INSTRUCTION SHEET

The following information is provided as a guide for the insertion of new sheets for changes to the "Trojan Independent Spent Fuel Storage Installation Technical Specifications", dated November 25, 1996.

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INDEPENDENT SPENT FUEL STORAGE INSTALLATION

TECHNICAL SPECIFICATIONS

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4.0 DESIGN FEATURES

4.1 SITE

The Trojan Independent Spent Fuel Storage Installation (ISFSI) is located at Trojan Nuclear Plant (TNP) site in Columbia County, Oregon, approximately 42 miles north of Portland, Oregon

4.2 NUCLEAR HANDLING AND STORAGE DESCRIPTION

4.2.1 General Description

The major storage and handling components of the Trojan ISFSI are:

a) A concrete pad (170' x 100') with capacity to store up to 36 CONCRETE CASKS.
b) PWR BASKETS that can accommodate up to 24 spent nuclear fuel assemblies.
c) GTCC BASKETS that will store the Greater Than Class C material.
d) CONCRETE CASKS that provide the shielding and missile protection for the PWR and GTCC BASKETS.
e) A TRANSFER CASK utilized for transferring the loaded BASKETS from the spent fuel pool cask load pit to the CONCRETE CASKS and eventually into a SHIPPING CASK.
f) A TRANSFER STATION utilized to move a PWR or GTCC BASKET from one cask to another or to a SHIPPING CASK.

4.2.2 Spent Nuclear Fuel

There are 780 spent fuel assemblies to be stored at the Trojan ISFSI which meet the characteristics specified in Table 4-1. The heat load of the fuel assemblies stored in a BASKET will be limited to 24 KW.

4.2.3 Failed Fuel

There are ten (10) partial fuel assemblies and one (1) fuel rod storage container containing intact, suspect, or failed fuel rods which will be stored in failed fuel cans.

4.3 STORAGE COMPONENTS DESIGN

4.3.1 BASKET

The PWR BASKET is a cylindrical stainless steel canister composed of a storage sleeve assembly, shell assembly, shield lid and structural lid. The shell and lids provide containment/confinement properties and shielding. A storage sleeve assembly is placed inside the shell that consists of square tubes which include neutron poison sheets to maintain sub-criticality during shipment (10CFR71). The configuration of the storage sleeve assembly can accommodate up to 24 individual fuel assemblies. Special canisters may be placed in the BASKET for storage and transport of failed fuel and fuel debris.

The PWR BASKET shell and lid assembly is designed to the requirements of ASME, Section III, Division II, Subsection NC (1992). The internal storage sleeve assembly is designed to ASME, Section III, Subsection NG (1992).

Containment boundary integrity for each PWR BASKET is verified after loading and sealing of fuel assemblies by hydrostatically testing to 7.3 psig for 10 minutes with zero leakage. The PWR BASKET is vacuumed to a stable internal pressure of $\leq$3 mm Hg for $\geq$ 30 minutes. The internal atmosphere is then backfilled with 99% pure helium and pressurized to 7.3 psig, leak tested, and released back to atmospheric pressure (approximately 14.7 psia).

4.3.2 GTCC BASKET

The GTCC BASKET shell and lid assembly is designed to the requirements of ASME, Section III, Subsection NC (1992). The GTCC BASKET shell has an additional thickness of steel, an extra bottom plate, a steel and lead lid, and an extra steel shielding/support plate to provide additional shielding from high GTCC waste gamma source strength. The GTCC BASKET will store materials listed in Section 4.2.5 that are classified as Greater Than Class C waste. Containment boundary integrity for each GTCC BASKET is verified by the same methods and requirements specified in 4.3.1.

4.3.3 CONCRETE CASK

The CONCRETE CASK is built of concrete with a steel liner placed on the inside surface. It provides structural support, shielding and natural convection cooling for the BASKET. The cask design limits the external surface contact dose rates to less than 100 mrem/hr when measured along the sides, and less than 200 mrem/hr along the top and at the air inlet and outlets. The bottom of the cask has a steel plate which prevents any loss

of material during a postulated cask drop accident.

4.3.4 TRANSFER CASK

The TRANSFER CASK is a cylindrical container fabricated from a laminated steel/lead/neutron shield/steel wall configuration which provides adequate radiation protection properties. The TRANSFER CASK has movable doors at the lower end to allow the transfer of a loaded BASKET from the Spent Fuel Pool cask load pit to the CONCRETE CASK and from the CONCRETE CASK to the SHIPPING CASK for future off-site shipment.

4.3.5 FAILED FUEL CAN

The Failed Fuel Can is designed to ASME, Section III, Subsection NG (1992) and provides a containment boundary for partial or complete fuel assemblies with failed or suspect rods. The Failed Fuel Can also functions to constrain assemblies and associated components within a fixed PWR Basket storage location which maintains the assumptions in the criticality analysis and heat transfer modeling. The dimensions allow the can to fit in one of the four larger peripheral cells of a PWR BASKET. The assembly is made of carbon steel coated with radiation resistant, high temperature, hard surface inorganic zinc coating. The Failed Fuel Can is open to the PWR BASKET atmosphere and thus affected by the drying/backfill operation.

4.3.6 GTCC CAN

The GTCC Can is designed to ASME, Section III, Subsection NF (1992) and effectively contains GTCC waste currently stored at the Trojan Nuclear Plant . The Cans are filled and placed in the GTCC BASKET utilizing a 28 slot alignment grating which is removed after the GTCC BASKET is filled. The Cans are open to the GTCC BASKET atmosphere to allow drying.

4.3.7 FUEL DEBRIS PROCESS CAN CAPSULE

The Fuel Debris Process Can Capsule provides a containment boundary for loose fuel pellets, fuel pellet fragments, and fuel assembly fragments (portions of fuel rods, portions of grid assemblies, etc.). The Process Can Capsule material and welds are selected based

4.3 Storage Components Design

on ASME Section III, Subsection NG (1992). The process can capsule is structurally analyzed for external pressure, internal pressure, dead weight, thermal stresses, and drops. The stresses calculated by classical equations are less than the allowable stresses provided in ASME Section III, Subsection NG (1992) for service levels A and D. The capsule dimensions allow it to fit into a Failed Fuel Can which is placed in one of the four larger peripheral cells of the PWR BASKET. The capsule structural components are made of stainless steel. The fuel debris is dried with high temperature steam in the Fuel Debris Process Cans, which are then placed in the Fuel Debris Process Can Capsule. The Fuel Debris Process Can Capsule is backfilled with 99% pure Helium independently from the PWR BASKET.

4.3.8 Basket Overpack

A Basket Overpack would be used in the unlikely event of a leak in the confinement boundary of a PWR Basket or GTCC Basket that could not be repaired. The Basket Overpack is a cylindrical shell with sufficient inside diameter to accommodate a PWR Basket or GTCC Basket. The Baskets Overpack is designed, fabricated, and tested to provide a confinement barrier for spent nuclear fuel and GTCC waste in accordance with the general design criteria requirements of 10 CFR 72 Subpart F.