation levels detected. The inspectors concluded that the licensee was meeting the requirements of ISFSI Technical Specification 5.5.3.a.

The inspectors also reviewed Trojan procedure TIP 09, "Structural Inspection Program," Revision 2, that established periodic inspection requirements for the concrete casks to ensure structural integrity was maintained. Acceptance criteria for the concrete casks concluded that no reinforcing steel was exposed and that any noted defects on the concrete cask surface did not contribute to a contact radiation dose rate (gamma plus neutron) of more than 150 percent of the contact radiation dose rate of adjacent unaffected areas. Should either of the above acceptance criteria not be met, then repairs of defect areas would be required. At the time of the inspection, the licensee had inspected 10 of the loaded concrete casks. The inspectors selected the results of two completed concrete casks packages to review. The first concrete cask data package reviewed was Serial Number PCC-12 that was inspected by the licensee on January 30, 2004. A small area on the concrete cask surface was identified as a defect (approximately one-half inch in diameter and one-quarter inch deep) that did not extend into the reinforcing steel. In accordance with TIP 09 requirements, the area of the defect and the adjacent area of the concrete cask were surveyed for an increased dose rate. No dose rate deviations were noted by the licensee's inspection report. The defect met the licensee acceptance criteria specified above from procedure TIP 09, and no repairs were required. The licensee is currently investigating a cosmetic repair method for the localized defect to minimize the potential of defect growth. The second concrete cask data package reviewed was Serial Number PCC-03 and was inspected by the licensee on December 17, 2003. There were no defects noted during the inspection by the licensee. The air inlet frames and anchors of both concrete casks were inspected against the design criteria located on drawing NQI81106-4A, Revision 00, with no noted defects.

Licensee procedure ONI 72-03, "Response to Natural Phenomena Events," Revision 0, provided instructions to be performed during off-normal ISFSI events. Natural events discussed in the procedure included earthquake, flooding, volcanic eruption, severe weather, snow accumulation, or freezing rain. Section 7.0 of ONI 72-03 provided instructions for recovery of snow accumulation greater than 1-inch. Beginning at 5:30 a.m. on January 6, 2004, and ending at 6:00 a.m. on January 10, 2004, snowfall accumulated to a depth of 1 inch or greater at the licensee ISFSI. The daily activity reports were reviewed by the inspectors for the time period of January 6-10, 2004, to ensure that required licensee actions had been taken. The daily activity reports indicated that the crews maintained temperature monitoring every 2 hours as required by ONI 72-03 and had expended substantial efforts in keeping the snow and ice accumulations from restricting the air inlet vents.

The inspectors concluded that ISFSI operations observed were being conducted in accordance with the NRC licensee and licensee procedures.

c. QA Audits and Surveillances

The licensee had developed a comprehensive list of integrated audit and surveillances that were performed on ISFSI related activities. The licensee's quality assurance (QA) organization had also developed a comprehensive checklist of specific fuel loading activities, spent fuel pool control activities, ISFSI operational activities, and general/programmatic ISFSI loading and operational activities to be observed during the movement of spent fuel to the ISFSI. The most recent QA audit had been completed between June 16 - September 11, 2003. The inspectors reviewed the results of the most recent QA audit and two selected ISFSI surveillances conducted during 2003.

QA Audit AP-I-002 was conducted to assess the effectiveness of the implementation of Trojan ISFSI activities. The audit was conducted utilizing performance-based and compliance-based techniques. The audit concluded that, "Overall the ISFSI activities that were evaluated during the audit were determined to satisfactory implement and comply with the Trojan Nuclear Quality Assurance Program and the ISFSI Technical Specifications." The audit identified one finding related to adequate evaluation and documentation of transfer cask training operations for the ISFSI Specialist personnel. Additionally, there were three minor recommendations included in the audit along with one area listed as a strength related to welding activities.

The inspectors also reviewed the results of two selected ISFSI/Spent Fuel Pool Weekly Surveillances that were performed on July 14-20 and July 28 - August 3, 2003. The surveillances reported that the ISFSI loading and storage activities observed were found in compliance with technical specifications and procedural requirements. Neither of the surveillances identified any findings, observations or recommendations. The next scheduled ISFSI QA audit is planned for the third quarter of 2004. The inspectors concluded that the licensee conducted quality oversight of the ISFSI and related activities were comprehensive and thorough.

d. Radiological Effluent Release Reports

The Trojan ISFSI Technical Specification 5.5.2.c and 10 CFR 72.44(d)(3) require that an annual report be submitted to the Commission 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 and such other information as may be required by the Commission to estimate maximum potential radiation dose commitment to the public resulting from effluent releases. The report must be submitted within 60 days after the end of the 12-month monitoring period.

The licensee submitted the required reports for 2002 and 2003 on a timely basis. Since the Trojan ISFSI is by design a sealed system, no gaseous or liquid effluents were produced.

e. Radiological Environmental Monitoring Program

The Trojan ISFSI Technical Specification 5.5.2.b states that the Radioactive Effluent Control Program includes an environmental monitoring program. The environmental monitoring program ensures the annual dose equivalent to any real individual located outside the ISFSI Controlled Area does not exceed regulatory limits.

This technical specification is implemented by Trojan ISFSI Procedure TIP 14, "Trojan ISFSI Radioactive Effluent Control Program and Radiological Environmental Monitoring Program." Section 6.2.1 of TIP 14, describes the Radiological Environmental Monitoring Program as consisting of a minimum of eight area monitoring TLD locations near the storage casks and a minimum of eight area monitoring TLD locations near the Controlled Area perimeter. Section 6.2.6 requires that the environmental monitoring results be reviewed to determine if any results are higher than expected. The procedure however does not include any acceptance criteria.

The licensee had started collecting data for the locations near the storage casks once all the casks were loaded in the fourth quarter 2003. For the locations near the Controlled Area the licensee had collected data from the fourth quarter of 2002, but only at seven locations. The inspectors noted that the previous revision to TIP 14 required a minimum of seven area monitoring TLD locations, and that due to terrestrial constraints, Locations 1, 6, and 7, were significantly closer to the ISFSI than the Controlled Area perimeter. In the first quarter 2004 the licensee added a new location in the outer ring of monitors, Location 16, which is approximately 33 meters from the ISFSI. Table 1 below list the TLD monitoring result for locations near the Controlled Area perimeter. These results had not been corrected for background.

Table 1
Trojan ISFSI Environmental TLD Results in Rem
for Locations near the Controlled Area Perimeter

Location	1	2	3	4	5	6	7
~ Distance from ISFSI	260 meters	300 meters	300 meters	300 meters	300 meters	Not Available	64 meters
1 QT 2003	0.013	0.005	0.008	0.006	0.005	0.005	0.013
2 QT 2003	0.009	0.007	0.004	0.006	0.005	0.005	0.026
3 QT 2003	0.005	0.003	0.003	0.003	0.002	0.011	0.056
4 QT 2003	0.012	0.009	0.007	0.007	0.007	0.022	0.073
2003 Totals	0.039	0.024	0.022	0.022	0.019	0.043	0.168

There are two regulatory limits of annual dose equivalent to any real individual located outside the ISFSI Controlled Area that are relevant. 10 CFR 20.1301(a)(1) specified that the total effective dose equivalent to individual members of the public from licensed operations shall not exceed 0.1 rem in a year exclusive from background

radiation. The second relevant regulation is 10 CFR 72.104(a) that stated in part that during normal operations and anticipated occurrences, the annual dose equivalent to any real individual who is located beyond the controlled area boundary must not exceed 25 millirem (or 0.025 rem) to the whole body.

Although other surveys performed by the licensee demonstrated that the limits of 10 CFR 20.1301(a)(1) and 10 CFR 72.104(a) were not exceeded, the licensee had specifically established Procedure TIP 14 to demonstrate that the annual dose equivalent to any real individual located outside the ISFSI Controlled Area does not exceed regulatory limits. The effective revision of Procedure TIP 14, at the time of the inspection, did not achieve this goal. The licensee stated that they would review and revise as necessary Procedure TIP 14 to include an acceptance criteria for evaluating radiological environmental monitoring results. The inspectors will review the licensee actions regarding this matter in a future inspection (IFI 72-017/0401-01).

f. ISFSI Contents Summary and Certificate Holder Records

A summary of the spent fuel characteristics and the Holtec canisters loaded at the Trojan ISFSI is included as Attachment 3 to this report. Records maintained by the licensee identified six multi-purpose canisters (MPC) containing failed fuel cans (FFC) and one MPC with a damaged fuel container (DFC). Damaged Fuel Assemblies that could be handled by normal means were stored in either a FFC or a DFC, before being stored in an MPC. Fuel debris were classified as fuel that could not be handled by normal means and included loose fuel pellets and fragments and portions of fuel rods and grid assemblies. Fuel debris were stored in Process Cans or directly in a FFC depending upon the extent of damage. Process Cans were containers that were utilized to process fuel debris to remove organic contaminants and for storage. Process Cans were stored in Process Can Capsules with some exceptions. Process Can Capsules contained five Process Cans. Process Can Capsules were stored in FFC before insertion into an MPC. Table 2 summarizes the storage of damaged or failed fuel at the Trojan ISFSI.

Table 2
Trojan ISFSI Storage of Damaged or Failed Fuel

HOLTEC MPC No.	MPC Type	CONCRETE CASK No.	ISFSI LOCATION	FFC No.	MPC Cell	Assembly No.	Contents
19	E	PCC-27	W25	13	B2	A45	165 rods
				20	E5	B22	Skeleton, no fuel rods
27	E	PCC-25	W22	DFC	B2	C18	Intact Assembly with 1 missing rod
29	EF	PCC-18	E35	1	B2	-	Process Can Capsule 07
				12	B5	-	Process Can Capsule 08
				18	E2	-	Process Can Capsule 09
				15	E5	-	Process Can Capsule 10

HOLTEC MPC No.	MPC Type	CONCRETE CASK No.	ISFSI LOCATION	FFC No.	MPC Cell	Assembly No.	Contents
30	EF	PCC-13	E23	1	B2	F18	
				2	B5	F19	
				3	E2	F56	
				4	E5	F07	
31	EF	PCC-14	E24	6	B2	F04	
				16	B5	F02	
				17	E2	F03	
				19	E5	F05	
32	EF	PCC-15	E25	10	B2	-	Process Can Capsule 02
				8	B5	-	Process Can Capsule 03
				9	E2	-	Process Can Capsule 04
				7	E5	-	Process Can Capsule 06
33	EF	PCC-34	W23	5	B2		Fuel rod storage rack 1
				23	B5	D38	
				22	E2	-	Process Cans 4 & 9 and 8 Bottom Nozzles

10 CFR 72.234, specifies in part, certain records that the certificate holder must establish, maintain, and provide to the user of each spent fuel storage cask. At Trojan there is no certificate holder since the concrete casks were designed, and fabricated by one vendor and the stainless steel canisters (MPCs) were designed and fabricated by another vendor. The licensee had not received all the information listed in 10 CFR 72.234(d) for either the casks or canisters. Information not provided to the licensee included: the dates fabrication was started and completed, a certification that the component was designed, fabricated, tested, and repaired in accordance with a quality assurance program accepted by the NRC, and a certification that inspections required by 10 CFR 72.236(j) were performed and found satisfactory. The licensee stated that the MPC vendor had indicated that they had most if not all of this information but because they were not the certificate holder they had not provided it to the licensee. Since the use of the combination of concrete cask and MPC were reviewed and approved by the NRC Spent Fuel Project Office and the required actions are the responsibility of the Certificate Holder this matter will be referred to the Spent Fuel Project Office for review and resolution.

2.3 Conclusions

The licensee's ISFSI safety review process was conducted in accordance with Trojan procedures and 10 CFR Part 72 guidance.

ISFSI operations observed were being conducted in accordance with applicable requirements.

The licensee's quality oversight of the ISFSI and related activities were comprehensive and thorough.

The licensee submitted required reports for 2002 and 2003 related to the ISFSI. The reports contained all information required and were submitted in a timely manner.

An inspection followup item was open regarding the implementing procedure for the ISFSI radiological environmental monitoring program not including an acceptance criteria for evaluating results.

3 **Maintenance and Surveillances (IP 62801)**

3.1 Inspection Scope

The inspectors evaluated the licensee's maintenance program by reviewing recently completed work order packages.

3.2 Observations and Findings

Due to the advanced stage of decommissioning activities at Trojan, there were no maintenance activities available for the inspectors to observe. Copies of a work orders associated with recently completed maintenance activities on the diesel fire pump engine, K-108 were provided to the inspectors for review. The work orders and associated scope included:

- Work Order 33526 2-year mechanical preventative maintenance
- Work Order 33527 Semi-annual inspection and oil sample
- Work Order 33528 Quarterly inspection
- Work Order 33529 Annual mechanical preventative maintenance
- Work Order 33540 Perform semi-annual mechanical preventative maintenance

The work orders included evidence of adequate pre-job briefings, usage and documentation of calibrated equipment, required safety clearances/equipment tagging, post-maintenance test requirements and inclusion of proper prerequisites. The packages reviewed documented the work activities performed.

3.3 Conclusions:

Minimal maintenance or surveillance activities were required by the licensee due to the advanced stage of plant decommissioning. The maintenance work package documentation reviewed met requirements.

Decommissioning Performance and Status Review (IP 71801)

4.1 Inspection Scope

The inspectors reviewed the status of decommissioning activities and conducted tours of the site to evaluate if facility conditions were effectively controlled.

4.2 Observations and Findings

a. Plant Tours

The inspectors toured the auxiliary building to observe decommissioning activities in progress. The majority of the work activities were located on Elevation 93 of the auxiliary building where the decontamination behind the spent fuel pool liner was in progress. Radiological postings were easily visible and met the requirements in 10 CFR Part 20. Numerous hoses and cords utilized to provide service for various tools were located on the floor of Elevation 93. During the inspection, one of the plant workers experienced a tripping incident on Elevation 93 of the auxiliary building. The licensee took prompt actions to remove all unnecessary hoses/cords and secure any remaining hoses/cords necessary to complete the work to reduce potential tripping hazards.

The inspectors toured the elevations of the auxiliary building that were in the process of receiving final contamination surveys. The final survey of Elevation 25 had been completed. Plant workers were observed on Elevation 5 in various stages of performing the final surveys of that elevation. The instruments utilized were in calibration and the personnel were performing work in accordance with approved procedures.

The inspectors observed the status of permanent plant equipment removal. The licensee had installed a new temporary liquid radwaste system. Work was in progress during the inspection to remove the existing radwaste tanks and piping along with process effluent radiation monitor Number 9. This work was controlled by instructions contained in plant modification Request 2003-001, detailed construction Package 04, Revision 2, for removal of the radwaste discharge line to the discharge and dilution structure. The safety review for this package was reviewed by the inspectors in Section 1 of this report. The inspectors concluded that the decommissioning activities observed were proceeding in a safe and thorough manner.

b. Plant Staffing

The inspectors reviewed the plant staffing requirements as found in PGE-8010, "Portland General Electric (PGE) Nuclear Quality Assurance Program for Trojan Nuclear Plant", Revision 27, and TPP 11-110, "Trojan Organization and Responsibility," Revision 6, against the current Trojan staffing positions. No discrepancies in program staffing requirements were noted. It was noted by the inspectors that some management personnel changed positions. The inspectors attended two daily status report meetings attended by licensee management personnel. Discussions were held on critical path projects, changes to existing programs, safety and other key plant aspects. Open communication was observed between the personnel present at the meetings. The inspectors concluded that the plant staffing requirements met requirements and was adequate for oversight of decommissioning activities.

c. Fire Protection

After final completion of the transfer of the spent fuel to the ISFSI, PGE-1012, "Portland General Electric (PGE) Fire Protection Plan for Trojan Nuclear Plant," was deleted. Letter VPN-038-2003 from Stephen Quennoz to the U.S. Nuclear Regulatory Commission, dated September 4, 2003, provided notice that the elements of the Trojan Nuclear Plant Fire Protection Program would be implemented in TPP 13-7, "Fire Protection Program." The "Fire Protection Program" provided instructions for fire prevention administrative controls; fire prevention, fire suppression and the regulatory basis as derived from 10 CFR 50.48(f) for decommissioning activities. Potential changes to this program were screened in accordance with the requirements of TPP 18-1, "10 CFR 50.59 and Other Regulatory Evaluations."

During a plant tour, the inspectors reviewed the inspection stickers on five randomly selected portable fire extinguishers observed throughout the facility. Gauges on four of these fire extinguishers indicated that they were fully charged and inspection stickers noted that they were within their inspection interval. One portable fire extinguisher had been recently removed from a contaminated area and the inspection sticker noted that it was outside the inspection interval. This portable fire extinguisher was not in use and was marked for decontamination.

The inspectors reviewed Corrective Action Request C-03-0017, that addressed continued compliance with National Fire Protection Association (NFPA) Code requirements. The response to the corrective action request reaffirmed the commitment to meeting 10 CFR 50.48(f) requirements as stated in the "Fire Protection Program."

The corrective action request concluded that the NFPA Code requirements were being adequately addressed by site procedures and maintained through the use of maintenance work instructions. The inspector concluded that portions of the fire protection program reviewed met the requirements for the advanced Trojan decommissioning status.

4.3 Conclusions

The licensee was conducting decommissioning activities in a safe and through manner. Personnel interviewed were knowledgeable and were performing work in accordance with approved procedures.

Plant staffing met requirements and was adequate for oversight of decommissioning activities.

A limited review of the fire protection program found that the portions reviewed met requirements.

5 **Occupational Radiation Exposure (83750)**

5.1 Inspection Scope

The inspectors reviewed an audit report, surveillances and auditor's qualifications for audits and surveillances related to the occupational radiation exposures.

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

5.2 Observations and Findings

a. Audits and Surveillances

The Nuclear Quality Assurance Department Audit of 10 CFR 50 Activities, AP-772, included the area of occupational radiation exposures. The audit report was internally promulgated by the licensee memorandum JDW-028-03. This audit was conducted from February 17 to April 17, 2003. The audit concluded that the Part 50 activities audited were satisfactorily implemented and in compliance with the quality assurance program, the technical specifications, the nuclear security program and the emergency preparedness program. There were no findings and only one observation related to occupational radiation exposures.

The inspectors also reviewed surveillances Reports 03-032-SURV and 03-041-SURV. Both of these surveillances included, at least in part, occupational radiation exposure activities. Neither surveillance identified findings, observation issues, nor made recommendations for improvements.

The audit and surveillances reviewed were performance based and their overall quality was very good. Records indicated that all auditors that conducted the audits and surveillances reviewed were trained and qualified as audit team leaders.

b. Changes

The facility was at an advanced state of dismantling and decommissioning. At the completion of the spent fuel pool liner project no individual onsite was expected to exceed 100 millirem per year, and there would be no sources of airborne radioactivity that could subject workers to greater than 10 percent of the annual limit of intake. At that point the licensee intended to make substantial changes to their radiation protection program. These changes to the program were projected to occur on March 8, 2004.

The changes included elimination of most of the ALARA program; elimination of secondary dosimetry; discontinued use of respirators for radiological protection; discontinued pre-employment and annual whole body counts; discontinued high radiation areas, very high radiation areas and hot particle control programs. The changes also included the revision of the posting program to eliminate airborne radioactivity areas, red zones (hot particles), high radiation areas and very high radiation areas. Administrative changes included the elimination of formal training programs for the radiation protection staff, the maintenance and calibration of instrumentation no longer necessary such as instruments to measure higher radiation levels and secondary dosimetry.

The inspectors concluded that these changes were reasonable and appropriate.

c. External and Internal Exposure Control and Other Radiation Protection Inspection Areas

The inspectors interviewed the radiation protection manager and the cognizant radiation protection engineer regarding the occupational radiation exposure control program. The inspectors also examined occupational dosimetry records. During calendar year 2003 and as of March 4, 2004, no planned special exposures had been conducted.

The inspectors reviewed the occupational exposure records for calendar year 2003. The licensee's means of measuring external and internal exposure remained as described previously in Inspection Report 50-344/2003-01. The inspector selected five individual dosimetry records for review. An NRC Form 4 was prepared for each individual and the NRC Form 5 recorded doses were as reported by the dosimetry vendor in their reports.

During 2003, the highest assigned total effective dose equivalent (TEDE) was 0.949 rem. The highest exposed individual in 2003 received a significantly higher dose than in 2002 (0.169 rem). This higher exposure was expected and was due to the loading, welding, drying and moving canisters with spent fuel to the ISFSI. All worker doses were well below the limit established in 10 CFR Part 20.

The licensee had only one declared pregnancy worker during calendar years 2003 and 2004 as of the time of the inspection. The licensee maintained a signed

statement of the individual declaring her pregnancy and acknowledging that she had received instruction relative to the Appendix in NRC Regulatory Guide 8.13, Revision 3. The NRC Form 5 for 2003 maintained by the licensee indicated that her TEDE for 2003 was 0.032 rems. No committed effective dose equivalent was assigned to this individual. Training records indicated that occupationally exposed individuals attending Category II general employee training (GET) received instruction relative to the appendix in NRC Regulatory Guide 8.13, Revision 3. In summary, the individual, her supervisors and co-workers had received the required training, and the dose to the embryo/fetus was well below the regulatory limit specified in 10 CFR 20.1208.

On February 3, 2004, the licensee submitted its annual report of individual monitoring for calendar year 2003. NRC Form 5 was attached for each individual that was monitored. The inspectors noted that the report was submitted on a timely basis as required by 10 CFR 20.2206(c). The inspectors reviewed the dosimetry files of selected individuals to determine if the required report had been submitted. The NRC Form 5s reviewed were complete and included all the information required. The inspectors concluded that the licensee was meeting the requirements of 10 CFR 20.2206(b).

Appendix C, Section 1.5.1.1 of PGE-8010, Trojan Nuclear Plant Nuclear Quality Assurance Program requires that an annual exposure report for the previous year be submitted to the Commission within the first quarter of each calendar year in accordance with the guidance contained in Section 1.b.(3) of Regulatory Guide 1.16, Reporting of Operating Information. The licensee submitted its annual exposure report for 2003 on February 13, 2004. This report indicates that 51 individuals received exposure of greater than 100 millirem in 2003. The sum of the total effective dose equivalent for all individuals who received greater than 100 millirem was 16.985 rem. The inspectors determined that the report was timely and met the applicable requirements.

5.3 Conclusions

The audit and surveillances reviewed were performance-based, the auditors were trained and qualified as audit team leaders and the overall quality of the audits and surveillances was very good.

The licensee intended to substantially reduce or eliminate many radiation protection programs, procedures and instrumentation that were no longer needed. Since the facility was in an advanced state of decommissioning, the inspectors concluded that these changes were reasonable and appropriate.

The licensee was maintaining an effective program to monitor occupational radiation exposures, including a declared pregnant worker. Occupational exposures for calendar year 2003 were below regulatory limits. Required reports had been submitted on a timely basis and included all the required information.

7 Exit Meeting

On March 4, 2004, at the conclusion of the site visit, the inspectors presented to the licensee management and staff the preliminary inspection results. Subsequent to the site visit on April 1, 2004, the principal inspector conducted a telephonic exit interview with the plant manager to discuss the unresolved item identified in Section 1.2a. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspectors.

ATTACHMENT 1

SUPPLEMENTAL INSPECTION INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

C. Allen, ISFSI Lead Specialist
B. Baker, QA Specialist
C. Casciato, Licensing Specialist
K. Cox, ISFSI Manager
B. Eder, ISFSI Lead Specialist
J. Fisher, Decommissioning Planning 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

INSPECTION PROCEDURES USED

IP 37801 Safety Reviews, Design Changes, and Modifications
IP 60855 Operation of an Independent Spent Fuel Storage Installation
IP 62801 Maintenance and Surveillances
IP 71801 Decommissioning Performance and Status Review
IP 83750 Occupational Radiation Exposure

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-00344/0401-01 URI Implementation of the 10 CFR 50.59 review process.
72-00017/0401-01 IFI The implementing procedure for the ISFSI radiological environmental monitoring program does not including an acceptance criteria for evaluating TLD results.

Discussed

None

Closed

None

LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
CAR	Corrective Action Request
DCP	Detailed Construction Package
DPRM	Defueled Plant Modification Request
IP	Inspection Procedure
IRAC	Independent Review and Audit Committee
ISFSI	Independent Spent Fuel Storage Installation
ISR	Independent Safety Reviewer
ISRC	ISFSI Safety Review Committee
MR	Maintenance Request
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
ONI	Off-Normal Instruction
PGE	Portland General Electric
RCA	Radiologically Controlled Area
TIP	Trojan ISFSI Procedure
TLD	Thermo Luminescent Dosimeter
TNP	Trojan Nuclear Plant
TPP	Trojan Plant Procedure

ATTACHMENT 2

PARTIAL LIST OF DOCUMENTS REVIEWED

Audits and Surveillances

- Nuclear Quality Assurance Department Audit of 10 CFR 50 Activities, AP-772, dated May 1, 2003.
- Nuclear Quality Assurance Department Audit of the Trojan ISFSI, AP-I-002, dated September 29, 2003.
- ISFSI/Spent Fuel Pool Weekly Surveillance, 03-032-SURV, dated July 21, 2003.
- ISFSI/Spent Fuel Pool Weekly Surveillance, 03-034-SURV, dated August 4, 2003.
- Nuclear Oversight Surveillance of Trojan Spent Fuel Pool Liner Removal Project Activities, 03-041-SURV, dated November 18, 2003.
- Audit Team Leader Certification for Chuck Allen dated May 28, 2002.
- Audit Team Leader Certification for Chuck Allen dated May 20, 2003.
- Audit Team Leader Certification for Bill Baker dated May 30, 2002.
- Audit Team Leader Certification for Bill Baker dated May 27, 2003.
- Audit Team Leader Certification for Jerold Reid dated May 30, 2002.
- Audit Team Leader Certification for Jerold Reid dated May 22, 2003.
- Audit Team Leader Certification for Shamsher (Sham) Beri dated May 29, 2002.
- Audit Team Leader Certification for Shamsher (Sham) Beri dated May 27, 2003.
- Audit Team Leader Certification for Joel D. Westvold dated September 16, 2002.
- Audit Team Leader Certification for Joel D. Westvold dated September 11, 2003.

Correspondence

- TNP Memorandum dated February 2, 2004, from Kim Lehman to Managers & Supervisors, subject 10 CFR 50.59 Evaluator and Part 50 ISR Qualification List.
- Portland General Electric letter VPN-038-2002, signed by Stephen M. Quennoz, regarding deletion of PGE-1012, Portland General Electric (PGE) Fire Protection Plan for Trojan Nuclear Plant, September 4, 2003.

Design Changes and Work Orders

- Defueled Plant Modification Request (DPMR) 2003-001, Detailed Construction Package (DCP) 04, Revision 2, Radwaste Discharge Line to D&DS, approved December 18, 2003.
- Maintenance Request (MR) 33747, Deactivate Power Block Fire Protection (Loop 3), awaiting final approval by work group supervisor.
- Work Order 33526, 2-year mechanical preventative maintenance.
- Work Order 33527, semi-annual inspection and oil sample.
- Work Order 33528, quarterly inspection.
- Work Order 33529, annual mechanical preventative maintenance.
- Work Order 33540, perform semi-annual mechanical preventative maintenance.

Drawings

Concrete Cask Assembly Air Inlet Frame Details, Drawing NQI81106-4A, Revision 00, dated May 7, 2003.

Procedures and Reports

- Trojan Nuclear Plant Independent Safety Reviewer Charter, TPP 10-9, Revision 10, effective January 6, 2004.
- 10 CRF 50.59 and Other Regulatory Evaluations, TPP 18-1, Revision 19, effective January 6, 2004.
- Fire Protection Program, TPP 13-7, Revision 15, effective September 4, 2003.
- Trojan Organization and Responsibility, TPP 11-110, Revision 6, effective January 6, 2004.
- Portland General Electric (PGE) Nuclear Quality Assurance Program for Trojan Nuclear Plant, PGE-8010, Revision 27, effective January 6, 2004.
- Trojan Nuclear Plant Defueled Safety Analysis Report and License Termination Plan (PGE-1078) "The TNP Decommissioning Plan", PGE-1061, Revision 18.
- Certified ISFSI Specialist Training, TIP 41, Revision 1, effective January 28, 2004.
- Trojan ISFSI Management Organization and Responsibility TIP 01, Revision 2, effective September 4, 2003.

- 10 CFR 72.48 and Other Regulatory Evaluations, TIP 05, Revision 1, effective February 18, 2004.
- ISFSI Safety Review Committee Charter, TIP 02, Revision 0, effective September 4, 2003.
- Monitoring of the Concrete Cask System, TIP 12, Revision 5, effective September 16, 2003.
- Concrete Cask Thermal Monitoring Program, TIP 17, Revision 3, effective February 11, 2004.
- Structural Inspection Program, TIP 09, Revision 2, effective December 18, 2002.
- Response to Natural Phenomena Events, ONI 72-03, Revision 0, effective September 4, 2003.
- G1-G-01-LP, General Employee Training, Category II Student Handout, Revision 9.
- Inspector selected GET Category II training records, for training conducted in 2003 and 2004.
- VPN-006-2003, PGE-1080-2002, "Annual Report of the Trojan Independent Spent Fuel Storage Installation for 2002," dated February 26, 2003.
- VPN-011-2004, Annual Report of Individual Occupational Radiation Exposure Monitoring, dated February 3, 2004.
- VPN-012-2004, PGE-1015-2003, "Annual Report of the Trojan Nuclear Plant for 2003," dated February 3, 2004.
- VPN-015-2004, PGE-1080-2003, "Annual Report of the Trojan Independent Spent Fuel Storage Installation for 2003," dated February 24, 2004.

Memorandums and Agendas

- Minutes of IRAC/ISRC Meeting No. 2003-10, dated January 15, 2003, IRAC/ISRC-001-2003.
- Minutes of IRAC/ISRC Meeting No. 2003-03, dated September 8, 2003, IRAC/ISRC-010-2003.
- Minutes of IRAC/ISRC Meeting No. 2003-02, dated July 14, 2003, IRAC/ISRC-008-2003.

ATTACHMENT 3

LOADED HOLTEC CANISTERS AT THE TROJAN ISFSI

LOADING ORDER	HOLTEC MPC No.	ISFSI LOCATION	CONCRETE CASK No.	DATE ON PAD	HEAT LOAD (Kw)	MAXIMUM BURNUP MWd/mMTU	MAXIMUM FUEL ENRICHMENT	PERSON-HOURS TO LOAD	PERSON-REM DOSE
1	28	E33	PCC-03	Jan. 17, 2003	6.247 (4.1)	39,110	3.56	2,452	0.236
2	26	E32	PCC-04	Jan. 26, 2003	6.872 (4.7)	38,877	3.56	2,035	0.238
3	35	E11	PCC-09	Feb. 05, 2003	17.432 (14.33)	41,889	3.46	1,630	1.145
4	11	E12	PCC-10	Feb. 12, 2003	15.896 (12.9)	41,278	3.20	Not Available	0.950
5	18	E13	PCC-05	Feb. 16, 2003	15.426 (12.5)	39,966	3.45	Not Available	0.905
6	22	E14	PCC-06	Feb. 22, 2003	14.692 (11.8)	39,040	3.30	Not Available	0.660
7	36	E15	PCC-07	March 05, 2003	13.898 (11.1)	40,032	3.20	1,309	0.778
8	37	E16	PCC-08	March 13, 2003	12.187 (9.5)	40,632	3.20	1,247	0.446
9	38	E21	PCC-11	March 19, 2003	15.118 (12.2)	40,917	3.30	1,138	0.523
10	24	E22	PCC-12	March 26, 2003	17.009 (14.0)	36,364	3.40	1,096	0.472
11	30	E23	PCC-13	April 02, 2003	16.108 (13.1)	38,860	3.40	1,135	0.452
12	31	E24	PCC-14	April 07, 2003	15.611 (12.6)	38,769	3.40	1,076	0.402
13	32	E25	PCC-15	April 14, 2003	13.920 (11.1)	39,345	3.39	1,080	0.341
14	34	E26	PCC-16	April 20, 2003	11.648 (9.1)	35,019	3.11	889	0.305

LOADING ORDER	HOLTEC MPC No.	ISFSI LOCATION	CONCRETE CASK No.	DATE ON PAD	HEAT LOAD (Kw)	MAXIMUM BURNUP MWd/mMTU	MAXIMUM FUEL ENRICHMENT	PERSON-HOURS TO LOAD	PERSON-REM DOSE
15	39	E31	PCC-02	April 26, 2003	14,365 (11.5)	38,718	3.30	1,191	0.630
16	09	E34	PCC-17	May 02, 2003	15,362 (12.5)	37,698	3.40	1,098	0.461
17	29	E35	PCC-18	May 09, 2003	13,878 (11.1)	38,269	3.46	1,162	0.881
18	15	E36	PCC-19	May 14, 2003	10,973 (8.5)	37,681	3.10	1,070	0.437
19	08	W11	PCC-20	May 18, 2003	13,336 (10.5)	40,730	3.20	944	0.461
20	12	W14	PCC-21	May 24, 2003	14,552 (11.7)	37,009	3.40	841	0.460
21	16	W15	PCC-22	May 28, 2003	13,969 (11.2)	38,116	3.42	851	0.443
22	17	W16	PCC-23	June 03, 2003	10,931 (8.4)	33,830	3.10	861	0.272
23	07	W21	PCC-24	June 10, 2003	12,889 (10.2)	38,932	3.11	1,296	0.442
24	27	W22	PCC-25	June 15, 2003	13,228 (10.5)	40,244	3.45	921	0.514
25	13	W24	PCC-26	June 20, 2003	11,870 (9.3)	37,850	3.42	881	0.240
26	19	W25	PCC-27	June 26, 2003	10,071 (7.6)	37,461	3.56	838	0.182
27	20	W26	PCC-28	July 01, 2003	10,855 (8.4)	38,215	3.20	876	0.348
28	21	W31	PCC-29	July 06, 2003	10,497 (8)	35,363	3.10	825	0.297

LOADING ORDER	HOLTEC MPC No.	ISFSI LOCATION	CONCRETE CASK No.	DATE ON PAD	HEAT LOAD (Kw)	MAXIMUM BURNUP MWd/mMTU	MAXIMUM FUEL ENRICHMENT	PERSON-HOURS TO LOAD	PERSON-REM DOSE
29	23	W32	PCC-30	July 11, 2003	10.483 (8)	37,729	3.09	822	0.249
30	25	W33	PCC-31	July 17, 2003	9.652 (7.3)	33,187	3.10	860	0.207
31	40	W34	PCC-32	July 22, 2003	8.911 (6.5)	30,150	2.61	841	0.195
32	41	W35	PCC-33	July 28, 2003	8.719 (6.4)	33,732	3.10	787	0.275
33	42	W36	PCC-01	July 31, 2003	8.467 (6.2)	29,595	2.61	842	0.250
34	33	W23	PCC-34	Sep 03, 2003	12.183 (9.5)	37,153	3.42	1,115	0.626

- Notes:
- Heat Load (kw) is the sum of the heat load values for all 24 spent fuel assemblies. Heat load was calculated based on January 1, 1998. The value in parenthesis is the corrected value for December 1, 2002.
 - Burnup is the value for the spent fuel assembly with the highest individual discharge burnup.
 - Fuel Enrichment is the spent fuel assembly with the highest individual enrichment per cent of U-235
 - Person-hours to load does not include cannister preparation. Clock starts when cannister placed in Spent Fuel Pool.