PGE
Portland General Electric Company
Trojan ISFSI
71760 Columbia River Hwy
Rainier, Oregon 97048

November 12, 2007
VPN-010-2007

Trojan ISFSI
Docket 72-17
License SNM-2509

ATTN: Document Control Desk
Director, Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Transmittal of Revision 8 to PGE-1069,
Trojan Independent Spent Fuel Storage Installation (ISFSI) Safety Analysis Report (SAR)

Pursuant to 10 CFR 72.70, this letter transmits Revision 8 to Portland General Electric Company's SAR for the Trojan ISFSI. Revision 8 includes changes to the SAR since the last submittal. The Attachment to this letter includes a brief description of the changes included with this revision. Text changes are identified in the SAR by margin bars adjacent to the changes and revision numbers in the page footers.

I hereby certify that Revision 8 accurately presents changes made since Revision 7 necessary to reflect information and analyses submitted to the Commission or prepared pursuant to Commission requirements.

Controlled copy holders are to update their controlled copies per the instructions provided with the enclosure.

Any questions concerning this revision may be directed to Mr. Jay Fischer, of my staff, at (503) 556-7030.

Sincerely,

Stephen M. Quennoz
Vice President, Power Supply/Generation

Attachment
Enclosure

c: Director, NRC, Region IV, DNMS
C. M. Regan, NRC, NMSS/DSFST
Thomas M. Stoops, ODOE
Controlled Copy Holders

NMSS01

Summary of Changes Incorporated into Revision 8 of PGE-1069, Trojan ISFSI SAR

The changes incorporated into Revision 8 of the Trojan ISFSI SAR were evaluated in accordance with 10 CFR 72.48 and determination was made that prior NRC approval is not required. Changes summarized below are listed by the Licensing Document Change Request (LDCR) number.

LDCR 2006-001: Changes are made to update the SAR to reflect the removal of the Trojan Power Block buildings and miscellaneous structures.

1. Sections 2.2.1, 2.2.3.1, 2.2.3.4, 2.3.3, 4.7.3.1, 4.8, 8.2.13.1.2; Table 4.7-2:
   References to the Trojan Power Block buildings and miscellaneous structures that no longer exist are deleted or wording is added to specify that they previously existed.

2. Section 2.4.1.1; Figure 2.4-2:
   Changes are made to reflect removal of the buildings/structures, and to remove excessive detail in the description of site water drainage.

3. Table of Contents; Sections 2.2.3.3, 3.3.6, 8.2.8, 8.2.14 (deleted), 8.3; Table 4.2-3, Table 8.0-2, Table 8.3-1:
   Due to removal of the Turbine Building, changes are made to delete references to a future Natural Gas Turbine Combined Cycle Power Plant and natural gas pipeline, and the associated accident analysis.

4. Sections 2.1.1, 2.2.3.4; References for Section 2.2:
   Updates the Kelso Airport related information to reflect current planes and numbers, and revises the aircraft impact probability analysis to reflect removal of buildings and structures, including future removal of the Containment Building, based on Holtec Calculation No. HI-2063471, Evaluation of Aircraft Hazards to the Trojan ISFSI (2006).

LDCR 2007-001:
LDCR 2007-002: Changes are made to the SAR to add estimated costs for packaging spent nuclear fuel for shipment, and to adjust cost estimates and projections due to the extended delay in USDOE repository operations.

1. Section 9.8.1.1:
   Since this section contains the first reference in Section 9.8 to the DOE, the full name and acronym for the "US Department of Energy (DOE)" was moved to this section from Section 9.8.1.2.

2. Section 9.8.1.2:
This section is revised to clarify what is included in ISFSI decommissioning costs, and to reflect the extended delay in USDOE repository operations.

3. Section 9.8.2.1:
This section is revised to reflect a $3.7 million increase in the decommissioning cost estimate, which increases the estimated total to $11.6 million, and to correct the timing of the need for funds.

4. Sections 9.8.2.2, 9.8.2.2.1, and 9.8.2.2.3:
These sections are revised to delete wording that infers that decommissioning funds would not be needed to support the projected site preparations and fuel packaging for shipment.

5. Table 9.8-1:
Revised to reflect the $3,722,000 increase in "Transfer Spent Nuclear Fuel and Miscellaneous Costs", which changes the "Total Decommissioning Cost" from $7,853 to $11,575 (thousands of 1997 dollars).

LDCR 2007-003: Changes are made to the SAR to revise the description of the ISFSI Specialist qualifications.

1. Table 9.1-1:
Section 2 is revised to replace the requirement for two years of power plant with one year nuclear power plant experience at the time of appointment, with two years of nuclear facility experience at completion of training for and appointment to the Certified ISFSI Specialist position.

Revision 8 to PGE-1069
Trojan Independent Spent Fuel Storage Installation (ISFSI) Safety Analysis Report (SAR)

Revised pages are to be replaced as follows:

REMOVE	INSERT
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Pages xii through xiv	Pages xii through xiv
Pages xxiii through xxviii	Pages xxiii through xxviii
Section 2	
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Pages 2-12 through 2-15	Pages 2-12 through 2-15
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Page 2-44	Page 2-44
Figure 2.4-2	Figure 2.4-2
Section 3	
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Section 4	
Page 4-49	Page 4-49
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Table 4.2-3, Page 1 of 5	Table 4.2-3, Page 1 of 5
Table 4.7-2	Table 4.7-2
Section 8	
Page 8-31	Page 8-31
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Table 8.0-2, Page 2 of 2	Table 8.0-2, Page 2 of 2
Table 8.3-1	Table 8.3-1
Section 9	
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Table 9.1-1	Table 9.1-1
Table 9.8-1	Table 9.8-1

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Table 4.7-1	0

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Longview, Washington, downstream of the site also has facilities for oceangoing ships. The Port of Longview maintains facilities for unloading and storage of ship cargo. Significant facilities are a bulk loader with storage for 14,000 metric tons of talc; storage tanks with capacity for 40,000 tons of calcinated coke; a grain elevator, currently not in use, with a capacity of 7.8 million bushels; and log storage yards. Among the commodities routinely stored at the port are pencil pitch (or coaltar pitch), ammonia sulfate, and potash. Additionally, at the port Wilson Oil (doing business as Wilcox & Flegel) operates a petroleum bulk plant which has 14 storage tanks with a total capacity of 26,190 barrels of storage (Reference 2).

The Kelso-Longview Airport is 5.3-miles north of the site and has a 4,391-foot paved runway oriented northwest-southeast. The airport is not a scheduled airline stop, but is the base for approximately 80 single and twin-engine, private and corporate aircraft. The airport handles about 18,000 takeoffs and landings per year. The largest planes using the field are a Siddely Hawker, a Cessna Citation, and a Falcon Jet (Reference 5). The Portland International Airport is located 33 statute miles south of the site, and is the only major airport within a 60-mile radius of the site. Portland inbound and outbound air traffic is controlled for a distance of 30 miles from the airport by Portland Air Traffic Control. Area-wide in-flight traffic control is regulated by Seattle Air Traffic Control (Reference 6).

There are no major military bases in the vicinity of the ISFSI site. The nearest military facilities are Reserve Headquarters for the various branches in Portland and Vancouver (30-40 miles south of the site), and Coast Guard and Naval facilities in Portland, Longview and at the mouth of the Columbia River (Reference 7).

A natural gas main extending to Wauna, Oregon, downriver of the site, runs along the hillside west of the site, approximately 1-1/2 miles from the site. The main is a 16 inch, 3-million $foot^3$/hour line, buried a minimum of 3 feet (Reference 8). In addition, there is an odorizer station on the line at Goble, a river crossing at Deer Island, 4-1/2 miles south of the site, and a river crossing at Rainier.

U.S. Highway 30 provides highway access to the ISFSI site and serves as the traffic arterial between Portland and the communities on the Oregon bank of the Columbia River, carrying an average of 5300 vehicles per day (Reference 9). The highway runs through the communities of Scappoose, Warren, St. Helens, Columbia City, Deer Island and Goble, south of the site; and Rainier, Clatskanie, Westport and Astoria north and west of the site. A bridge at Rainier connects U.S. Highway 30 with Longview, Washington, and a bridge at Astoria, the western terminus of the highway, connects to Megler, Washington.

U.S. Highway 26 provides a shorter Portland-to-Astoria route; thus it carries the bulk of traffic between the two, leaving U.S. Highway 30 to carry local passenger traffic, log trucks, tourists, farm vehicles and truck deliveries to the river communities. There is some shipment of

petroleum products via U.S. Highway 30. Gasoline, diesel and heating oils in tank trucks are regularly delivered to towns beyond the site from suppliers in Portland and St. Helens.

Interstate 5 is the primary north-south traffic route between Portland and the Puget Sound area (Seattle, Tacoma, Olympia) carrying an average of approximately 46,000 vehicles per day. Of this total, approximately 20 percent is made up of truck combinations and the remaining 80 percent is passenger traffic (Reference 10). It is estimated that about one-tenth of the truck traffic could be carrying flammable or hazardous material, of which petroleum products would make up the majority.

An average of two freight trains per day pass through the PGE property on the Portland & Western Railroad, Inc. right-of-way, carrying general commodities, with an annual gross tonnage of 6 million tons (Reference 11). Lumber and forest products make up the bulk of the shipping most of the year. During the peak fishing season, some canned and frozen seafood is carried by rail from the Astoria canneries. An average of about 200 shipments per year with 2-3 cars per shipment of chlorine and caustics are shipped to the Georgia-Pacific Corporation in Wauna, Oregon, on the lower river via the Portland & Western line. Other chemicals shipped include preservatives, fertilizer, resins and paints and a small amount of petroleum and propane.

Three railroads use the tracks on the Washington side of the river: Burlington Northern, AMTRAK, and Union Pacific railroads. Thirty-five to forty freight trains and six passenger trains pass the ISFSI site per day on these tracks (Reference 12). The freight carried varies widely with large quantities of wood products, aluminum, paper products, grains, agricultural products and foodstuffs making up the bulk. Chemicals shipped include large quantities of fertilizers, phenols, caustics, propane and various resins, acids, paints and lumber treatments.

Sharply rising ground to the west and similar high ground across the river to the east provide natural barriers for the site. The ISFSI itself is afforded additional protection on the north and east by earthen berms approximately 50 feet high, on the south and west by the buildings ranging from approximately 30 to 45 feet high, and on the south by the 45-foot rise (previous location of cooling tower).

2.2.2 DESCRIPTION OF PRODUCTS AND MATERIALS

Products and byproducts of the timber industry in the area range from unfinished timber to finished construction lumber, cabinetry, plywood and veneer. Some hardwood products are made in Longview on a small-scale operation, while paper and wood fiber products make up a large percentage of the production of the area. Some chemical use and storage is associated with these industries. Chemicals include resins used in plywood, veneer and chipboard production, acids used in paper and pulp production, and lumber pressure treatments and finish coatings (stains and varnishes). Chemicals are stored either in tank cars on sidings, or in storage tanks connected to the industry involved (Reference 13).

The aluminum plant in Longview is an aluminum reduction facility operated by Longview Aluminum which produces raw metal in the form of ingots, billet bars, etc. The use of chemicals at this plant corresponds to that of any aluminum plant; namely coke, pitch, chlorine and liquefied nitrogen. Chemical storage facilities at the plant consist of stockpiles, tanks and rail tankers and transportation is by rail tank cars (Reference 13).

Kalama Chemical, Inc., produces phenols with some secondary production of benzoates. The facility receives its raw material, toluene from tankers and stores it in an 80,000-barrel tank. The finished product is shipped by rail tank car (Reference 13).

Hoechst Celanese Corporation, Inc., is located approximately 3-miles southeast of the ISFSI in Kalama, Washington and produces a bleaching agent used in the pulp and paper industry. The facility receives sulfur dioxide by rail tank car and has a storage capacity for this chemical of 300,000 pounds.

All Pure Chemical Company is located approximately 2-miles southeast of the ISFSI in Kalama, Washington. The company produces a number of products including sodium hypochlorite, household ammonia, and water treatment chemicals. It is involved in the repackaging and distribution of chlorine gas. The chlorine gas is received in 90-ton rail tank cars and is repackaged into 1-ton cylinders. The 90-ton rail tank car is the maximum storage capacity for the chlorine gas at the facility.

A listing of nearby industrial facilities, supplementing the summarization above, is provided as Table 2.2-1. The geographic locations of the nearby industrial facilities are shown on Figures 2.2-1 and 2.2-2.

2.2.3 EVALUATION OF POTENTIAL ACCIDENTS

This section provides an evaluation of the capability of the ISFSI to safely withstand the effects of an accident at, or as a result of the presence of, industrial, transportation and military installations or operations within 5 miles of the site. Potential accidents considered include explosions of chemicals, flammable (including natural) gases or munitions; industrial and forest fires; and accidental releases of toxic gases.

2.2.3.1 Explosions

Shipments of commercial cargo past the site create the possibility of nearby explosions. For the most part, the rugged construction of the Concrete Casks would protect the spent nuclear fuel from such explosions. In addition, the ISFSI would be shielded from the direct force of these explosions by the earthen berms on the north and east, by the buildings to the south and west, and the 45-foot rise (previous cooling tower location) to the south.

ISFSI for operational reasons is not required as in the case for an operating nuclear plant. There are no off-normal events or credible accidents for the ISFSI that require operator action within a prescribed amount of time.

Therefore, a toxic gas event would not affect the safe storage of spent nuclear fuel.

2.2.3.3 Fires

The ISFSI does not require automatic suppression and detection systems because the site specific fire hazards will not exceed the design temperature limits of the Concrete Casks. The fire main, which was installed for 10 CFR 50 fire protection requirements, may be operable for general property insurance requirements of the surrounding buildings, but the fire main is not required or credited for ISFSI fire protection.

Industries and oil storage facilities in the vicinity of the ISFSI are separated from the ISFSI, either by considerable distance or by the Columbia River. Therefore, fires at these facilities would not pose a hazard to the ISFSI.

Fires resulting from transportation accidents on I-5, the railway near I-5, or the Columbia River would be separated from the ISFSI by considerable distance and the Columbia River. Fires from transportation accidents on Highway 30 would be separated from the ISFSI by the recreation lake and reflecting lake. Fires from transportation accidents on the Portland & Western railway would be sufficiently far from the ISFSI to not have an effect on the ISFSI. Therefore, fires from transportation related accidents do not pose a hazard to the ISFSI.

The ISFSI is protected from brush or forest fires on two sides by water, the Columbia River to the east and the recreation lake, reflecting lake and Whistling Swan area to the west. The ISFSI is also afforded localized fire protection by the open area immediately surrounding it.

A fire caused by a rupture of the natural gas main west of the ISFSI would be separated from the ISFSI by a considerable distance and by the intervening lake areas.

In addition to the natural barriers, Columbia River Fire and Rescue provides fire protection services for the site.

A fire caused by a diesel fuel oil spill from a mobile crane or other diesel fuel oil tank at the ISFSI or in the immediate vicinity of the ISFSI would not affect the safe storage of spent nuclear fuel. This type of fire, which is the only credible fire because of the limited number of fire hazards located at the ISFSI itself, would burn for only a few (6-7) minutes. This short burn time would not be sufficient for much heat transfer to the Concrete Cask or MPC and the temperatures of the Concrete Cask and MPC would not be appreciably raised.

The consequences of a forklift fuel (propane) tank explosion and fire are bounded by the diesel fuel oil spill scenario.

Therefore, fires would not affect the safe storage of spent nuclear fuel.

2.2.3.4 Aircraft Impacts

Text Withheld Under 10 CFR 2.390

Text Withheld Under 10 CFR 2.390

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2.2.3.5 Deleted

2.2.3.6 Air Pollutants

Air pollutants are not anticipated at the ISFSI site.

2.3.2.3 Topographic Description

General topography in the vicinity of the ISFSI site is shown in Figure 2.1-2. Topographical cross sections out to 10 miles are provided in Figures 2.3-1 through 2.3-6.

The ISFSI site is located in the Columbia River Valley, which at this location is in a general north-south orientation. North of the site the Columbia River bends to the northwest, and south of the site the river bends to the southeast. Within the immediate vicinity of the site, there is a bluff one-half mile to the west rising sharply to 400-500 feet with a highest peak of 1187 feet MSL. North of the ISFSI, there is a wooded hill which rises to 100 feet. The remaining area in the immediate vicinity of the site is flat and low. The Columbia River Valley is approximately 2 miles wide at the site and widens to 3 miles north of the site at Longview-Kelso. The valley walls at the site rise to an elevation of 1000 feet MSL within approximately 1.8 miles to the west and not quite so high to the east.

The effect of the topographic features on airflow trajectory regimes and dilution is quite significant at the site. Analyses of annual wind roses reveal that the predominant wind flow is in a north-south direction. Winds within the Columbia River Valley will be effectively channeled and therefore will follow the changing orientations of this Valley. Computations of average χ/Q values based on the straight line model for a ground-level release indicate that the greatest potential concentrations would be north and south of the site, corresponding to the predominant wind directions. In addition, a nonbuoyant plume will generally not rise out of the valley for a ground-level release during stable temperature lapse rate conditions. Estimates of dispersion during stable conditions, based on the Gaussian diffusion model, indicate that a plume oriented in a general north-south direction would most likely not intersect with the valley walls. Therefore, the valley walls have only a limited effect as a potential barrier to prevent dispersion of the plume since the width of the valley increases both to the north and south of the site and the plume width is relatively narrow during stable conditions. Turbulence created by the mountainous terrain would increase the dilution of airborne effluents.

2.3.3 ONSITE METEOROLOGICAL MEASUREMENTS PROGRAM

The onsite meteorological program at the site began in October 1969 with wind and temperature instrumentation at four elevations: one 500-foot tower plus a 30-foot satellite tower on the bank of the Columbia River. To more accurately define low wind speed conditions, a Climet system was installed on a 33-foot tower located along the site access road. In addition, one 11-inch rain gauge was installed west of the previous Turbine Building.

Meteorological data were collected during nuclear plant operation and for a time during defueled operation, but data will not be collected during ISFSI operation. The source terms for ISFSI operation are much lower than the source terms for nuclear plant operation. Accidents and off-normal events do not result in releases that would exceed 10 CFR 72.106 limits and OAR 345-026-0390. As a result, meteorological monitoring for the calculation of off-site doses

The ISFSI site has excellent drainage. The east side of the rocky ridge drains directly into the Columbia River, while runoff on the west side flows into the old river channel and thence by Carr Slough northward until it joins the Columbia River. Neer Creek, a small stream, flows off the steep hillside west of the site and old river channel. Its flow varies from over 30 cfs at times during the winter to essentially zero during dry summer periods. Neer Creek provides flow through the recreational lake with the outflow passing into Carr Slough as it did prior to construction of the Trojan Nuclear Plant.

The northern, unpaved area of the PGE property drains to the perimeter drainage ditch, which is approximately 3 feet lower than the ground elevation of the PGE property. This ditch drains to the reflecting lake, and the south drainage ditch empties into the recreational lake as shown on Figure 2.4-2. The on site PGE property is sloped so that water drains either to a drainage ditch, toward the river, or toward the southwest, away from the ISFSI.

2.4.1.2 Hydrosphere

The Columbia River is the major hydrographic feature in the area. It represents one-third of the potential hydropower of the United States, and has an annual discharge of approximately 180,000,000 acre-ft (59 trillion gallons), and drains an area of 260,000 square miles (Reference 1). The Columbia River has an average flow rate of 230,000 cfs at the site with a corresponding average current velocity of 1.8 fps.

A most important factor in considering flows in the Columbia River is the large amount of storage available for flood control and power use. With the dams constructed in the United States and Canada by 1973, more than 30 million acre-ft of storage (Reference 2) is usable in controlling floods on the lower Columbia River.

Tidal effects on the Columbia River can be seen as far upstream as Bonneville Dam, at River Mile 140. The tides at Astoria are typical of the Pacific Northwest tidal pattern. The tides are of a semidiurnal nature with an average period of approximately 12.4 hours.

The effect of tides at the site is dependent to a large part on the flow of the river at the time. Flow reversal occurs at the site on about one-quarter of the tides during a normal year. The extreme tidal range at the site is less than 5 feet, and a maximum upstream flow of 129,000 cfs with an average current velocity of 1.3 fps. The Columbia River has five significant tributaries near the site. None is large enough to have serious effect upon the hydrology at the site.

REFERENCES FOR SECTION 2.2

1. Telecon No. WRN-T15-92, W. R. Nehrenz to D. Hefty, Merchant's Exchange.

2. Telecon No. WRN-T38-92, W. R. Nehrenz to K. Barney, Port of Longview.

3. Telecon No. WRN-T19-92, W. R. Nehrenz to S. Perkins, U.S. Army Corps of Engineers.

4. Corps of Engineers, Portland.

5. Merrill Beck, Kelso-Longview Airport Manager, Telecon and Meeting (January 2006).

6. Federal Aviation Administration (1972).

7. U.S. Department of Defense (1972).

8. Northwest Natural Gas Company. (1972).

9. Telecon No. WRN-T20-92, W. R. Nehrenz to H. Nale, Oregon Department of Transportation, Planning Section.

10. Telecon No. WRN-T21-92, W. R. Nehrenz to J. Sorrell, Washington Department of Transportation, District 4 Traffic Office.

11. Ken Pellens, Roadmaster, Burlington Northern Railroad (now known as Portland & Western Railroad, Inc.), Telecon (June 1992).

12. John Myers, Train Master Vancouver Office, Burlington Northern Railroad (June 1992).

13. Survey Conducted by PGE in Trojan Area (1972).

14. Holtec Report No. HI-2002444, Final Safety Analysis Report for the HI-STORM 100 System, Revision 1.

15. Holtec Calculation No. HI-2063471, Evaluation of Aircraft Hazards to the Trojan ISFSI (2006).

Figure Withheld Under 10 CFR 2.390

TROJAN ISFSI
SAFETY ANALYSIS REPORT

FIGURE 2.4-2
ISFSI SITE DRAINAGE

design results in an average external side surface dose (gamma and neutron) of less than 100 mrem/hr on the sides and 300 mrem/hr on the top and at the air vents.

Expected dose rates associated with ISFSI operations are contained in Section 7.4.

3.3.5.3 Radiological Alarm Systems

The Concrete Cask system does not produce routine solid, liquid, or gaseous effluents. Section 8.1.3 discusses an inadvertent release of surface contamination from the exterior of the MPC. The consequences of this event are negligible (2.50 mrem at 100 meters). Therefore, an alarm for airborne radioactivity is not required to protect personnel or the environment.

As discussed in Chapter 7, the estimated working dose rate for the Concrete Cask (maximum fuel burnup) is 9.9 mrem/hr and the highest dose rate at 100 meters from the edge of the ISFSI Storage Pad is calculated (based on the entire ISFSI uniformly loaded with design basis fuel assemblies) to be 0.18 mrem/hr. These dose rates do not warrant a radiation alarm to protect personnel or the environment.

Based on the above, radiological alarms are not required for the Trojan ISFSI.

3.3.6 FIRE AND EXPLOSION PROTECTION

The potential for fires at the ISFSI are minimized by the use of paved open areas and minimum combustible materials within the ISFSI security fence. As discussed in Section 2.2.3.3 the facility is well protected from industrial and forest fires by natural barriers. Section 8.2.9 provides additional discussion on fires.

Explosion analyses for the ISFSI are presented in Section 8.2.8.

3.3.7 MATERIALS HANDLING AND STORAGE

3.3.7.1 Spent Fuel Handling and Storage

The loading of each MPC is limited to the design basis maximum decay heat load limit shown in Table 3.1-3 (Reference 8). The Trojan Storage System is designed to accommodate the design basis maximum decay heat load and maintain fuel cladding temperature below limits established for inert dry storage (Reference 4). In addition, temperature limits for storage system components are also maintained below design limits. The Technical Specifications establish surveillances to preclude exceeding material design temperature limits.

The fuel clad temperature limit is a function of fuel burnup, fuel pin fill gas pressure, and fuel age. For the Trojan ISFSI, the fuel clad temperature limit is shown in Table 3.1-3. This limit was determined using Westinghouse 17x17 fuel with a limiting combination of cooling time and

In the previous Fuel Building, the Transfer Cask was lifted from above by a Lifting Yoke via two lifting trunnions located on the outer shell. The lifting trunnions consist of a threaded cylindrical trunnion screwed into a trunnion block that is welded to the inner and outer shell of the Transfer Cask. The lifting trunnion assemblies are solid steel and extend radially from the Transfer Cask body. Each trunnion block is welded to the inner and outer steel shells of the Transfer Cask wall with partial penetration welds. The two lifting trunnions are capable of accommodating the combined weight of the Transfer Cask and a fully loaded wet MPC (for Transfer Cask use during initial cask loading) while meeting the guidance of NUREG-0612. The lifting trunnions are fabricated in accordance with ANSI N14.6 requirements and are tested to 300 percent of their maximum design load.

Figure 4.7-1 provides a description of the Transfer Cask. Figure 4.7-2 provides a description of the lifting trunnions.

4.7.3.2 Transfer Station

The ISFSI is designed as a stand alone facility, and is equipped with a Transfer Station to support dry transfer operations. The Transfer Station is important to safety and designed for Seismic Margin Earthquake (SME) ground motions applied in any direction. The structural steel Transfer Station allows a Concrete Cask or Transport Cask to be positioned under the Transfer Cask for MPC transfers. A collar inside the station is clamped around the Transfer Cask approximately at the height of its center of gravity and locked in place to stabilize the Transfer Cask during handling operations. Transfer operations are discussed in Section 5.3. The use of the Transfer Station restricts the potential handling accidents to those analyzed in Section 8.2.13.3.

A summary of the Transfer Station fabrication specifications is provided in Table 4.7-1. Figure 4.7-3 provides a description of the Transfer Station.

4.7.3.3 Air Pad System

A commercially available air pad system will be utilized for moving the Concrete Casks on the Storage Pad. The air pad system consists of four individual air pads approximately 48 inches square. In order to insert the air pads under the Concrete Cask, the inlet air screens must be removed. The air pads are positioned under the Concrete Cask in the air inlet channel area and pressurized. The effective lift height of the air pads is approximately 3 inches. The Concrete Cask can then be moved to the desired location where the air pads are depressurized and removed. The air inlet screens can then be reinstalled.

4.7.3.4 MPC Lift Cleats

The top of the MPC lid is equipped with four threaded holes that allow the loaded MPC to be raised/lowered through the Transfer Cask using two lift cleats. The lift cleat assemblies consist of the cleats and attachment hardware. The lift cleats are important to safety components supplied as solid steel components that contain no welds. The lift cleats are used to support and

Concrete Cask

The operating environments the Concrete Cask experiences are limited by the areas to which the Concrete Cask can be moved. Concrete Cask movements are limited to areas accessible by the ISFSI roadways. These areas include the ISFSI foundation (Storage, Service, and Transfer Station Pads), connecting roadways in the general yard area, and during initial cask loading operations, the previous Fuel Building crane bay. The Concrete Cask is exposed to ambient conditions outside the previous Fuel Building.

The Concrete Cask is fabricated from concrete (exterior shell) and carbon steel (liner assemblies, shield ring, concrete reinforcement, lid, galvanized fasteners, miscellaneous plates). The Concrete Cask also uses components manufactured from stainless steel (screens, anchors, lock wire, nameplate, miscellaneous plates), viton (lid gasket), CarboZinc (carbon steel coating), and ceramic tiles. A description of materials is provided on the Concrete Cask drawing in Chapter 1.

The concrete in the cask shell is in direct contact with carbon steel through reinforcing bars, liner assembly, etc., and stainless steel through the inlet screens, nameplate, etc. Concrete has been used with carbon and stainless steels in many commercial applications including Reactor Containment Buildings (e.g., carbon steel reinforcement, stainless steel liner). No adverse chemical or galvanic interactions are anticipated in this application. Similarly, as concrete is a standard construction material used for civil projects such as dams, buildings and bridges that are exposed to severe environmental conditions, no adverse concrete reactions associated with weather are anticipated.

Carbon steel surfaces on the cask that would otherwise be exposed to ambient conditions (such as the cask liner, lid, etc.) have been coated with an inorganic zinc-rich coating that provides galvanic protection against corrosion of the steel. Consequently, significant steel corrosion is not anticipated. The Concrete Cask drawing includes the specific coating material used. No stainless steel surfaces in the cask other than small nonstructural fasteners are in direct contact with carbon steel parts used elsewhere in the cask. In order to prevent the carbon steel liner from coming in direct contact with the stainless steel MPC baseplate, ceramic tiles are arranged around the liner base to act as an insulator between the two steels. Therefore, no galvanic interaction between carbon and stainless steels is anticipated during cask operation.

Some stainless steel parts such as the inlet air screens will be exposed to ambient conditions. However, due to the chemical nature of stainless steels, no significant chemical or galvanic reactions with moist air, rain, etc., are anticipated.

The viton lid gasket is compressed between the coated liner flange and cask lid, with potential contact with the galvanized lid bolts. As with a pressure piping joint insulating kit, the viton acts as an insulator between these materials. No chemical or galvanic reactions involving viton are anticipated.

Table 4.2-3

Conformity to Requirements

Requirement	Requirement Summary	Basis for Conformance
10 CFR 72.122(a) Quality Standards	Structures , systems, and components important to safety must be designed tested and fabricated to quality standards commensurate with their function	Quality assurance program in accordance with 10 CFR 72.104(d) implemented for ISFSI activities. Refer to SAR Chapter 11.
10 CFR 72.122(b) Protection Against Environmental Conditions and Natural Phenomena	Structures , systems, and components important to safety must be designed to accommodate the effects of and be compatible with site characteristics and to withstand postulated accidents	SAR Chapter 2 describes the site characteristics and defines credible environmental conditions. SAR Chapter 8 provides analysis to demonstrate design conformance.
OAR 345-026-0390(4)(b)	The ISFSI shall be designed such that in the event of a Seismic Margin Earthquake, anticipated damage to spent nuclear fuel or containers will not preclude acceptance at federally licensed disposal facility.	SAR Section 8.2.5.2 demonstrates that Seismic Margin Earthquake does not result in damage to storage system
10 CFR 72.122(c) Protection Against Fire and Explosions	Structures , systems, and components important to safety must be designed and located so that they can continue to perform their safety function under credible fires and explosion exposure conditions	SAR Section 8.2.9 discusses impact of fire on the ISFSI, Section 8.2.8 discusses explosions
10 CFR 72.122(d) Sharing of Structures and Components	Structures, systems, and components important to safety must not be shared between the ISFSI or other facilities unless it is shown that such sharing will not impair the capability of either facility to perform its safety function.	The ISFSI is designed for stand alone operations and does not rely on other facilities to support performance of its safety function. The ISFSI does not share its facilities with any other facility.

Table 4.7-2

Transfer Cask Lift Components[1]

Component		Safety Factor	ANSI N14.6 Non-Critical	ANSI N14.6 Critical
Trunnion	yield	8.2	3	6
	ultimate	10.2	5	10
Shield Door Rail Bottom Plates	yield	7.7	3	6
	ultimate	15.5	5	10
Shield Door Rail Lower Welds	yield	10.9	3	6
	ultimate	22.0	5	10
Shield DoorRail/ Transfer Cask Shell Weld	yield	6.4	3	6
	ultimate	13.0	5	10

Component		Stress/Force	AISC Allowable
Top Lid	bending	8.77 ksi	26.0 ksi
Bolts	tension	10.3 kips	25.0 kips

[1] For lifts in the previous Fuel Building. The Transfer Cask is not used for lifting at the ISFSI.

8.2.7.3 Accident Dose Calculations

There are no radiological releases or adverse radiological consequences from this event.

8.2.8 EXPLOSIONS OF CHEMICALS, FLAMMABLE GASES, AND MUNITIONS

This analysis addresses the hazards posed by potential explosions on transportation routes and in the vicinity of the ISFSI.

8.2.8.1 Cause of Accident

As presented in Section 2.2.3.1, the only source of potential explosions near the Trojan site that could affect safety related structures is shipment of commercial explosive cargo near the plant. Trojan plant structures and the ISFSI site itself contain no significant amounts of explosive materials. The small quantities of gasoline or fuel oil that may be contained in the fuel tanks of vehicles (e.g., forklifts and mobile cranes) or standby power supply engines near the ISFSI present an insignificant explosion hazard. Explosions unrelated to transportation are not considered significant. Refer to Section 2.2.3.1 for additional information on potential sources of explosions in the vicinity of the site.

In addition, as discussed in Section 2.2.3.1, the probabilities of a disabling accident involving a rail or barge shipment explosion that causes a 2.2 psi overpressure are less than 10^{-6} per year each.

8.2.8.2 Accident Analysis

As noted in Section 2.2.3.1, the maximum anticipated transportation-related explosion overpressure at the plant site is 2.2 psi. Considering reflected shock waves from a detonation on a nearby transportation route, the resulting overpressure may increase by a factor approaching two. An overpressure of 4.4 psi is conservative for an analysis of the ISFSI Concrete Casks. As noted above, the explosion hazard from activities at the ISFSI site is insignificant.

The Concrete Casks have been shown in Section 8.2.4 to withstand a tornado wind pressure of 331.8 psf (or 2.3 psi) and missile impacts without sliding or overturning. The magnitude of explosion that would result in overturning or sliding of a Concrete Cask was determined as follows:

The force required to slide a Concrete Cask is:

$$F_{slide} = W_{cask} \times 0.3 = 292{,}700 \text{ lbs} \times 0.3 = 87{,}810 \text{ lbs}$$

Adapter plates are used in the top of the Concrete Cask and Transport Cask that mate with the Transfer Station stops for accurate horizontal positioning. The Transfer Station shield ring, when lowered into position for MPC transfer, mates with the Concrete Cask or Transport Cask adapter plate such that the inside diameter of the Concrete Cask or Transport Cask, the inside diameter of the shield ring, and the inside diameter of the Transfer Cask are aligned. With these alignment design features, interferences during MPC movements are not likely to occur. The following events are analyzed, however, in order to bound any similar events.

8.2.13.1 Interference During Raising or Lowering the MPC

The MPC catches on the Transfer Cask while being moved. While proper procedures to ensure alignment of the components should prevent this condition from occurring, it is analyzed nevertheless to bound similar occurrences.

8.2.13.1.1 Cause of Accident

The cause is operator error for failing to assure adequate clearance and/or alignment.

This event may be detected by audible noise emitted by the MPC as it contacts the Transfer Cask or visually by upward movement of the Transfer Cask.

8.2.13.1.2 Accident Analysis

The locations where the MPC is moved relative to the Transfer Cask are the previous Fuel Building, at elevation 45 ft., while loading the MPC into the Concrete Cask, or at the Transfer Station during movements between a Concrete Cask or Transport Cask.

At the Transfer Station, an impact limiter which is designed to preclude unacceptable damage to the fuel is located beneath the receiving cask. No damage to the fuel would occur in the unlikely event of a failure in the lifting system.

8.2.13.1.3 Accident Dose Calculation

There are no radiological releases or adverse radiological consequences from this event.

8.2.13.2 Interference During MPC Lowering into a Concrete Cask or Transport Cask

The MPC catches on the Concrete Cask or Transport Cask edge or side while being lowered into a Concrete Cask or Transport Cask.

While proper procedures to ensure alignment of the components should prevent this condition from occurring, it is analyzed nevertheless to bound similar occurrences.

HI-TRAC Transfer Cask into a HI-STAR 100 Transport Cask or Concrete Cask at the Transfer Station satisfy the acceptance criteria.

8.2.13.3.4 Accident Dose Calculation

There are no radiological releases or adverse radiological consequences from this event.

8.2.13.4 Loaded Transport Cask Drop

A vertical or horizontal drop of a loaded Transport Cask is speculated to occur during transfer to a heavy-haul trailer or rail car prior to the installation of transportation packaging impact limiters.

Section 9.7.5 establishes that a program provide the requirements governing handling or lifting fuel bearing components including Transport Casks. Handling/lifting of spent fuel or handling/lifting of loads over spent fuel are performed only in accordance with approved lift plans. An evaluation of consequences of a drop or handling accident shall be performed prior to initiating the handling/lifting activities.

In accordance with the program described in Section 9.7.5, an evaluation to criteria equivalent to those specified in NUREG-0612 will be performed of the entire fuel transfer and loading process. Handling of the Transport Cask at the ISFSI could utilize increased safety factors in the rigging to preclude drops or impact limiters to mitigate the effects of drops prior to installation of the transportation packaging.

8.3 SITE CHARACTERISTICS AFFECTING SAFETY ANALYSIS

The ISFSI site is located as depicted in Figures 2.1-1 and 2.1-2. The installation accommodates 34 loaded Concrete Casks and its layout is shown in Figure 2.1-3. The loaded Concrete Casks reside on a thick concrete slab with fifteen feet center-to-center spacing and an aisle through the middle of the array. The Controlled Area for the ISFSI site is shown on Figure 2.1-2. The ISFSI site is well shielded by an embankment on the north and east sides. Figure 2.1-2 shows the accessibility of the site to truck, rail, and barge transportation. Section 2.2.3 notes that the nearest natural gas line is approximately 1.5 miles from the site; operation of this gas line will not present a hazard to the ISFSI from explosion because of the distance from the site.

Site characteristics that affect the safety analysis are summarized in Table 8.3-1.

8.4 REFERENCES

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17. Holtec Report No. HI-2012676, "Thermal-Hydraulic Calculations for Trojan ISFSI Completion Project," Revision 8.

18. Holtec Report No. HI-2012677, "Trojan ISFSI Site Boundary Confinement Analysis," Revision 5.

Table 8.0-2

Design Basis and Beyond Design Basis Infrequent (Accident) Events

Design Basis and Beyond Design Basis Infrequent (Accident) Events	**MPC Press. Boundary**	**MPC Basket**	**Concrete Cask**
10. Volcanism	-	-	X
11. Lightning	-	-	X
12. Off-Site Shipping Events a. Interference During Raising the MPC from Concrete Cask into Transfer Cask b. Interference During MPC Lowering into a Concrete Cask or Transport Cask.	X	-	X
c. MPC Drop Into Concrete or Transport Cask d. Loaded Transport Cask Drop	X	X	-

Table 8.3-1

Summary of Site Characteristics Affecting the Safety Analysis

Site Characteristic	Effect on ISFSI Safety Analysis
Severe environmental conditions in summer and winter	Evaluation of steady state Concrete Cask, MPC, and fuel temperatures for 100°F ambient temperature with 24 hour average solar loads and -40°F ambient temperature with no solar load
Tornadoes	Evaluation of possible Concrete Cask damage including overturning due to wind loading, failure of confinement due to pressure differential, and impact damage due to tornado generated missiles
Earthquakes	Evaluation of seismic motion including possible overturning
Explosion of Chemicals, Flammable Gases, and Munitions	Evaluation of effects on Concrete Cask including potential overturning and sliding
Fires	Evaluation of potential for fire hazard at the ISFSI site
Volcanism	Evaluation of the effects of potential ash, mud and flooding caused by a volcanic eruption
Lightning	Evaluation of the impact of a postulated lightning strike

9.8 ISFSI DECOMMISSIONING PLAN

In accordance with 10 CFR 72.30 (Reference 1), this section describes the plan for decommissioning the ISFSI. As required by 10 CFR 72.30(a), this Trojan ISFSI Decommissioning Plan contains sufficient information on proposed practices and procedures for the decontamination of the site and facilities and for disposal of residual radioactive materials after all of the MPCs and their contents have been removed, in order to provide reasonable assurance that the decontamination and decommissioning of the ISFSI at the end of its useful life will provide adequate protection to the health and safety of the public. This plan also discusses those design features of the ISFSI that facilitate its decontamination and decommissioning at the end of its useful life.

In accordance with 10 CFR 72.30(b), the Trojan ISFSI Decommissioning Plan as incorporated into this section also details how reasonable assurance will be provided that funds will be available to decommission the ISFSI. This information includes a cost estimate for decommissioning the Trojan ISFSI and a description of the methods from 10 CFR 72.30(c) that the Trojan ISFSI co-owners will use to assure adequate funds for decommissioning, including means of adjusting the cost estimate and associated co-owner funding levels periodically over the life of the ISFSI.

9.8.1 DECOMMISSIONING ACTIVITIES AND SCHEDULE

9.8.1.1 Decommissioning Activities

The ISFSI was designed to minimize the decontamination efforts required for decommissioning pursuant to the requirements of 10 CFR 72.130 (Reference 2). As discussed in Section 3.5, the design of the MPC and the operational process for handling the MPC during Storage and Transfer Station operations ensure that the radioactive materials are contained within the sealed MPC, which minimized the potential for contamination of the ISFSI components and structures. Thus, decommissioning of the ISFSI primarily consists of transferring the spent nuclear fuel contained in the sealed MPCs to a facility for final disposal or storage.

After the spent nuclear fuel is transferred to the US Department of Energy (DOE) for disposal or storage, contamination and radiation surveys will be performed to determine if the ISFSI is contaminated or if ISFSI components are activated. As indicated in Section 3.5 and Table 4.2-3, no contamination is expected on the Concrete Cask and because of low neutron flux levels, no significant activation of the concrete and steel is anticipated. However, even if contamination were detected, decontamination would be accomplished by routine radiation protection practices. The resultant radioactive waste would be packaged and shipped off site as radioactive waste. Similarly, even if the ISFSI components were found to be significantly activated, the activated components would be packaged and shipped off site as radioactive waste.

9.8.1.2 Decommissioning Schedule

The DOE is responsible for the acceptance of spent nuclear fuel and related nuclear material in accordance with the terms of the 1982 Nuclear Waste Policy Act. The PGE contract with DOE, "Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste," provides the basis for the schedule forecast in DOE's annual acceptance priority ranking for receipt of spent nuclear fuel and/or high-level radioactive waste. Previously, the published schedule specified that the first shipment of Trojan spent nuclear fuel was to have been in 2002, and PGE projected the final shipment to be in 2018. The DOE schedule published in July 2004 used 2010 for commencing Repository operations and changed the first shipment date for Trojan fuel to 2013. This schedule did not specify a projected date for the final Trojan fuel shipment (the schedule covers only 587 of the 791 spent fuel assemblies). PGE projected the July 2004 schedule out to cover the remaining 204 fuel assemblies and arrived at 2023 as being the estimated date of the final shipment. ISFSI decommissioning costs include the cost of removing the MPCs from storage and packaging them for shipment. ISFSI facility decommissioning will occur following the last spent fuel shipment. In February 2007, the DOE established March 2017 as their new key milestone for commencing Repository operations, which is a seven-year delay from year 2010. Using the same modeling assumptions, PGE used this seven-year delay in DOE's schedule to project and estimate a new first fuel shipment date of 2020, a final fuel shipment date of 2030, and ISFSI facility decommissioning in 2031. The decommissioning cost estimate and funding plan are based on the assumption that decommissioning will be completed in 2031. This delay in decommissioning will also require continued funding of ISFSI operations and maintenance from 2018 to 2030. Annual operations and maintenance costs are estimated at approximately $3.7 million per year (in 1997 dollars).

9.8.2 TROJAN ISFSI DECOMMISSIONING COST ESTIMATE AND FUNDING PLAN

9.8.2.1 Decommissioning Cost Estimate

Summarizing the results of the Trojan ISFSI cost estimate, Table 9.8-1 provides a breakdown of estimated decommissioning costs based on anticipated decommissioning activities. As indicated in Table 9.8-1, the total cost (in 1997 dollars) for decommissioning the ISFSI is estimated at approximately $11.6 million. As indicated in Section 9.8.1.2, these expenditures are currently scheduled to require funding from 2020 through 2031 to support packaging of spent fuel for shipment and ISFSI decommissioning.

The methodology used to develop the cost estimate followed the approach presented in AIF/NESP-036, "Guidelines to Producing Decommissioning Cost Estimates" (Reference 3) and the DOE "Decommissioning Handbook" (Reference 4). These guidance documents utilize a unit cost factor method for estimating decommissioning activity costs. Unit cost factors incorporate site-specific considerations whenever practicable.

In accordance with 10 CFR 72.30(b), the Trojan ISFSI decommissioning cost estimate and associated funding levels are adjusted over the life of the ISFSI as determined to be necessary as

part of and on a schedule consistent with Oregon Public Utility Commission (OPUC) rate cases. Since decommissioning of the ISFSI primarily consists of transferring the contents of the sealed MPCs to an off-site facility for final disposal or storage (see Section 9.8.1.1), decommissioning cost estimate adjustments likely would be necessary only upon receipt of any new information indicating that the current co-owner funding levels are no longer adequate to cover decommissioning costs. Such information could include major changes to the timing of decommissioning and associated decommissioning fund expenditures, the scope of Transport Cask loading operations, and/or DOE repository receipt requirements.

9.8.2.2 Decommissioning Funding Plan

Each of the Trojan ISFSI co-owners separately collects through rates the funds for the decommissioning of the Trojan ISFSI. PGE and PP&L deposit these funds in external trust funds in accordance with 10 CFR 50.75(e)(1)(ii) (Reference 5) as allowed by 10 CFR 72.30(c)(5) (Reference 1) together with an NRC partial exemption dated March 17, 2005 (Reference 7). The BPA provides EWEB's portion of Trojan ISFSI decommissioning funds as necessary as described in Section 9.8.2.2.2. Each co-owner maintains a decommissioning fund collection schedule which ensures that sufficient funds are collected and available to fully fund its portion of total decommissioning activity expenditures. As discussed above, in accordance with 10 CFR 72.30(b), the Trojan ISFSI co-owners periodically assess and adjust, as necessary, the financial assurance amount required to complete Trojan ISFSI decommissioning. The manner in which each co-owner provides funding and financial assurance for Trojan ISFSI decommissioning is detailed below.

9.8.2.2.1 PGE Funding

As a majority co-owner in the Trojan ISFSI, PGE is responsible for funding 67.5 percent of the total ISFSI decommissioning costs specified in Section 9.8.2.1. As allowed by 10 CFR 72.30(c)(5) and a related NRC partial exemption (Reference 7), PGE provides ISFSI decommissioning funding assurance using the method of 10 CFR 50.75(e)(1)(ii). Specifically, PGE has established and maintains an external sinking fund in the form of a trust, which is segregated from PGE's assets and outside PGE's administrative control, and into which funds are periodically set aside such that the total amount of funds will be sufficient to pay decommissioning costs. As allowed by 10 CFR 50.75(e)(1)(ii)(A) for licensees such as PGE that recover the total estimated decommissioning costs through ratemaking regulation, this method is the exclusive mechanism that PGE relies upon to provide financial assurance for Trojan ISFSI decommissioning. In accordance with the NRC partial exemption dated March 17, 2005 (Reference 7), in the future, if funds remaining to be placed into PGE's external sinking fund to cover PGE's 67.5 percent ownership share of Trojan ISFSI decommissioning costs are no longer approved for recovery in rates by a competent rate regulating authority (currently OPUC), the subject exemption will be considered no longer effective. In such an event, PGE would no longer be allowed to use the financial assurance mechanisms of 10 CFR 50.75(e), but rather would be required to use financial assurance methods as specified in 10 CFR 72.30(c).

9.8.2.2.2 EWEB/BPA Funding

BPA is obligated through Net Billing Agreements to fund EWEB's 30 percent share of the total Trojan ISFSI decommissioning costs as specified in Section 9.8.2.1. As allowed by 10 CFR 72.30(c)(4), BPA, as a Federal government entity fulfilling the decommissioning funding obligations of EWEB, a licensee, provides financial assurance in the form of a statement of intent. The statement of intent contains a reference to the Trojan ISFSI decommissioning cost estimate, indicating that funds for radiological decommissioning of the Trojan ISFSI will be obtained when necessary.

9.8.2.2.3 PP&L Funding

PP&L is responsible for funding its share – 2.5 percent – of the total ISFSI decommissioning costs specified in Section 9.8.2.1. As allowed by 10 CFR 72.30(c)(5) and a related NRC partial exemption (Reference 7), PP&L provides ISFSI decommissioning funding assurance using the method of 10 CFR 50.75(e)(1)(ii). Specifically, PP&L has established and maintains an external sinking fund in the form of a trust, which is segregated from PP&L's assets and outside PP&L's administrative control, and into which funds are periodically set aside such that the total amount of funds will be sufficient to pay decommissioning costs. As allowed by 10 CFR 50.75(e)(1)(ii)(A) for licensees such as PP&L that recover the total estimated decommissioning costs through ratemaking regulation, this method is the exclusive mechanism that PP&L relies upon to provide financial assurance for Trojan ISFSI decommissioning. In accordance with the NRC partial exemption dated March 17, 2005 (Reference 7), in the future, if funds remaining to be placed into PP&L's external sinking fund to cover PP&L's 2.5 percent ownership share of Trojan ISFSI decommissioning costs are no longer approved for recovery in rates by a competent rate regulating authority (currently OPUC), the subject exemption will be considered no longer effective. In such an event, PP&L would no longer be allowed to use the financial assurance mechanisms of 10 CFR 50.75(e), but rather would be required to use financial assurance methods as specified in 10 CFR 72.30(c).

9.8.3 RECORD KEEPING FOR DECOMMISSIONING

Records of information important to the safe and effective decommissioning of the ISFSI will be maintained for the life of the ISFSI. The types of information that will be maintained as records for decommissioning are listed in 10 CFR 72.30(d).

TABLE 9.1-1

ISFSI Staffing Qualifications
Operation Organization

1. <u>ISFSI Manager</u>:

The ISFSI Manager, at the time of appointment to the position, shall have a minimum of eight years of power plant experience, of which a minimum of three years shall be nuclear power plant experience. A maximum of two years of the remaining five years of power plant experience may be fulfilled by satisfactory completion of academic or related technical training on a one-for-one basis. The ISFSI Manager will be trained and certified in accordance with the Trojan Certified ISFSI Specialist Training Program (PGE-1072), and shall meet or exceed the minimum qualifications of ANSI N18.1-1971 for a comparable position.

In addition to the above specified requirements, the ISFSI Manager will also be required to be qualified as an Independent Safety Reviewer (ISR). The qualifications for an ISR are provided in Section 9.6.1.

2. <u>ISFSI Specialists</u>:

The ISFSI Specialists, at the time of appointment to the position, shall have a High School diploma or successfully completed the General Education Development (GED) test. Consistent with the assigned duties, ISFSI Specialists will be trained and certified in accordance with the Trojan Certified ISFSI Specialist Training Program (PGE-1072) and the Trojan ISFSI Security Plan (PGE-1073) training and qualification requirements, and shall meet or exceed the minimum qualifications of ANSI N18.1-1971 for a comparable position. At the time of completion of training and appointment to the position, the Certified ISFSI Specialist shall have a minimum of two years of nuclear facility experience.

TABLE 9.8-1
ISFSI Decommissioning Costs

ACTIVITY	ESTIMATED COST (thousands of 1997 dollars)
Demolition of ISFSI	417
Transfer Spent Nuclear Fuel and Miscellaneous Costs	6,735
Professional Services	750
Burial Cost, Low Level Waste[1]	3,673
Total Decommissioning Cost	11,575

[1] Separate burial of the Concrete Casks as Low Level Radioactive Waste.