**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD
ARLINGTON, TX 76011-4511

February 16, 2018

Mr. Bradley Y. Jenkins
Vice President, Generation
Portland General Electric Company
71760 Columbia River Highway
Rainier, OR 97048

SUBJECT: TROJAN INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) INSPECTION REPORT 07200017/2017001

Dear Mr. Jenkins:

This letter refers to a routine U.S Nuclear Regulatory Commission (NRC) inspection conducted from December 11-13, 2017, of the dry cask storage activities associated with your Independent Spent Fuel Storage Installation (ISFSI). A preliminary exit was held with your staff on December 13, 2017. After discussion with NRC management and continued review of information provided and gathered during the inspection, a final exit was conducted on January 17, 2018, with Mr. Mark Tursa, ISFSI Manager, and other members of your staff. The enclosed inspection report documents the details of the inspection.

The NRC inspection examined 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 reviewed compliance with the requirements specified in your site specific Materials License No. SNM-2509, the associated Technical Specifications, the Trojan ISFSI Final Safety Analysis Report (FSAR), and the regulations in Title 10 of the Code of Federal Regulations (CFR) Part 72 and Part 20.

The inspection reviewed the areas of radiation safety, quality assurance, corrective action program, safety evaluations, cask maintenance, and how you addressed industry issues that affected your ISFSI program. The inspection also reviewed the changes made to your ISFSI program since the last NRC routine ISFSI inspection. The ISFSI operations were found to be in compliance with the applicable NRC regulations and requirements. No violations of NRC regulations were identified.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure" a copy of this letter, its enclosure, and your response, if you choose to provide one, 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 or proprietary information so that it can be made available to the public without redaction.

Should you have any questions concerning this inspection, please contact the undersigned at (817) 200-1191 or Mr. Lee Brookhart at (817) 200-1549.

Sincerely,

/RA/

Ray L. Kellar, P.E., Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Docket: 72-17
License: SNM-2509

Enclosure:
Inspection Report 072-00017/2017001

w/attachments:
1. Supplemental Information
2. Loaded Casks at the Trojan ISFSI

cc:

Chairman, Board of County Commissioners
Columbia County
230 Strand Street
St. Helens, OR 97501

Maria Pope
President and Chief Executive Officer
Portland General Electric Company
121 SW Salmon Street
Portland OR 97204

Todd Cornett
Sitting Division Administrator
Oregon Department of Energy
625 Marion Street NE
Salem, OR 97301-3742

Lloyd K. Marbet
Executive Director
Oregon Conservancy Foundation
19140 SE Bakers Ferry Rd.
Boring, OR 97009

Lisa Kaner, Esq.
Vice-President, General Counsel
and Corporate Compliance Officer
121 SW Salmon Street
Portland OR 97204

Mark Tursa, ISFSI Manager
Portland General Electric Company
Trojan ISFSI
71760 Columbia River Highway
Rainier, OR 97048

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

| | |
|---|---|
| Dockets: | 07200017 |
| Licenses: | SNM-2509 |
| Report Nos.: | 07200017/2017001 |
| Licensee: | Portland General Electric Company |
| Facility: | Trojan Independent Spent Fuel Storage Installation (ISFSI) |
| Location: | 71760 Columbia River Highway<br>Rainier, OR 97048 |
| Dates: | December 11-13, 2017 |
| Inspector: | Lee E. Brookhart, Senior Inspector<br>Fuel Cycle and Decommissioning Branch |
| Approved By: | Ray L. Kellar, P.E., Chief<br>Fuel Cycle and Decommissioning Branch<br>Division of Nuclear Materials Safety |

## EXECUTIVE SUMMARY

Trojan Independent Spent Fuel Storage Installation
NRC Inspection Report 07200017/2017001

The U.S. Nuclear Regulatory Commission (NRC) conducted a routine inspection of the licensee's programs and activities for safe handling and storage of spent fuel at the Trojan Independent Spent Fuel Storage Installation (ISFSI) on December 11-13, 2017. The inspection reviewed a number of topics to evaluate compliance with the applicable NRC regulations and the provisions of the site-specific license SMN-2509. Trojan's unique design utilized a Holtec Multi-Purpose Canister (MPC) and a BNFL Fuel Solutions TranStor concrete over-pack. Thirty-four casks had been loaded and stored on the Trojan ISFSI pad. All spent nuclear fuel was moved to the ISFSI between January 2003 and September 2003. The Part 50 license for the Trojan reactor facility was terminated in 2005. Since then, a majority of the site structures not related to the ISFSI have been dismantled and completely removed from the site. The ISFSI facility was well maintained and dose rates around the perimeter were being monitored. Perimeter dose rates measured since the fuel was loaded into the ISFSI have continued to drop as the spent fuel decays. A review of the environmental monitoring program demonstrated that radiological exposures to offsite locations and individuals were in compliance with federal regulations. The quality assurance (QA) program and corrective action program were being effectively implemented to capture and correct issues related to the dry cask storage program.

The NRC routine inspection reviewed documentation relevant to ISFSI activities and operations that have occurred at Trojan since the last ISFSI inspection that was performed in December of 2015. In summary, the licensee was conducting ISFSI activities in compliance with regulatory and license requirements.

Away-From-Reactor ISFSI Inspection Guidance (60858)

- The licensee was conducting quality assurance (QA) audits of the ISFSI program. A review of the audit reports determined that the audits were covering a broad range of topics. A number of recommendations were identified in the audits and entered into the ISFSI Activities Database for implementation. (Section 1.2.a)

- Radiation data reviewed from the 2015 and 2016 environmental monitoring reports determined that offsite radiation levels were in compliance with 10 CFR 72.104. (Section 1.2.b)

- Required records were maintained that described the specific fuel parameters for the spent fuel stored in each of the licensee's loaded storage casks. (Section 1.2.c)

- Since the last NRC ISFSI inspection, Trojan had made a single revision to its FSAR in Revision 14. No issues were identified in the review of the changes associated with the revision. (Section 1.2.d)

- Selected condition reports were reviewed for the period December 2015 through December 2017. Licensee resolution of the condition reports were appropriate for the safety significance of the issue. No adverse trends were identified during the review. (Section 1.2.e)

- Concrete cask temperature monitoring requirements specified in Technical Specification 5.5.3 were performed daily and vent surveillances were performed weekly as required. No temperature issues with the casks were found during the review of selected records. (Section 1.2.f)

- Annual concrete cask, ISFSI pad, and transfer station inspections had been completed in accordance with FSAR requirements. Only minor superficial concrete surface issues were identified and repaired. (Section 1.2.g)

- The inspector verified that the annual site drills and biennial exercises had been performed for the period of 2016 through 2017, in compliance with the site's emergency plan and 10 CFR 72.32 (a)(12) requirements. (Section 1.2.h)

- Internal safety reviews were being conducted as required. A review of the annual reports of the ISFSI Safety Review Committee indicated a strong oversight of ISFSI activities was being implemented by the licensee. (Section 1.2.i)

- The US Army Corps of Engineers installed an anchor buoy designated as the Prescott Anchorage Area on the Columbia River. An Unresolved Item (URI) was opened in the last routine ISFSI inspection to track the licensee's review of the use of the anchor to ensure it was bounded by the Trojan FSAR's fire hazards and explosions analyses. Since the last inspection the licensee had just received an analysis from a qualified vendor. At the time of the inspection the analysis had not been reviewed nor accepted by the licensee. The NRC plans to review the analysis once the licensee reviews, accepts, and implements the analysis into the license documents during the next routine inspection of Trojan's ISFSI. (Section 1.2.j)

Review of 10 CFR 72.48 Evaluations (60857)

- All required safety screenings had been performed in accordance with the licensee's procedures and 10 CFR 72.48 requirements. All screenings reviewed were determined to be adequately evaluated. (Section 2)

## Report Details

### Summary of Facility Status

The Trojan Independent Spent Fuel Storage Installation (ISFSI) had been loaded with 34 storage casks between January 2003 and September 2003 containing all the spent nuclear fuel generated from the Trojan Nuclear Power Plant. Each BNFL Fuel Solutions TranStor concrete cask contained one Holtec Multi-Purpose Canister (MPC) of the MPC-24E or MPC-24EF design. The MPC-24E and MPC-24EF are designed to accommodate up to 24 pressurized water reactor fuel assemblies. Trojan's ISFSI has a secured protected area which is located adjacent to the area where the Trojan reactor had been originally located. The reactor facility was radiologically remediated to release limits and demolished. The reactor site was released by the NRC from radiological controls under the Part 50 license on May 23, 2005. The ISFSI is maintained under a site-specific NRC Part 72 license. The facility was staffed primarily by personnel who had worked at the Trojan site when it was an operating reactor facility. This staff has continued to maintain the spent fuel in a safe configuration along with the necessary programs and records that confirm compliance with NRC regulations and the site license.

The casks at the Trojan ISFSI were loaded using SNM-2509 License Amendment 3 and Final Safety Analysis Report (FSAR) Revision 2 or 3, but were all currently being maintained under SNM-2509 License Amendment 6 and the FSAR Revision 14 at the time of the inspection.

## 1 Away-From-Reactor ISFSI Inspection Guidance (60858)

### 1.1 Inspection Scope

An inspection of the status of the loaded casks at Trojan was completed to verify compliance with requirements of its SNM-2509 License, ISFSI FSAR, and federal regulations. The inspection reviewed a broad range of topics including audits conducted under the licensee, condition reports related to the ISFSI, environmental radiological data collected around the ISFSI for the past several years, review of the cask maintenance records, and review of industry issues that affected the site's ISFSI program. A tour of the ISFSI area was performed by the inspector, around the perimeter of the ISFSI pad and near the casks.

### 1.2 Observations and Findings

#### a. Quality Assurance (QA) Audits and Surveillances

The Portland General Electric Company had issued several audit reports for the Trojan ISFSI since the last inspection conducted in December 2015. The audits covered ISFSI documentation and activities related to ISFSI Technical Specifications; FSAR requirements; implementation of ISFSI programs; training and qualifications; design control; procurement control; inspections; Important to Safety operations; and other ISFSI related areas. The inspector reviewed the 2016 and 2017 Audits of Trojan ISFSI Operations, which were documented in Audit Report 2016-I-028 and Audit Report 2014-I-031. In addition, the independent assessment of the 2017 Biennial ISFSI Emergency Exercise was reviewed.

No findings were identified by the Trojan audit teams. All recommendations identified by the QA audits were reviewed and appropriately placed in either the ISFSI Activities

Database or the licensee's Corrective Action Program (CAP). The licensee's QA audits were found to be quiet extensive and the licensee maintained a low threshold for making audit recommendations. No NRC findings were identified regarding the licensee's QA Program audits.

b. Radiological Conditions Related to Stored Casks

A tour of the ISFSI pad was performed during the inspection. The tour found the 34 loaded casks to be in good physical condition. No flammable or combustible materials were observed inside the ISFSI protected area fence. A recent radiological survey of the ISFSI pad was provided to the NRC inspector upon arrival on-site.

Offsite and onsite radiological monitoring data from the 2015 and 2016, *ISFSI Environmental Monitoring Results* were reviewed. The reports were generated by the Trojan Radiological Environmental Monitoring Program (REMP). The program utilized a total of 16 environmental monitoring locations onsite. Trojan had switched from thermoluminescent (TLD) dosimeters to the Optically Stimulated Luminescence (OSL) dosimeters in the beginning of the 2nd quarter of 2016. Eight locations were in close proximity to the ISFSI and were located along the Control Access Area fence (OSL locations 8 – 15). The other 8 locations were further away from the ISFSI, but were within the Controlled Area Boundary (OSL locations 1 – 7 and 16). The ISFSI Controlled Access Area fence is roughly 50 to 105 feet around the outside of the ISFSI pad. The Controlled Access Boundary is a 200 meter (roughly 656 feet) perimeter around the Trojan ISFSI. The REMP also utilized two OSL monitoring locations to provide the control or background dose (OSL locations 17 and 18).

The ISFSI Controlled Access Boundary monitoring locations are the ones used to demonstrate compliance with the 10 CFR 72.104 requirements for radiation dose. Locations 1-6 represent OSL locations at or near the licensee's designated controlled area boundary. The highest reading from OLSs 1-6 were used to calculate the maximum dose rate from the ISFSI pad. Monitoring locations 7 and 16 were much closer to the ISFSI pad on the shoreline side of the site at distances of 100 and 30 meters, respectively. The higher of those two measurements was used to calculate the annual recreational shoreline dose attributable to the ISFSI.

The licensee calculated that the maximum dose that could have been received as a result of the ISFSI operations for the year 2015 was an occupational dose of 5.9 milliRoentgen (mrem) based on TLD monitoring location 6 and a recreational dose of 1.5 mrem based on TLD monitoring location 16. The following year, 2016, the calculated doses were based on the more accurate OSL monitoring data, which resulted in a calculated occupational dose of 0.2 mrem for OSL monitoring location 6 and a recreational dose of 0.6 mrem for OSL monitoring location 16. The occupational dose was calculated using an occupancy factor based on 2,080 hours worked on site per year. The shoreline dose was calculated using a recreational factor based on 24 hours of time spent at the shoreline or boating near the site per year. Both of the calculated values were below the 10 CFR 72.104 dose requirement which limited the dose to less than 25 mrem per year.

c. Cask Records of Fuel Contents

Permanent records describing the spent fuel stored in Trojan's ISFSI are required by 10 CFR 72.212(b)(12). A review of the Trojan ISFSI records was performed to determine if an adequate description of the spent fuel loaded in the casks was documented as a permanent and retrievable record. The fuel assembly contents of each of the loaded canisters used at Trojan were documented in an online database and in binders titled, "Spent Nuclear Fuel Verification Plan." Records for fuel burn up in megawatt days per metric ton uranium (MWD/MTU), original U-235 enrichment percentage, and discharge date were found in Section 3 of the binder, "Trojan Nuclear Plant Fuel SNM Inventory." The heat load calculation data was stored in another file titled "Trojan ISFSI MPC Heat Load Calculation." Spreadsheets attached to that document were reviewed and was verified to contain each fuel assemblies' decay heat in watts. No issues, regarding record retention, were identified by the NRC inspector.

d. Changes to the SNM-2509 License and FSAR

At the time of the last inspection conducted in December 2015, Trojan was utilizing SNM-2509 License Amendment 6 and FSAR Revision 13. Since then Trojan had made a single revision to the FSAR in Revision 14, dated February 1, 2017.

The major changes associated with Revision 14 of the FSAR included updating a number of sections in the FSAR due to a revised postulated transfer cask drop evaluation involving a partially loaded MPC. This revised analysis was performed to address a vendor bulletin, which identified the partially loaded canister required additional analysis to ensure it was adequately bounded by a fully loaded canister drop analysis. The new drop analysis demonstrated that the resulting drop g-loads of a partially loaded canister did not exceed (or approach) any limit specified in the design basis documents for a fully loaded canister. Additional changes in Revision 14 consisted of general editorial updates and adding additional information associated with Trojan's ISFSI decommissioning plan. No issues were identified relating to review of the FSAR changes.

e. Corrective Action Program

A list of condition reports issued since the last NRC inspection was provided to the inspector by the licensee for the ISFSI activities. The inspector found that the issues were processed in accordance with Trojan ISFSI Procedure (TIP) 50 "Corrective Action Program," Revision 3. When an adverse to quality issue was identified, the licensee would document the issue as a Corrective Action Request (CAR) and assign a CAR tracking number. When issues were identified that did not meet the definition of adverse to quality, the licensee would capture the issue and resolution of the condition through the site's Maintenance Request (MR) system. All issues identified were given a MR number and resolutions were tracked in the MR system's database.

From the short list of condition reports and longer list of maintenance requests relating to the ISFSI and site operations, a total of five CARs and approximately 20 MRs were selected by the inspector for additional review. The CARs and MRs were related to a variety of issues. The CARs reviewed were well documented and were properly categorized based on the safety significance of the issue. The corrective actions taken were appropriate for the situations. Based on the level of detail of the CARs and MRs,

the licensee demonstrated a high attention to detail in regard to the maintenance and operation of its ISFSI program. No NRC safety concerns were identified related to the CARs or MRs reviewed.

f. Weekly Vent Inspections and Daily Temperature Inspections per TS 5.5.3

Trojan's License SNM-2509 Technical Specification 5.5.3 required that the air outlet temperature and the ambient air temperature for each cask be measured daily. In addition to the temperature checks, all air inlet vents for each concrete cask was required to be inspected weekly to verify each vent was free of blockage. To perform these actions the licensee utilized Procedure TIP 17 "Concrete Cask Thermal Monitoring System," Revision 7 for recording the concrete cask temperatures obtained from a digital readout. The change in temperature between the outlet vents and the ambient temperature was recorded and reviewed to ensure the difference was below 180 degrees F. Licensee Procedure TIP 12 "Monitoring of the Concrete Cask System," Revision 9, incorporated the technical specification requirement for weekly visual inspection of all concrete cask air vents for blockage. Documentation of both required surveillances were reviewed for the months of December 2015, September 2016, and June 2017. The licensee records indicated that the technical specifications had been performed and correctly documented. No abnormal observations were noted during the reviewed time frames.

g. Concrete Casks, ISFSI pad, and Transfer Station Annual Visual Inspection

Trojan FSAR Section 9.7.6 required periodic inspection of the concrete casks, ISFSI pad, and transfer station to ensure structural integrity. An annual inspection program was implemented by the licensee using Procedure TIP 09, "Structural Inspection Program," Revision 7. Procedure TIP 09 discussed the annual visual inspection of the casks, the storage pad surface, the ISFSI pad surface, the transfer pad surface, and the transfer station. All steel, concrete surfaces, including cask vertical surfaces, and the inlet/outlet screens were visually inspected for defects and irregularities. The definition section of the procedure provided clear definitions for defects and irregularities. For the concrete casks, a defect of the concrete surface was described as scabbing, spalling or cracking larger than approximately 1/2 inch in diameter or width with a depth greater than 1/4 inch. For the pad, a defect was defined as visible signs of settling, movement, or holes/large cracks greater than 1/2 inch across and extending to the rebar.

The licensee had kept very detailed documentation on the annual visual inspections performed on the casks, ISFSI pad, and transfer station. Each cask, the ISFSI pad, and the transfer station had its own defect log book. The log books contained each year's inspection results that documented all defects and irregularities that were found. The defect log books also contained detailed pictures of the defects/irregularities that were found. The defects/irregularities that were recorded in the log books had a before repair and after repair photograph. A select number of defect log books were reviewed for the period 2016 and 2017. The NRC inspector reviewed the annual maintenance records for approximately 12 of the 34 casks, the ISFSI pad, and the transfer station. The inspector verified that no significant issues were identified by the licensee during those inspections. All small defects/irregularities such as small holes and pitting were noted for repair. The discrepancies identified by the licensee were repaired with an approved silicone sealant. The inspector found that the licensee's implementation of their annual maintenance program was performed with significant attention to the details associated

with the repair and documentation of all defects which ensured the casks, ISFSI pad, and transfer station remained in excellent condition. No issues were identified related to the licensee's annual maintenance program.

h. Emergency Plan

The licensee had not made a change to the site's Emergency Plan since the last routine ISFSI inspection in December 2015. The Trojan Emergency Plan had remained at Revision 10.

Section 7.1.2 of the emergency plan required a fire, a medical, and a radiological/health physics drill to be performed on an annual basis. In addition to the three drills, a site exercise was required biennially. The licensee had successfully conducted all the required drills and exercises since the last ISFSI inspection. The biennial exercise package for 2017 and the multiple drills packages were selected for additional review. The selected drills met the objectives of site Emergency Plan Step 7.1. The drill and exercise packages included a description of the drill that was conducted, a timeline, a synopsis, and a drill/exercise critique. All recommendations identified in the critiques were placed into the licensee's ISFSI Activities Database for tracking purposes. Offsite support agencies, including the Columbia River Fire and Rescue, the Oregon Department of Energy, the United States Coast Guard, and the Columbia County Emergency Management, were notified of the exercises and offered the opportunity to participate consistent with 10 CFR 72.32 (a)(12)(ii).

i. Safety Review Committee

Activities of the ISFSI Safety Review Committee (ISRC) were reviewed, including the annual reports for 2016 and 2017. The ISRC Charter is established in Procedure TIP 02, *"ISFSI Safety Review Committee Charter,"* Revision 2. The charter defined the purpose and responsibilities of the ISRC, membership requirements, training and qualification requirements for members, topical areas to be reviewed by the ISRC, and meeting/quorum requirements. The assigned members to the ISRC were documented in writing and approved by the ISRC Chairman and the Corporate Executive Responsible for Trojan on TIP 02, Attachment 1, *"ISRC Membership Training and Qualification Requirements."* The ISRC meetings discussed numerous topics, including staffing level and upcoming retirements, license renewal, site improvement projects, NRC inspections, ISFSI security, emergency planning, readiness for severe natural phenomena events, financial assurance, recently conducted QA audits, and implementation of the site QA program. Good discussions were documented in the annual meeting reports indicating the ISRC members were taking a broad look at site activities.

j. Columbia River Prescott Anchorage Area

In the last routine ISFSI inspection (ADAMS Accession No. ML15351A487), a URI was documented relating to the licensee's review to ensure that the use of the Prescott Anchorage Area still meets the analyses of the Trojan's FSAR for explosions and fire hazards (URI 72-17/1501-01).

In August 2012, the US Army Corps of Engineers installed an anchor buoy for the newly designated Prescott Anchorage Area on the Columbia River. The anchor buoy is

located along the Columbia River between mile markers 72.1 and 72.5. The anchorage is 0.4 miles long and was intended to accommodate one vessel. During the past routine inspection, the NRC inspector was unable to determine if the supporting analyses for Trojan FSAR Sections 2.2.3.1 “Explosions” and Section 8.2.8 “Explosions of Chemicals, Flammable Gasses, and Munitions” remained bounding due to the large ships utilizing the installed buoy.

Since the last inspection, the licensee initiated CAR 16-001 to address the NRC’s URI. The corrective actions from the CAR included contracting a qualified vendor to perform a quality-related analysis of the probability and consequences of the river and railcar explosion scenarios on the ISFSI as described in Sections 8.2.8 and 2.2.3.1 of the FSAR. The licensee included a review of railcar scenarios since rail traffic had possibly changed since the original analysis was performed. The results of this analysis was to be incorporated into Trojan licensing documents as appropriate.

At the time of the NRC inspection, Trojan had just received the vendor’s analysis. The analysis had not been formally reviewed nor accepted by the licensee at the time of the inspection. The NRC plans to review the analysis once the licensee reviews, accepts, and implements the analysis into the license documents during the next routine inspection of Trojan’s ISFSI.

1.3 Conclusions

The licensee was conducting QA audits of the ISFSI program. A review of the audit reports determined that the audits were covering a broad range of topics. A number of recommendations were identified in the audits and entered into the ISFSI Activities Database for implementation.

Radiation data reviewed from the 2015 and 2016 environmental monitoring reports determined that offsite radiation dose levels were in compliance with 10 CFR 72.104.

Required records were maintained that described the specific fuel parameters for the spent fuel stored in each of the licensee’s loaded storage casks.

Since the last NRC ISFSI inspection, Trojan had made a single revision to its FSAR in Revision 14. No issues were identified in the review of the changes associated with the revision.

Selected condition reports were reviewed for the period December 2015 through December 2017. Licensee resolutions of the condition reports were appropriate for the safety significance of the issue. No adverse trends were identified during the review.

Concrete cask temperature monitoring requirements specified in Technical Specification 5.5.3 were performed daily and vent surveillances were performed weekly as required. No temperature issues with the casks were found during the review of selected records.

Annual concrete cask, ISFSI pad, and transfer station inspections had been completed in accordance with FSAR requirements. Only minor superficial concrete surface issues were identified and repaired.

The inspector verified that the annual site drills and biennial exercises had been performed for the period of 2016 through 2017, in compliance with the site's emergency plan and 10 CFR 72.32 (a)(12) requirements.

Internal safety reviews were being conducted as required. A review of the annual reports of the ISFSI Safety Review Committee indicated a strong oversight of ISFSI activities was being implemented by the licensee.

The US Army Corps of Engineers installed an anchor buoy designated as the Prescott Anchorage Area on the Columbia River. A URI was opened in the last routine ISFSI inspection to track the licensee's review of the use of the anchor to ensure it was bounded by the Trojan FSAR's fire hazards and explosions analyses. Since the last inspection the licensee had just received an analysis from a qualified vendor. At the time of the inspection the analysis had not been reviewed nor accepted by the licensee. The NRC plans to review the analysis once the licensee reviews, accepts, and implements the analysis into the license documents during the next routine inspection of Trojan's ISFSI.

## 2 Review of 10 CFR 72.48 Evaluations (60857)

### 2.1 Inspection Scope

The licensee's 10 CFR 72.48 screenings and evaluations since the December 2015 routine ISFSI inspection were reviewed to determine compliance with regulatory requirements.

### 2.2 Observations and Findings

A list of modifications to the ISFSI program including procedure revisions was provided by the licensee. Seven 10 CFR 72.48 screenings were selected for further review. No full 72.48 safety evaluations were completed since the last NRC inspection. The licensee utilized Procedure TIP 05 "10 CFR 72.48 and Other Regulatory Evaluations," Revision 7 to perform the 10 CFR 72.48 safety screenings and evaluations. The Five 72.48 screenings were reviews performed to change some ISFSI operations procedures. Two 72.48 screens were completed to update the site's FSAR. No other modifications to the ISFSI equipment, components, or the facility had been performed since the last inspection. No issues were identified in the review of the 72.48 screens.

### 2.3 Conclusions

All required safety screenings had been performed in accordance with the licensee's procedures and 10 CFR 72.48 requirements. All screenings reviewed were determined to be adequately evaluated.

## 3 Exit Meeting

The inspector reviewed the scope and findings of the inspection during a telephonic exit conducted with Mr. Mark Tursa, ISFSI Manager, and other members of the Trojan ISFSI staff on January 17, 2017.

## SUPPLEMENTAL INSPECTION INFORMATION

## PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

B. Eder, ISFSI Specialist
M. Kramberg, ISFSI Specialist
K. Lehman, Admin Assistant
J. Vanlooven, Radiation Protection and ISFSI Specialist
M. Tursa, ISFSI Manager

## INSPECTION PROCEDURES USED

| | |
|---|---|
| IP 60858 | Away-From-Reactor ISFSI Inspection Guidance |
| IP 60857 | Review of 10 CFR 72.48 Evaluations |

## LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Discussed

| | | |
|---|---|---|
| 72-17/1501-01 | URI | Use of Prescott Anchorage Bounded by Trojan's FSAR |

Closed

None

## LIST OF ACRONYMS

| | |
|---|---|
| ADAMS | Agencywide Documents Access and Management System |
| CAP | Corrective Action Program |
| CAR | Corrective Action Request |
| CFR | Code of Federal Regulations |
| FSAR | Final Safety Analysis Report |
| ISFSI | Independent Spent Fuel Storage Installation |
| kW | kilo-watt |
| MPC | multipurpose canister |
| MWD/MTU | megawatt days/metric ton uranium |
| NRC | U.S. Nuclear Regulatory Commission |
| OSL | Optically Stimulated Luminescence dosimeter |
| QA | Quality Assurance |
| REMP | Radiological Environmental Monitoring Program |
| TLD | thermoluminescent dosimeter |
| TIP | Trojan ISFSI Procedure |
| U-235 | Uranium 235 |
| URI | Unresolved Item |

## LOADED CASKS AT THE TROJAN ISFSI

| LOADING ORDER | HOLTEC MPC No. | ISFSI LOCATION | CONCRETE CASK No. | DATE ON PAD | HEAT LOAD (kW) | BURNUP MWd/MTU (max) | MAXIMUM FUEL ENRICHMENT % | PERSON-REM DOSE |
|---|---|---|---|---|---|---|---|---|
| 1 | 28 | E33 | PCC-03 | January 17, 2003 | 6.247 | 39,110 | 3.56 | 0.236 |
| 2 | 26 | E32 | PCC-04 | January 26, 2003 | 6.872 | 38,877 | 3.56 | 0.238 |
| 3 | 35 | E11 | PCC-09 | February 5, 2003 | 17.432 | 41,889 | 3.46 | 1.145 |
| 4 | 11 | E12 | PCC-10 | February 12, 2003 | 15.896 | 41,278 | 3.20 | 0.950 |
| 5 | 18 | E13 | PCC-05 | February 16, 2003 | 15.426 | 39,966 | 3.45 | 0.905 |
| 6 | 22 | E14 | PCC-06 | February 22, 2003 | 14.692 | 39,040 | 3.30 | 0.660 |
| 7 | 36 | E15 | PCC-07 | March 5, 2003 | 13.898 | 40,032 | 3.20 | 0.778 |
| 8 | 37 | E16 | PCC-08 | March 13, 2003 | 12.187 | 40,632 | 3.20 | 0.446 |
| 9 | 38 | E21 | PCC-11 | March 19, 2003 | 15.118 | 40,917 | 3.30 | 0.523 |
| 10 | 24 | E22 | PCC-12 | March 26, 2003 | 17.009 | 36,364 | 3.40 | 0.472 |
| 11 | 30 | E23 | PCC-13 | April2, 2003 | 16.108 | 38,860 | 3.40 | 0.452 |
| 12 | 31 | E24 | PCC-14 | April 7, 2003 | 15.611 | 38,769 | 3.40 | 0.402 |
| 13 | 32 | E25 | PCC-15 | April 14, 2003 | 13.920 | 39,345 | 3.39 | 0.341 |
| 14 | 34 | E26 | PCC-16 | April 20, 2003 | 11.648 | 35,019 | 3.11 | 0.305 |
| 15 | 39 | E31 | PCC-02 | April 26, 2003 | 14.365 | 38,718 | 3.30 | 0.630 |

| LOADING ORDER | HOLTEC MPC No. | ISFSI LOCATION | CONCRETE CASK No. | DATE ON PAD | HEAT LOAD (kW) | BURNUP MWd/MTU (max) | MAXIMUM FUEL ENRICHMENT % | PERSON-REM DOSE |
|---|---|---|---|---|---|---|---|---|
| 16 | 09 | E34 | PCC-17 | May 2, 2003 | 15.362 | 37,698 | 3.40 | 0.461 |
| 17 | 29 | E35 | PCC-18 | May 9, 2003 | 13.878 | 38,269 | 3.46 | 0.881 |
| 18 | 15 | E36 | PCC-19 | May 14, 2003 | 10.973 | 37,681 | 3.10 | 0.437 |
| 19 | 08 | W11 | PCC-20 | May 18, 2003 | 13.336 | 40,730 | 3.20 | 0.461 |
| 20 | 12 | W14 | PCC-21 | May 24, 2003 | 14.55 | 37,009 | 3.40 | 0.460 |
| 21 | 16 | W15 | PCC-22 | May 28, 2003 | 13.969 | 38,116 | 3.42 | 0.443 |
| 22 | 17 | W16 | PCC-23 | June 3, 2003 | 10.931 | 33,830 | 3.10 | 0.272 |
| 23 | 07 | W21 | PCC-24 | June 10, 2003 | 12.889 | 38,932 | 3.11 | 0.442 |
| 24 | 27 | W22 | PCC-25 | June 15, 2009 | 13.228 | 40,244 | 3.45 | 0.514 |
| 25 | 13 | W24 | PCC-26 | June 20, 2003 | 11.870 | 37,850 | 3.42 | 0.240 |
| 26 | 19 | W25 | PCC-27 | June 26, 2003 | 10.071 | 37,461 | 3.56 | 0.182 |
| 27 | 20 | W26 | PCC-28 | July 1, 2003 | 10.855 | 38,215 | 3.20 | 0.348 |
| 28 | 21 | W31 | PCC-29 | July 6, 2003 | 10.497 | 35,363 | 3.10 | 0.297 |
| 29 | 23 | W32 | PCC-30 | July 11, 2003 | 10.483 | 37,729 | 3.09 | 0.249 |
| 30 | 25 | W33 | PCC-31 | July 17, 2003 | 9.652 | 33,187 | 3.10 | 0.207 |
| 31 | 40 | W34 | PCC-32 | July 22, 2003 | 8.911 | 30,150 | 2.61 | 0.195 |
| 32 | 41 | W35 | PCC-33 | July 28, 2003 | 8.719 | 33,732 | 3.10 | 0.275 |

| LOADING ORDER | HOLTEC MPC No. | ISFSI LOCATION | CONCRETE CASK No. | DATE ON PAD | HEAT LOAD (kW) | BURNUP MWd/MTU (max) | MAXIMUM FUEL ENRICHMENT % | PERSON-REM DOSE |
|---|---|---|---|---|---|---|---|---|
| 33 | 42 | W36 | PCC-01 | July 31, 2003 | 8.467 | 29,595 | 2.61 | 0.250 |
| 34 | 33 | W23 | PCC-34 | September 3, 2003 | 12.183 | 37,153 | 3.42 | 0.626 |

**NOTES:**
- Heat load (kW) is the sum of the heat load values for all spent fuel assemblies in the cask
- Burn-up is the value for the spent fuel assembly with the highest individual discharge burn-up
- Fuel enrichment is the spent fuel assembly with the highest individual “initial” enrichment per cent of U-235

All casks are currently maintained under SNM-2509, License Amendment 6 and the Final Safety Analysis Report, Revision 14.

IR 07200017/2017-001; TROJAN ISFSI – DATED FEBRUARY 16, 2018

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ADAMS ACCESSION NUMBER: ML18045A073

| ■ SUNSI Review By: LEB | ADAMS: ■ Yes ☐ No | ☐ Sensitive ■ Non-Sensitive | ☐ Non-Publicly Available ■ Publicly Available | Keyword NRC-002 |
|---|---|---|---|---|

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