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located 1.8 miles West of Timpie, where the loaded shipping casks are transferred from the rail car to a heavy haul tractor/trailer for transport via highway the remaining 26 miles to the PFSF. At the intermodal transfer point are rail sidings, a single-failure-proof gantry crane, and a weather enclosure over the crane.

5.1.4 Operations at the PFSF

5.1.4.1 Receipt and Inspection of Incoming Shipping Cask and Canister

During spent fuel shipment, the canister is contained within the shipping cask, which is mounted horizontally on a rail car or heavy haul trailer. Impact limiters are mounted on either end of the shipping cask and a personnel barrier cover is located over the shipping cask between the impact limiters.

When the shipping cask arrives at the PFSF, the shipping cask, impact limiters, and shipping cradle are visually inspected for damage prior to entry into the Restricted Area (RA). After initial receipt approval the shipment is moved into the security vehicle trap for inspection by security personnel to ensure no unauthorized devices enter the RA. When security clearance is complete, the shipment proceeds into the RA and into the Canister Transfer Building where the personnel barrier is removed and the shipping cask is surveyed for dose rates and contamination levels

5.1.4.2 Transfer of Canister from Shipping Cask to Storage Cask

Transfer of the canister containing spent fuel from the shipping cask to the storage cask takes place within the Canister Transfer Building. After the receipt inspection, the overhead bridge crane is used to remove the impact limiters. The shipping cask lifting yoke is attached to the crane and hooked to the shipping cask, which is uprighted on

the cradle, lifted off the transport vehicle, and moved into one of three canister transfer cells. The shipping cask is secured in place by attaching support struts between the cask and the transfer cell walls. The shipping cask lid is unbolted and removed. The canister is then accessible through the top of the shipping cask where the canister lifting attachments and hoist slings are installed on the canister lid. Temporary shielding is positioned as required to maintain worker doses as-low-as-is-reasonably-achievable (ALARA).

The transfer cask is placed onto the shipping cask by the overhead bridge crane or semi-gantry crane. In order to assure cask stability in the event of an earthquake, the crane is not disconnected from the HI-TRAC transfer cask until seismic support struts are attached to the transfer cask, as discussed in Section 4.7.4.5.1. The HI-TRAC transfer cask can remain connected to the crane throughout the canister transfer operation since this transfer cask has a canister downloader that raises and lowers the canister and the crane is not needed to hoist the canister. In this case, it is not necessary to connect the seismic support struts since continuous connection of the HI-TRAC transfer cask to the crane provides assurance that the transfer cask cannot topple in the event of an earthquake. The seismic support struts are attached between the transfer cask and building columns. Shield doors installed on the bottom of the transfer cask are opened. The hoist slings are pulled up through the transfer cask and the canister is lifted up into the transfer cask just above the shield doors. The shield doors are closed and the canister is lowered onto the doors, which support the weight of the canister. The support struts are disconnect from the transfer cask. The transfer cask is lifted from the shipping cask by the crane and placed on top of the storage cask. Support struts are again attached between the transfer cask and transfer cell walls. The canister is lifted slightly to remove its weight from the transfer cask shield doors.

The shield doors are opened and the canister is lowered into the storage cask. The transfer cask is removed from the top of the storage cask and the storage cask lid is installed. Temporary shielding is removed from the cask transfer area. During the transfer process, radiation levels are measured to assure doses to workers are ALARA.

5.1.4.3 Placement of the Storage Cask on the Storage Pad

The storage cask loading is now complete and ready for transport to a storage pad. The storage cask is moved out of the canister transfer cell by the cask transporter. The cask transporter lifts the storage cask approximately 4 inches high. The cask is then moved to the appropriate storage pad by the cask transporter. At the storage pad, the storage cask is positioned and lowered onto the storage pad. The temperature at the air outlet vents is taken after the cask is placed on the pad in accordance with Technical Specification requirements to confirm proper operation of the storage system.

5.1.4.4 Surveillance of the Storage Casks

While in storage, the proper operation of the storage casks is verified by surveillance procedures. Cask temperatures are measured by a continuous monitoring system to verify temperatures do not exceed temperature limits in the Technical Specifications. In addition, the cask air vents are inspected for blockage on a quarterly basis. An overall site observation surveillance is also performed on a periodic basis to detect any cask damage or accumulation of site debris.

Dose rates associated with individual storage casks are measured to verify that dose rates are within Technical Specification limits to ensure adequate shielding of the canister so that radiation exposure to the general public is minimized and occupational doses to personnel working in the vicinity of the storage casks are maintained as low as is reasonably achievable. Radiation doses emitted from the storage casks are measured by thermoluminescent dosimeters (TLDs) located at the restricted area (RA)

and owner controlled area (OCA) fences to ensure doses are within 10 CFR 20.1301 and 10 CFR 72.104 or 40 CFR 191 limits.

5.1.4.5 Security Operations

Security personnel coordinate several security related functions that include performing continual surveillance for intruders, evaluating intrusion alarms, processing visitors to the PFSF, searching packages and vehicles, issuing badges to workers, coordinating with local law enforcement agencies, and contacting appropriate emergency response personnel. The security personnel are also responsible for identifying and assessing off-normal and emergency events during off-shift hours of PFSF operation. Details for the security personnel are discussed in the PFSF Security Plan (Reference 5).

5.1.4.6 Health Physics Operations

The health physics (HP) personnel are responsible for taking radiation dose and contamination surveys on incoming spent fuel shipments. In order to maintain the PFSF philosophy of "Start Clean/Stay Clean", HP personnel ensure that contamination levels on the canisters of incoming shipments are within the Technical Specification requirements. Canisters exceeding the limits will be returned to the originating power plant for decontamination.

During the transfer process, HP personnel monitor doses to ensure that workers are not exposed to unnecessary radiation. In the event high doses are detected, temporary shielding, in the form of lead blankets, neutron shielding, portable shield walls, etc., are used to maintain doses ALARA. HP personnel perform dose rate surveillances of the loaded storage cask to ensure Technical Specification limits are met.

In addition to surveillance activities, HP personnel monitor onsite and offsite radiation levels to ensure worker and offsite doses are in accordance with regulatory requirements. HP personnel also calibrate radiation protection instrumentation.

5.1.4.7 Maintenance Operations

Because of their passive nature, the storage casks require little maintenance over the lifetime of the PFSF. Typical maintenance tasks may involve occasional replacement and recalibration of temperature monitoring instrumentation.

Periodic maintenance is required on the overhead bridge crane, semi-gantry crane, transfer equipment, and shipping casks. Maintenance of these SSCs, which are classified as important to safety, ensure that they are safe and reliable throughout the life of the PFSF per 10 CFR 72.122(f).

Maintenance is also required on the following components not important to safety: the heavy haul tractor/trailer (if used), rail car and locomotive (if used), cask transporter, security systems, temperature and radiation monitoring systems, diesel generator, electrical systems, fire protection systems, and site infrastructure. The Operations and Maintenance (O&M) Building is provided to facilitate maintenance activities.

5.1.4.8 Transfer of Canisters from PFSF Offsite

A 10 CFR 71 licensed shipping cask will transport in the future the canisters offsite to another facility. Transfer operations will utilize the Canister Transfer Building to transfer the canisters from the storage casks to the shipping casks. Once loaded in a shipping cask, the spent fuel canister is shipped to the designated facility.

5.1.5 Flow Sheets

A flow diagram and illustration showing the sequence of operations for canister receipt, transfer, and placement into storage is shown on Figures 5.1-1 and 5.1-2 for the HI-

STORM storage system.

A flow diagram showing the sequence of operations required to remove the canisters from the PFSF and ship them offsite is shown on Figure 5.1-5.

The number of personnel and the time required for the various operations are given in Table 5.1-1 for the HI-STORM system. This table is used to develop the occupational exposures in Chapter 7.

5.1.6 Identification of Subjects for Safety Analysis

5.1.6.1 Criticality Prevention

As discussed in Section 4.2.1.5.4, criticality is controlled at the PFSF by utilizing fuel assembly geometry. Poison materials are primarily for underwater canister loading in the originating nuclear plant spent fuel pool. During storage, with the canister dry and sealed from the environment, no further criticality control measures within the storage installation are necessary.

5.1.6.2 Chemical Safety

There are no chemical hazards associated with the operation of the PFSF.

5.1.6.3 Operation Shutdown Modes

During storage, there are no operational shutdown modes associated with the HI-STORM Storage System since the system is passive and relies on

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In the matter of PFS
Staff _____ IDENTIFIED ✓
Applicant _____ RECEIVED ✓
Intervenor ✓ REJECTED _____
Other _____ WITHDRAWN _____
DATE 5-16-02 Witness _____
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