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CHAPTER 1

INTRODUCTION AND GENERAL DESCRIPTION OF FACILITY

1.1 INTRODUCTION

Electric utilities operating nuclear power plants in the United States are rapidly reaching their maximum capacity for onsite storage of spent fuel. The Nuclear Waste Policy Act (NWPA) of 1982 mandated that the Department of Energy (DOE) was responsible for the permanent disposal of spent nuclear fuel from the nation's commercial nuclear power plants. The NWPA obligated DOE, beginning not later than January 31, 1998, to dispose of the spent fuel. In a December 17, 1996 letter to all utilities, DOE stated that it would not meet the 1998 deadline. As a result, utilities have had to plan for alternate means of interim storage for their spent fuel beyond 1998.

One such alternate means of spent fuel storage includes dry cask storage. Using this concept, a consortium of utilities have joined in a cooperative agreement through the Private Fuel Storage L.L.C. (PFSLLC) with the Skull Valley Band of Goshute Indians (Band) to undertake the development, licensing, construction, and operation of an Independent Spent Fuel Storage Installation (ISFSI) called the Private Fuel Storage Facility (PFSF). The PFSF will be built on the Skull Valley Indian Reservation and will provide timely, centralized, cost-effective spent fuel storage capacity to meet the needs of the utilities and provide long-term, stable financial income, employment, and training opportunities for Band members and the surrounding community. Preservation of the site and surrounding environment has resulted in the adoption of a "Start Clean / Stay Clean" philosophy that will permit utilization of the land and all buildings constructed in this project for other traditional industrial uses after the facility is decommissioned.

The PFSF will utilize the dry cask storage technology. Dry cask storage safely stores spent nuclear fuel inside of sealed canisters rather than in a spent fuel pool. The storage system technology is compatible with the long-term plans of the DOE interim storage facility and permanent repository. The PFSF is designed to store spent fuel for up to 40 years by which time it is anticipated that all of the spent fuel will be transferred offsite and the facility ready for decommissioning. The initial request for a license is for a term of 20 years. Prior to the end of the initial license term an application for license renewal will be submitted.

The PFSF is located on the Skull Valley Indian Reservation in Tooele County, Utah, approximately 27 miles west-southwest of Tooele City[1] (see Figure 1.1-1). There are no major towns within 10 miles of the PFSF site. The Skull Valley Band of Goshute Indian village is approximately 3.5 miles east-southeast of the site. This village has approximately 30 residents.

The reservation consists of approximately 18,000 acres, of which the PFSF site area is approximately 820 acres. Interstate Highway 80 and the Union Pacific Railroad main line are about 24 miles north of the site. Due to the proximity of the PFSF to the railroad mainline, the shipping cask will either be off-loaded at an intermodal transfer point 1.8 miles West of Timpie, Utah, and loaded onto a heavy haul tractor/trailer for transporting to the PFSF, or transported via a new railroad spur connecting the PFSF directly to the Union Pacific mainline at Low Junction. The PFSF will be accessed by a new road from the Skull Valley Road as shown on Figure 1.1-2.

It is anticipated that the PFSF will be issued a specific license to receive, transfer and possess spent fuel, in accordance with the requirements of 10 CFR 72 (Reference 1), prior to June 2002 in order to commence operation of the PFSF. Construction of the

[1] Tooele City is used to distinguish the City of Tooele from Tooele County.

PFSF is scheduled to start in September 2000 and commercial operation is scheduled for June 1, 2002. As part of the license application, this Safety Analysis Report (SAR) has been prepared in accordance with the guidelines contained in NRC Regulatory Guide 3.48 (Reference 2) and NRC NUREG-1567, draft Standard Review Plan for Spent Fuel Dry Storage Facilities, (Reference 3).

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1.4 SPENT FUEL TRANSPORTATION TO THE PFSF

Although transportation activities are not part of the 10 CFR 72 license application for the PFSF, the transportation process is briefly described herein to provide an understanding of the overall program. Spent fuel enroute to the PFSF will be transported in accordance with applicable U.S. Department of Transportation (DOT) regulations (49 CFR 173-Shippers General Requirements for Shipments and Packaging, Subpart A-"General" and Subpart I - "Radioactive Materials", 49 CFR 171-"General Information, Regulations, and Definitions", 49 CFR 172-"Hazardous Materials Tables and Hazardous Materials Communications Regulations", 49 CFR 174-"Carriage by Rail", 49 CFR 177-"Carriage by Public Highway"), and NRC regulations (10 CFR 71 - "Packaging and Transportation of Radioactive Material"). Holtec is supplying their Holtec International Storage, Transport, and Repository Cask System (HI-STAR 100) (Reference 7) and SNC is supplying their TranStor Shipping Cask System (TranStor) (Reference 8).

As a result of adherence to strict controls, utilities and carriers have a long history of safe spent fuel transportation. In more than 20 years of shipping fuel in the United States, no accident has caused a release of radioactive material. Moreover, no deaths or serious injuries to the public or to transportation industry personnel have ever occurred as the result of the radioactive nature of any radioactive material shipment (Reference 9).

Currently there is no direct rail line to the PFSF. Therefore the PFSF will be designed to employ two transport vehicle modes to ship the cask from the railroad mainline to the site. The preferred mode is to ship the shipping cask the final 32 miles by rail on a new rail spur. The alternate mode is to transfer the shipping cask from the rail car to a heavy haul transport tractor/trailer at an intermodal transfer point located 1.8 miles West of Timpie and haul the shipping cask the final 26 miles by road to the PFSF. The PFSF is expected to receive 100 to 200 shipments of loaded spent fuel canisters annually. The PFSF will accept delivery and perform receipt inspection of the spent fuel shipping casks at the PFSF.

The PFSF shall be designed to utilize two transport modes to haul the shipping cask from the railroad mainline to the site. The preferred mode is to haul the shipping cask by rail on a railroad spur to be constructed from Low Junction to the PFSF. The railroad spur and associated equipment shall be designed in accordance with railroad industry standards. The alternate mode is to haul the shipping cask by highway on a heavy haul tractor/trailer from an intermodal transfer point, located next to the railroad mainline 1.8 miles West of Timpie, to the PFSF via Skull Valley Road. The intermodal transfer point shall include the necessary components (crane, rail siding, and truck access area) to accommodate the rail to tractor/trailer transfer.

At the PFSF the canister shall be transferred from the shipping cask to the storage cask. The shipping cask shall be off-loaded from the transport vehicle inside the Canister Transfer Building using an overhead crane and placed in a shielded transfer cell. Once the shipping cask has been opened a transfer cask shall be placed on top of the shipping cask and the canister hoisted up and secured into the transfer cask. The transfer cask shall then be moved by crane onto the top of a concrete storage cask and the canister shall be lowered into the storage cask. The storage cask lid shall be installed and bolted. The storage cask shall then be moved to the cask storage pad using a cask transporter. Storage of the loaded concrete storage cask shall include temperature monitoring and periodic surveillance of the storage casks.

When the fuel is to be shipped offsite, the storage cask shall be moved back into the Canister Transfer Building using the cask transporter. The transfer cask shall be placed on top of the storage cask and the canister lifted up and secured into the transfer cask. The transfer cask shall then be moved by crane onto the top of a shipping cask. The canister shall be lowered into the shipping cask, which shall be closed and shipped offsite.

The PFSF shall be designed with the necessary equipment (such as, the Canister Transfer Building, cranes, cask transporter, storage area) to accommodate shipping cask receipt, canister transfer from the shipping cask to the concrete storage cask, cask transport to and from the storage pads as detailed above with provisions for security, health physics, maintenance, document control, and inventory management.

3.1.2.2 Onsite Generated Waste Processing, Packaging and Storage

The selected canister-based storage systems shall be designed to confine spent fuel within a sealed canister at the originating nuclear power plant. Therefore, handling of spent fuel is not required and no radioactive waste is generated at the PFSF.

Health physics survey material (i.e. smears, disposable clothing) shall be collected, identified, packaged in low level waste (LLW) containers, marked in accordance with 10 CFR 20 requirements, and temporarily stored in the LLW holding cell of the Canister Transfer Building while awaiting shipment to an offsite low-level radioactive disposal facility.

There shall be no other systems or facilities for processing, packaging, storing, or transporting any other type of radioactive waste at the PFSF.

3.1.2.3 Utilities

The PFSF shall be designed to include utilities necessary for facility operation. These utilities include (1) electrical power for operation of equipment, lights, monitoring equipment, communication systems, security systems; (2) backup electrical power for operation of security systems, emergency lights, monitoring equipment, and communication systems; and (3) mechanical systems for operation of fire protection equipment, building HVAC systems, compressed air systems, water supply systems, tractor/trailer unit shall also be limited by the size of the fuel tank to minimize a potential fire duration in the Canister Transfer Building load/unload bay. The railroad locomotive fuel tank shall also be limited in size or the railroad locomotive shall not be allowed in the Canister Transfer Building to prevent the possibility of a fire in the building from the large quantity of fuel in the locomotive. The design for the SSCs shall encompass any temperature gradients resulting from a fire from these scenarios.

Determination of overpressure conditions due to explosions at the PFSF shall be in accordance with Regulatory Guide 1.91 (Reference 22). Per Regulatory Guide 1.91, a 1 psi overpressure would be produced by a detonation of the following quantities of explosives at the approximate distances shown:

Mode of Transport	Amount of Hazardous Cargo	At a Distance of
Highway Truck	50,000 lb	1660 ft
Railroad Car	132,000 lb	2290 ft
River Vessel	10,000,000 lb	10,000 ft

Since the distances from the PFSF to the nearest highway, railroad, and river exceeds the distances shown above for a 1 psi overpressure, the SSCs are not required to be designed for explosives.

3.3.7 Materials Handling and Storage

This section of the principal design criteria establishes requirements that satisfy 10 CFR 72.128(a) and (b), which identify general design criteria that requires spent fuel storage and handling equipment be designed to ensure adequate safety under normal and accident conditions and that radioactive waste treatment facilities be provided.

This section also establishes requirements that satisfy 10 CFR 72.122(l), which identifies general design criteria that requires the storage system be designed to allow ready retrieval of the spent fuel for shipping offsite.

3.3.7.1 Spent Fuel Handling and Storage

All spent fuel handling and storage at the PFSF shall be performed with the spent fuel contained in the sealed metal canister. The design for handling and storage components shall ensure that the spent fuel canister confinement integrity is maintained.

The design shall ensure that handling components can safely be used to retrieve canisters from the storage casks and load them into shipping casks for shipment offsite throughout the life of the PFSF.

3.3.7.2 Radioactive Waste Treatment

Since the spent fuel is contained in the sealed metal canister, there is expected to be negligible radioactive contamination at the PFSF. The PFSF shall include provisions to package and store health physics survey material and dry wipes used to remove contamination in the event some minor radioactive contamination is found.

3.3.7.3 Waste Storage Facilities

A low level waste (LLW) holding cell shall be provided to store health physics survey material and dry wipes used to check casks for radioactive

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4.5 SHIPPING CASKS AND ASSOCIATED COMPONENTS

Spent fuel shipping casks are used to transport the spent fuel canisters from the originating power plants to the PFSF and later offsite. The shipping casks are designed to protect the canisters from the effects of environmental conditions, natural phenomena, and accidents in accordance with 10 CFR 71. Shipping casks are not licensed under 10 CFR 72. However, since the shipping casks are used to transport spent fuel to and from the PFSF and are part of the canister transfer process in the Canister Transfer Building, this section provides a brief summary of the shipping casks and associated components.

The shipping casks are shipped to the PFSF and shipped offsite at a later date complete with impact limiters, a shipping cradle, and tie downs. The shipping casks are shipped from the railroad mainline to the PFSF either by rail on a railroad spur or by highway. Shipment by highway requires the shipping casks be transferred from the rail car to a heavy haul tractor/trailer at an intermodal transfer point. During the rail to trailer transfer, the cask and shipping components remain an integral unit under 10 CFR 71 packaging requirements. At the PFSF, the shipping cask is unloaded from the rail car or heavy haul tractor/trailer and moved to a canister transfer cell where the shipping cask is opened and the canister is removed. After the canister is unloaded, the shipping cask is resealed and sent back to the power plants for reloading of another sealed canister of spent fuel.

The shipping components addressed in this section are:

- HI-STAR shipping cask system
- TranStor shipping cask system
- Shipping cask repair and maintenance area
- Skull Valley Road / Intermodal transfer point
- Low Corridor rail spur

The shipping casks and associated components are described below. Figures are provided to illustrate the systems and their function.

4.5.1 HI-STAR Shipping Cask System

The HI-STAR system is one of the shipping systems used to ship spent fuel from the originating power plants to the PFSF. The HI-STAR (Holtec International Storage, Transport, and Repository) is a spent fuel packaging design in compliance with DOE's design procurement specifications for multi-purpose canisters and large transportation casks. The HI-STAR system consists of the same sealed metal canister as used in the HI-STORM storage system, which is confined within a metal overpack or cask with impact limiters. Holtec submitted a SAR to the NRC in accordance with 10 CFR 71 for the HI-STAR system (Reference 3). The HI-STAR system components are shown on Figure 4.5-1. Details of the system and design parameters are addressed in the HI-STAR shipping SAR.

4.5.2 TranStor Shipping Cask System

The TranStor system is one of the shipping systems used to ship spent fuel from the originating power plants to the PFSF. The TranStor system is a multi-purpose canister system used for the safe storage and offsite shipping of spent nuclear fuel. The TranStor system includes a sealed metal canister, a shipping cask with impact limiters, a concrete storage cask, and a transfer cask. The canister is used in combination with the storage cask and the shipping cask components. Offsite shipping of spent fuel is performed using only the canister and the shipping cask components. SNC submitted a SAR to the NRC in accordance with 10 CFR 71 for the TranStor system (Reference 13). The TranStor system components are shown on Figure 4.5-2. Details of the system and design parameters are addressed in the TranStor shipping SAR.

4.5.3 Shipping Cask Repair and Maintenance

If shipping cask repair or maintenance activities are necessary, they will be conducted at the Operation and Maintenance Building or at a vendor designated location. No special contamination control measures are anticipated for repair or maintenance activities since the spent fuel is contained within a sealed canister and the shipping casks used for the PFSF do not enter any nuclear plant spent fuel pools and therefore, remain free of radioactive contamination.

Health physics surveys will be taken on all incoming canisters as normal receiving operations at the PFSF. In the event contamination above acceptance levels is discovered, the canister will be shipped back to the originating nuclear power plant for canister decontamination and/or spent fuel repackaging.

4.5.4 Skull Valley Road / Intermodal Transfer Point

4.5.4.1 Intermodal Transfer Point

Shipments that utilize the Skull Valley Road / intermodal transfer point are moved by the use of roads from the rail mainline to the PFSF using heavy-haul tractor/trailers. The intermodal transfer point is located 1.8 miles West of Timpie, approximately 24 miles north of the PFSF. The intermodal transfer point equipment is designed to accommodate transfer of the shipping casks from the rail car to the heavy haul tractor/trailer unit for highway shipping. The intermodal transfer point consists of rail sidings off the Union Pacific Railroad mainline, a 150 ton gantry crane, and a tractor/trailer yard area. The gantry crane is a single-failure-proof crane to preclude the accidental drop of a shipping cask even though the cask is designed to withstand such drops in accordance with 10 CFR 71. The crane is housed in a weather enclosure, which provides a clean, dry environment for transfer of the shipping cask.

The intermodal transfer point is shown on Figure 4.5-3.

4.5.4.2 Shipping Cask Heavy Haul Tractor/Trailer

Heavy haul transport tractor/trailers are used to transport the shipping cask from the intermodal transfer point to the PFSF by highway. The maximum weight of a loaded shipping cask with impact limiters and shipping cradle is approximately 142 tons, which requires the use of overweight trailers. The heavy haul tractor/trailers are designed to accommodate road conditions at the intermodal transfer point, frontage road, Skull Valley Road, and PFSF. The unit is designed to travel at low speeds and is 12 ft wide with multiple wheel sets to provide stable transport of the shipping cask.

The unit is classified as not Important to Safety since safety of the spent fuel canister is maintained by the shipping cask. A typical heavy haul transport tractor/trailer unit is shown on Figure 4.5-4.

4.5.5 Low Corridor Rail Spur

4.5.5.1 Rail Spur

Shipments that utilize the railroad spur continue on from the rail mainline to the PFSF by rail car. A rail spur will be built from the Union Pacific mainline located at Low Junction to the PFSF. The rail spur is designed to standard railroad load, grade, and clearance requirements per the Union Pacific Railroad and industry standards to facilitate use of Union Pacific and standard railroad equipment.

The Low Corridor rail spur is shown on Figure 4.5-6

4.5.5.2 Shipping Cask Rail Car

Heavy duty 145-ton (minimum) flatbed rail cars (two 3-axle trucks) or depressed center flatbed rail cars (two sets of 2-axle trucks) are used to transport shipping casks to the PFSF. The maximum weight of the shipping cask with impact limiters and shipping cradle on the rail car is approximately 142 tons as discussed in Section 4.5.4.2, which is within the allowable load for a 145 ton flatbed rail car. The Canister Transfer Building cask load/unload bays are designed with railroad tracks to facilitate rail car shipments where the shipping casks would be unloaded or loaded.

The flat bed rail cars are classified as not Important to Safety since spent fuel safety functions are maintained by the shipping cask. A typical 145 ton flat bed rail car is shown on Figure 4.5-5.

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4.7.2 Canister Transfer Cranes

The Canister Transfer Building houses two cranes, a 200 ton overhead bridge crane and a 150 ton semi-gantry crane. The cranes are provided for the purpose of loading and unloading shipping casks off or on the heavy haul tractor/trailers and transferring spent fuel canisters between the shipping cask and the storage casks. The 200 ton crane can be used for both load/unload and transfer operations. The semi-gantry crane can only be used for transfer operations and provides additional crane availability because of the time requirements involved in the transfer operations.

The design of the canister transfer cranes will be performed during the detailed design phase of the project. Detailed design of the cranes will be performed by the crane vendor.

4.7.2.1 Design Specifications

The canister transfer cranes will meet the requirements of the Design Criteria contained in Chapter 3, which requires the cranes be designed in accordance with ASME NOG-1 (Reference 32) and be single-failure-proof in accordance with NUREG-0554 (Reference 33).

During the detailed design stage, design requirements will be specified that provide for the performance of testing, inspection, and maintenance activities on the cranes in accordance with 10 CFR 72.122(f). Inspection and acceptance of the cranes will be performed during fabrication, in accordance with the QA Program described in Chapter 11, to ensure that the design requirements are satisfied.

The functional parameters of the overhead bridge crane are as follows:

Capacity:	Main hoist - 200 tons (Maximum Critical Load)
	Auxiliary hoist - 25 tons
Hoist type:	Main hoist - Single-failure-proof
	Auxiliary hoist - Single-failure-proof
Hoist ropes:	Main hoist - Carbon steel
	Auxiliary hoist - Carbon steel
Bridge span:	65'-0"
Length of runway:	260'-0"
Top of rail elev:	70'-6" above floor slab
Bridge/trolley:	40/25 fpm (Maximum speed)
Motion controls:	DC hoist and traverse
Operator controls:	Radio remote and pendant

The functional parameters of the semi-gantry crane are as follows:

Capacity:	Main hoist - 150 tons (Maximum Critical Load)
	Auxiliary hoist - 25 tons
Hoist type:	Main hoist - Single-failure-proof
	Auxiliary hoist - Single-failure-proof
Hoist ropes:	Main hoist - Carbon steel
	Auxiliary hoist - Carbon steel
Bridge span:	35'-0"
Length of runway:	180'-0"
Top of rail elev:	55'-9" above floor slab
Bridge/trolley:	50/30 fpm (Maximum speed)
Motion controls:	DC hoist and traverse
Operator controls:	Radio remote and pendant

4.7.2.2 Plans and Sections

The canister transfer cranes are shown in the Canister Transfer Building arrangements in Figures 4.7-1.

4.7.2.3 Function

The function of the canister transfer cranes is to assist in the canister transfer operations at the PFSF. A description of the canister transfer operations is contained in Chapter 5.

The overhead bridge crane will perform the following activities:

- Remove the impact limiters and personnel barrier from the shipping cask and move them to a laydown area, and
- Upright and remove the shipping cask from the heavy haul trailer and move the cask into a canister transfer cell.

The overhead bridge crane or the semi-gantry crane will perform the following activities:

- Remove the lid from the shipping cask,
- Lift the transfer cask and place on top of the shipping cask, then lift the canister into the transfer cask,
- Lift the transfer cask containing the canister off the shipping cask and onto the top of the storage cask,
- Lower the canister into the storage cask, and
- Remove the transfer cask from on top of the storage cask and place the lid on top of the storage cask.

4.7.2.4 Components

The major components of the overhead bridge crane are the bridge, trolley, main hoist, and auxiliary hoist. The major components of the semi-gantry crane are the gantry frame, trolley, main hoist, and auxiliary hoist.

4.7.2.5 Design Bases and Safety Assurance

The canister transfer cranes are classified as being Important to Safety to provide the safety assurance commensurate with shipping cask and canister lifting activities. The design bases for the canister transfer cranes are described in Chapter 3. Each crane has sufficient capacity to lift the maximum lifted load the crane is designed for during transfer operations. Based on maximum weights presented by Holtec (HI-STORM SAR Tables 3.2.1 and 3.2.2, HI-STAR shipping SAR Table 7.1.1) and by SNC (TranStor SAR Table 3.2-1 and TranStor shipping SAR Table 2.2-1), the maximum lifted loads are addressed in the following Sections:

The crane operations are designed not to exceed the handling loads (live loads) assumed in the HI-STORM and TranStor SARs. The analysis assumes the off-normal handling load is generated from a 2 fps horizontal impact. The crane design parameters limit the high speed of the trolley to less than 60 fpm (1 fps).

4.7.2.5.1 Maximum Loads Applicable to the Overhead Bridge Crane

The weight of loaded shipping cask, impact limiters, cask support cradle, and personnel barrier is approximately 142 tons (HI-STAR system) and 138 tons (TranStor system).

The weight of loaded shipping cask and shipping cask lifting yoke is approximately 121 tons (HI-STAR system) and 118 tons (TranStor system).

The canister is then backfilled with inert helium gas and the drain and fill ports are welded closed, thereby sealing the canister. The outer surfaces of the transfer cask are then checked for surface contamination and decontaminated, if necessary.

The sealed canister is transferred from the transfer cask to a shipping cask, and the shipping cask closure bolted in place. The shipping cask is then loaded onto the shipment vehicle, fitted with impact limiters to protect the shipping cask during transportation, and shipped to the PFSF.

5.1.2 Operations Between the Originating Nuclear Power Plant and the PFSF

The shipping cask, containing the sealed spent fuel canister, is shipped by rail to the PFSF. During transportation, the shipping cask provides a complete confinement barrier for the canister that is capable of withstanding any accident that could occur. The shipping cask is fitted with impact limiting devices for additional protection during transit. The offsite transportation system is licensed in accordance with the requirements of 10 CFR 71, "Packaging and Transportation of Radioactive Material", and complies with the requirements of 49 CFR 171, "General Information, Regulations, and Definitions", 49 CFR 172, "Hazardous Materials Tables and Hazardous Materials Communications Regulations", 49 CFR 173, "Shippers - General Requirements for Shipments and Packages", 49 CFR 174, "Carriage by Rail", and 49 CFR 177, "Carriage by Public Highway".

5.1.3 Operations Between the Railroad Mainline and the PFSF

The PFSF is located approximately 24 miles south of the rail mainline and currently does not have rail access. The shipping casks are shipped to the PFSF by rail to either a new rail spur located at Low Junction, where the shipping casks remain on the rail car and are transported 32 miles directly to the PFSF, or to an intermodal transfer point 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

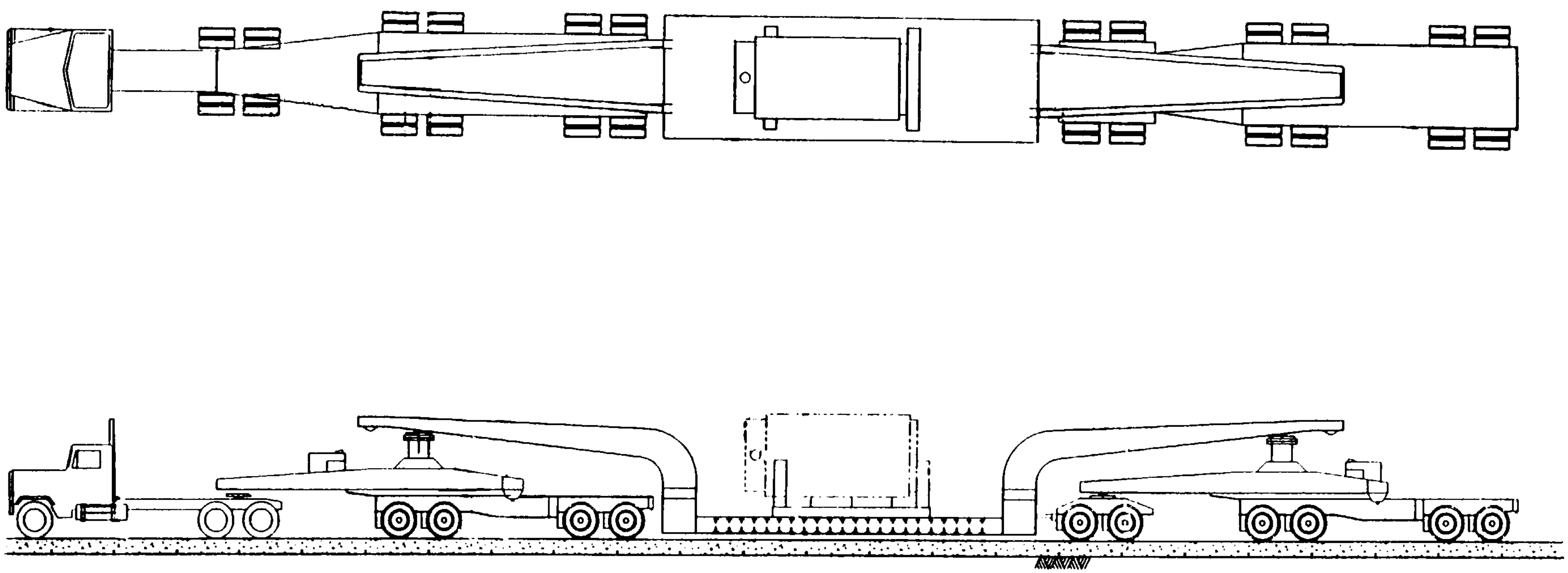

Figure 4.5-4

SHIPPING CASK HEAVY HAUL TRACTOR/TRAILER

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

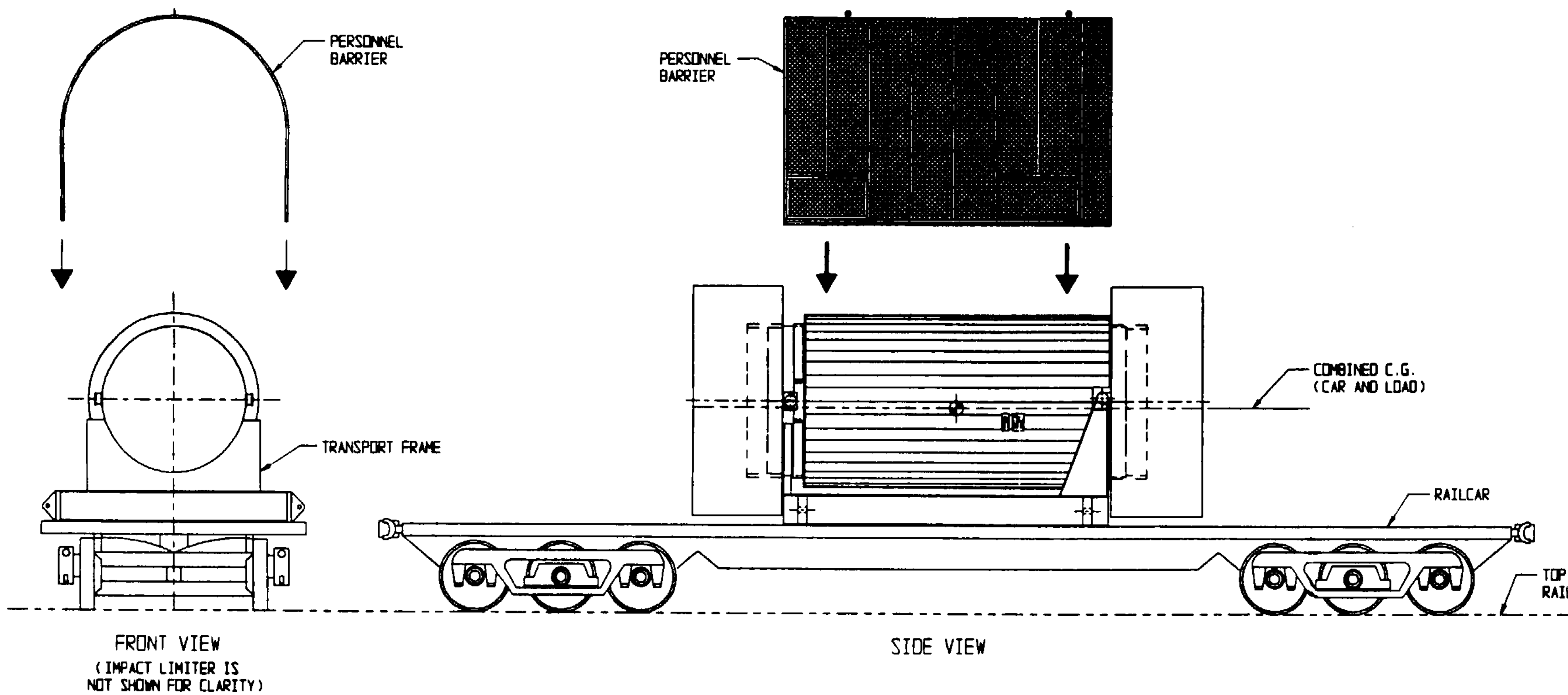

Figure 4.5-5

145 TON FLAT BED RAIL CAR

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

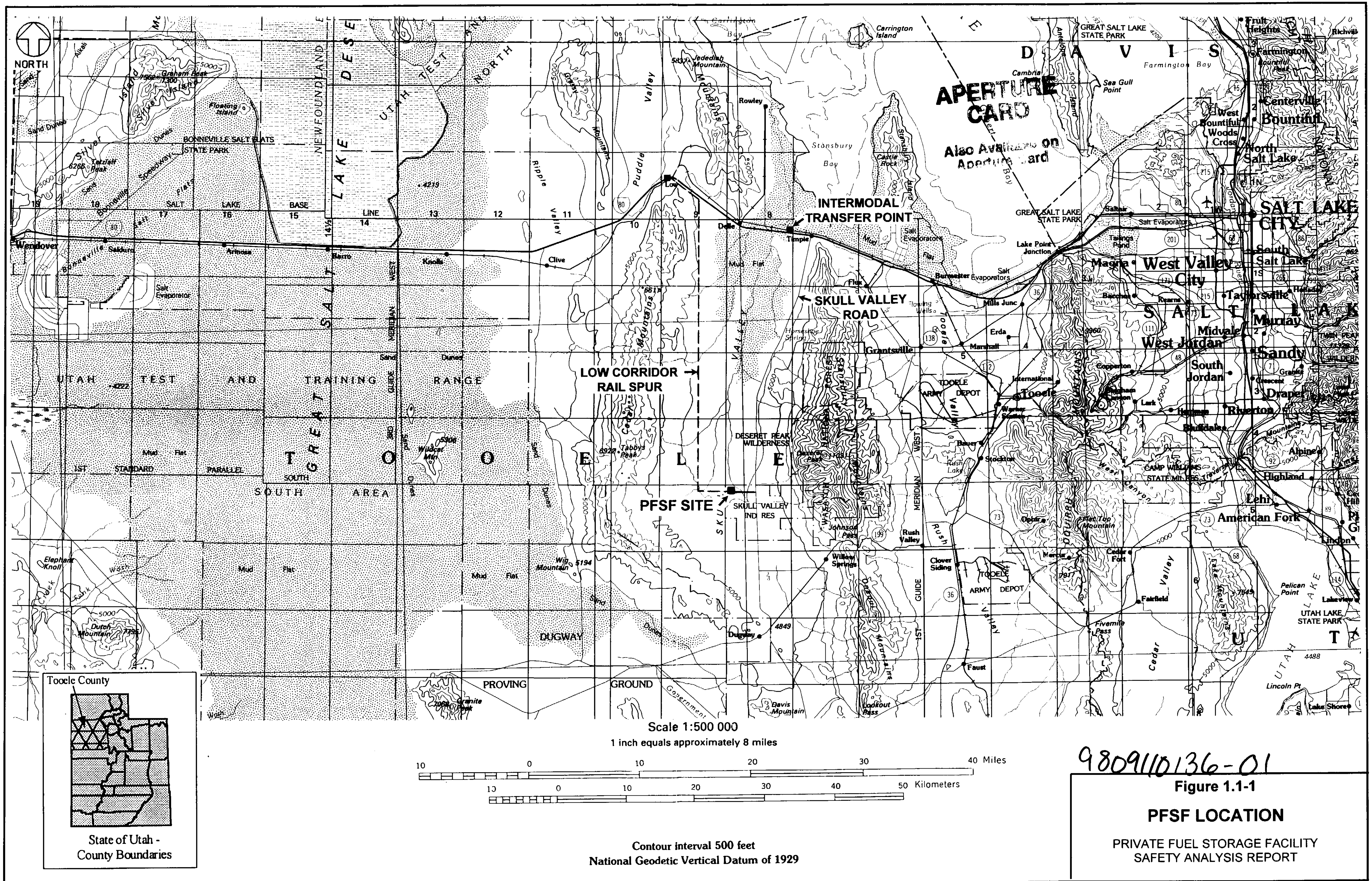

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Figure 1.1-1

PFSF LOCATION

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 1.1-2

PFSF SITE PLAN

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 1.2-1

PFSF GENERAL ARRANGEMENT

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 2.1-2

SITE & ACCESS ROAD
LOCATION PLAN - SHEET 1 OF 2

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 2.6-2
PLOT PLAN AND LOCATIONS
OF GEOTECHNICAL INVESTIGATIONS
SHEET 1 OF 2

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE
UNCLASSIFIED INFORMATION

Figure 4.1-1

CANISTER TRANSFER BUILDING

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 4.5-3 (Sheet 1 of 2)

INTERMODAL TRANSFER POINT

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 4.5-3 (Sheet 2 of 2)

INTERMODAL TRANSFER POINT

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

Revision 2

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 4.5-6 (Sheet 1 of 4)

LOW CORRIDOR RAIL SPUR

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 4.5-6 (Sheet 2 of 4)

LOW CORRIDOR RAIL SPUR

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 4.5-6 (Sheet 3 of 4)

LOW CORRIDOR RAIL SPUR

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 4.5-6 (Sheet 4 of 4)

LOW CORRIDOR RAIL SPUR

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE
UNCLASSIFIED INFORMATION

Figure 4.7-1 (Sheet 1 of 3)
CANISTER TRANSFER BUILDING
PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE UNCLASSIFIED INFORMATION

Figure 4.7-1 (Sheet 2 of 3)

CANISTER TRANSFER BUILDING

PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT

FIGURE WITHHELD AS SENSITIVE
UNCLASSIFIED INFORMATION

Figure 4.7-1 (Sheet 3 of 3)
CANISTER TRANSFER BUILDING
PRIVATE FUEL STORAGE FACILITY
SAFETY ANALYSIS REPORT