WCS-CISF-16-005

Enclosure 3

Changed WCS CISF SAR Pages, Interim Revision 1

1.2.2 Principal Design Criteria

The WCS CISF principal design criteria are based on the site characteristics, the design criteria associated with the cask systems listed in Table 1-1 that have been previously certified by the NRC, and specific criteria required for the WCS CISF design.

The cask systems listed in Table 1-1 meet the WCS CISF design criteria. Table 1-2 provides a summary of the WCS CISF principal design criteria.

1.2.3 Facility Descriptions

The major facilities at the WCS CISF are the Cask Handling Building and the storage area. The Cask Handling Building is approximately *140* feet long by *130 feet wide by 70 feet high. The building is a two-bay steel structure designed to support two commercial overhead cranes used to move transportation casks from the rail car to the transport vehicle. One bay of the building will house the Canister Transfer System described in Section 1.3.1.2 and the other bay will be available for direct transfer of transportation casks from the rail car to the transport vehicle. A 2,400 square foot area of the building is set aside for cask storage. The building plan view is shown in Figure 1-7 is a section through the building showing the overhead crane location. Figure 1-8 is a section through the building showing the overhead crane location. Air monitors and dosimeters are located in the building for monitoring purposes. The building is not designed or intended to provide confinement or shielding for SNF or GTCC materials. The building is classified as ITS - Category C.* The purpose of the Cask Handling Building is to receive and prepare for storage shipments of dual-purpose canister systems. It will also receive GTCC waste canisters for storage at the site. It is also designed to process canisters stored at the site for off-site shipment. The Cask Handling Building is designed to handle canisterized fuel only and does not have the capability to handle bare fuel.

As Low As Reasonably Achievable (ALARA) principles are incorporated, to the maximum extent practical, throughout the facility design to reduce radiation exposure to facility personnel. Cranes/lifting devices for transferring the NUHOMS® transportation/transfer casks from the transportation skid to the transfer trailer/skid are designed to minimize the need for facility personnel to be near the loaded cask. This equipment is NITS as the lift heights of the loaded casks are maintained below 80 inches at all times after removal of the impact limiters. The analysis of bounding drop scenarios shows that a NUHOMS® transportation/transfer cask will maintain structural integrity of the DSC confinement boundary and maintain basket geometry from an 80 inch (from the bottom of the cask to the “ground”) drop. The ITS canister transfer system for the vertical transfer of canisters is remotely operated and the transfer equipment used to make the transfer to the storage overpacks is substantially identical to that used to transfer the canister into dry storage at the reactor facilities where the fuel was initially stored.

All indicated changes are in response to RSI NP-4.7

Table 1-2
Summary of WCS CISF Principal Design Criteria
(3 pages)

Design Parameter	Design Criteria	Condition	Applicable Codes, Standards and Basis
Extreme Temperature (NAC Systems)	*Maximum Temperature 113°F* *Minimum Temperature -1°F*	*Accident*	*Section 2.3.3.1*
Snow and Ice	Snow Load 10 psf	Normal	Section 2.3.2.4
Dead Weight	Per design basis for systems listed in Table 1-1	Normal	N/A
Internal and External Pressure Loads	Per design basis for systems listed in Table 1-1	Normal	N/A
Design Basis Thermal Loads	Per design basis for systems listed in Table 1-1	Normal	N/A
Operating Loads	Per design basis for systems listed in Table 1-1	Normal	N/A
Live Loads	Per design basis for systems listed in Table 1-1	Normal	N/A
Radiological Protection	Public wholebody ≤ 5 Rem Public deep dose plus individual organ or tissue ≤ 50 Rem Public shallow dose to skin or extremities ≤ 50 Rem Public lens of eye ≤ 15 Rem	Accident	10 CFR 72.106
Radiological Protection	Public wholebody ≤ 25 mrem/yr (1) Public thyroid ≤ 75 mrem/yr(1) Public critical organ ≤ 25 mrem/yr(1)	Normal	10 CFR 72.104
Confinement	Per design basis for systems listed in Table 1-1	N/A	N/A
Nuclear Criticality	Per design basis for systems listed in Table 1-1	N/A	N/A
Decommissioning	Minimize potential contamination	Normal	10 CFR 72.130
Materials Handling and Retrieval Capability	Cask/canister handling system prevent breach of confinement boundary under all conditions Storage system allows ready retrieval of canister for shipment off-site	Normal	10 CFR 72.122(1)
Cask Handling Building	*Prevent building collapse in accordance with 2006 International Building Code*	*Accident*	*10 CFR 72.122(b)(2)(ii)*

Note:

1. In accordance with 10 CFR 72.104 *(a)*(3) limits include any other radiation from uranium fuel cycle operations within the region.

All indicated changes are in response to RSI NP-4.7

Security-Related Information Figure Withheld Under 10 CFR 2.390.

Figure 1-7
Cask Handling Building Plan

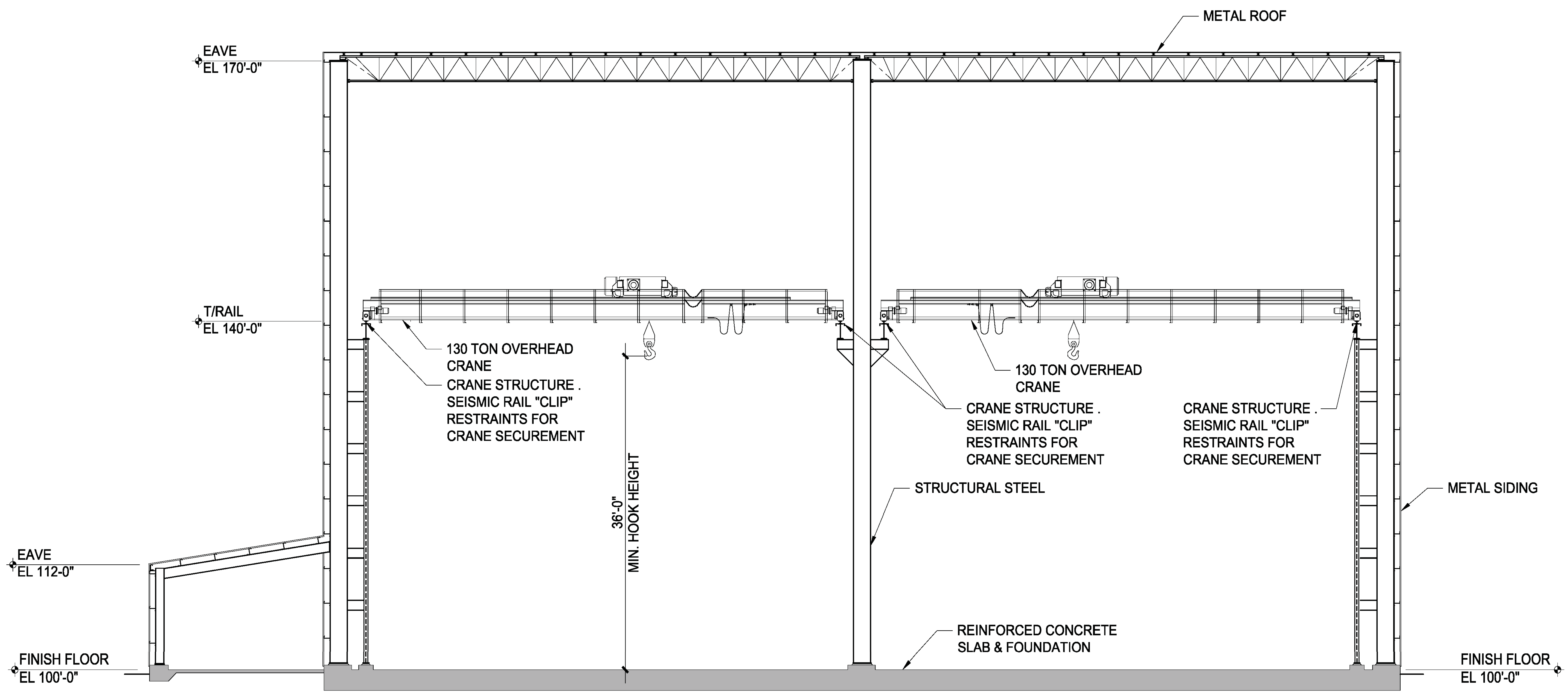

Figure 1-8
Cask Handling Building Section View

All indicated changes are in response to RSI NP-4.7

3.2 Classification of WCS Interim Storage Facility Structures, Systems and Components

Components are classified in accordance with the criteria of 10 CFR Part 72. Structures, systems, and components classified as important-to-safety (ITS) are defined in 10 CFR 72.3 as the features of the WCS CISF whose function is:

- To maintain the conditions required to store spent fuel and GTCC waste safely.
- To prevent damage to the canister during handling and storage.
- To provide reasonable assurance that spent fuel can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public.

These criteria are applied to the WCS CISF components in determining their classification in the paragraphs that follow.

3.2.1 Cask Handling Building and Equipment

The purpose of the Cask Handling Building and associated lifting equipment is to receive, inspect and prepare for storage, shipments of canisterized spent nuclear fuel and GTCC waste canisters and to provide for cask and rail car light maintenance. The Vertical Cask Transporter (VCT) used for upending the transportation cask and placing it under the Canister Transfer System is ITS. The Canister Transfer System and associated lifting hardware used for stack up and transfer operations for the NAC canisters is ITS because the canisters are lifted above the specified Technical Specifications [3-1] limits. The 130-ton overhead crane and associated NUHOMS® MP197HB and MP187 Casks Lift Beam Assembly are not-important-to-safety (NITS) because the NUHOMS® cask and canister are not lifted above the Technical Specifications [3-1] height limits. *The building structure (structural steel and column foundations) will be classified as ITS to prevent massive building collapse onto cask systems and related ITS SSCs. The overhead crane bridge trucks and trolley seismic clips are ITS.* The balance of the facility is also NITS as the fuel remains sealed from the environment inside the confinement boundary provided by the canister for all operations and the overpacks provide protection from natural phenomena and postulated off-normal and accident events.

3.2.2 Storage Systems and Pads

The classification of the components that make up the cask systems authorized for storage at the WCS CISF, including canister, transfer casks, storage overpacks, transfer equipment and storage pads are provided in Appendices A.3, B.3, C.3, D.3, E.3, F.3 and G.3, depending on the canister/cask system. Section 2.1 of the Technical Specifications [3-1] lists the canisters authorized for storage at the WCS CISF. Table 3-1 provides the cross reference to the applicable appendix and section for each canister/storage overpack where the classifications of the components of that system are identified.

All indicated changes are in response to RSI NP-4.7

During operations, the amount of flammable liquids that are allowed in the Cask Handling Building is controlled. The only sources of flammable liquids in the Cask Handling Building are the locomotive used to move the railcars into and out of the Cask Handling Building, the Cask Transfer System, the Vertical Cask Transporter (VCT) and the transfer vehicle. The locomotive will not be allowed in the building during cask handling operation other than when the transportation casks are ready for transport. The Canister Transfer System and the Vertical Cask Transporter are quantity limited (< 50 gallons) and are described in SAR Section 12.2.1. The transfer vehicle for the NUHOMS® System is also quantity limited (<60 gallons) and will not be in the Cask Handling Building during handling of the vertical systems. As the NUHOMS® System is evaluated for fire with 300 gallons of diesel fuel, the quantity of fuel in the transfer vehicle is bounded for NUHOMS® Systems operations.

Due to the positive drainage of the WCS CISF approach slabs, a spill large enough to cause puddling would also tend to drain toward the storm drainage system and thus away from the storage overpacks. This drainage, coupled with the expected rapid detection of any fire by the fuel transfer personnel, will tend to limit the spread and severity of any fire. In addition, off-site firefighting assistance is available if required. The damage caused by any fire will be negligible given the massive nature of the casks. A spill too small to cause puddling would be very difficult to ignite due to the relatively high flash point of diesel fuel and such a small fire would not pose a credible threat to the WCS CISF.

There is a fire *suppression* system in the Cask Handling Building that will be installed to *mitigate the consequences of a fire*.

WCS CISF initiated explosions are not considered credible since no explosive materials are present. The effects of externally initiated explosions are bounded by the design basis tornado generated missile load analysis performed for the authorized storage systems.

3.3.2 Thermal

Thermal design criteria are derived from the WCS CISF site characteristics and include ambient temperature and insolation (solar load). These are used in the determination of thermal conditions to be addressed in the system and component analyses. Specific load values based on these criteria are developed in Chapter 8.

3.3.2.1 Ambient Temperature

Ambient normal, off normal and extreme temperatures are given in Table 1-2. These are documented in Section *2.3.3.1*.

3.3.2.2 Solar Load (Insolation)

The Solar Loads are given Table 1-2 and are taken from 10 CFR Part 71 [3-4].

All indicated changes are in response to RSI NP-4.7

7.5 Cask Handling Building

The Cask Handling Building (CHB) is a two-bay ITS - Category C steel structure. The CHB is 140 feet by 130 feet and approximately 70 feet tall with rail access to facilitate cask unloading operations, canister transfer operations, and miscellaneous maintenance activities. Figures 1-7 and 1-8 show the general building layout and building cross section. CHB Structural Design is discussed in Section 7.5.3.

To facilitate rail car unloading activities for NUHOMS® systems, the CHB design incorporates two overhead bridge cranes rated at 130 tons each for lifting loaded spent fuel transportation casks from the rail car, removal of impact limiters, and shielding, etc.

All transfer operations to move the NUHOMS® System MP187 and MP197HB transportation casks are accomplished with the transportation casks in a horizontal orientation utilizing a NITS bridge crane as all lifts are limited to a maximum height of 80 inches. The vertical systems will utilize the overhead bridge cranes to remove impact limiters and personnel barriers, and the Vertical Cask Transporter (VCT) is used to move the NAC transportation casks from the rail car to the Cask Transfer System (CTS).

The CHB also houses operations involving both a CTS and a VCT in support of unloading transportation casks and transferring canistered fuel from the NAC transportation casks into the storage casks. Both systems are considered ITS, although the VCT transport of a storage cask to the pad has been evaluated for limited lift height drops.

For WCS, the CTS and VCT are independently designed and analyzed to meet the intent of NUREG-0612 [7-3], "Control of Heavy Loads at Nuclear Power Plants,"

> *"To provide adequate measures to minimize the occurrence of the principal causes of load handling accidents and to provide an adequate level of defense-in-depth for handling heavy loads near spent fuel and safe shutdown systems".*

Understanding the WCS facility will not have safe shutdown equipment or spent fuel pools, it is recognized that the canisters loaded with fuel must be safely and securely handled thereby protecting the fuel from damage and protecting the site and surrounding areas from any potential radiological impacts. Even though the potential for a radiological release is very low, the WCS CISF objective is to prevent the occurrence of load handling accidents. Therefore, the licensing basis is to provide handling systems that are robust to failure which makes the likelihood of a load drop event extremely small.

All indicated changes are in response to RSI NP-4.7

7.5.3 Cask Handling Building Structural Design

This section presents the structural description and design criteria for the WCS CISF Cask Handling Building (CHB). The CHB is designed to meet the requirements of 10 CFR 72.122(b)(2)(ii). The CHB is a two bay commercially designed and fabricated steel frame structure with metal siding designed to support two commercial overhead cranes used to move transportation casks from the rail car to the transfer vehicle. The CHB is ITS - Category C. The overhead cranes will also be used to remove or install personnel barriers, impact limiters from the transportation casks. All operations to move the NUHOMS® System MP187 and MP197HB transportation casks are accomplished with the transportation casks in a horizontal orientation. The overhead cranes are NITS as all lifts are limited to a maximum height of 80 inches.

7.5.3.1 Descriptions of Systems, Structures and Components

To facilitate rail car unloading activities for NUHOMS® systems, the CHB design incorporates two overhead bridge cranes rated at 130 tons each for lifting loaded spent fuel transportation casks from the rail car, removal of impact limiters, and shielding, etc. The vertical systems will utilize the overhead bridge cranes to remove impact limiters and personnel barriers, and the VCT is used to move the NAC transportation casks from the rail car to the CTS.

The overhead bridge cranes are classified as Not-Important-to-Safety and are designed in accordance with ANSI B30.2, "Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)." The overhead bridge cranes rails are attached to the CHB structure in a manner that provides adequate assurance that the rails will remain attached to the CHB structure during the above-described seismic event. Seismic clips are provided on the overhead crane bridge trucks and trolley to limit uplift during a seismic event, thereby eliminating the potential for the bridge or trolley to fall onto loaded spent fuel casks inside the CHB.

Lifts performed by the overhead bridge crane are governed by the guidance of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants: Resolution of Generic Technical Activity A-36," to minimize the potential for release of radioactive material from a spent fuel cask. NUHOMS® transportation/transfer cask lifts are performed using the overhead bridge crane and the lift height is administratively controlled to ensure that the 80-inch design basis drop accidents previously approved by the NRC remain bounding (Reference WCS CISF SAR Tables A.3-1, B.3-1, C.3-1, and D.3-1). The overhead cranes may be used for miscellaneous lifts that do not involve lifting of loads over loaded spent fuel transportation or storage casks inside the CHB.

All indicated changes are in response to RSI NP-4.7

7.5.3.2 *Design Analysis*

The CHB structure is designed to withstand snow, rain, and wind loads in accordance with the 2006 International Building Code. Administrative controls will be used to preclude the presence of loaded storage, transportation, or transfer casks inside the CHB during a tornado watch or other inclement weather watches with the potential to lead to winds in excess of those addressed by International Building Code (IBC), thereby eliminating the potential for structural members or the overhead bridge crane from collapsing onto spent fuel transportation or storage cask systems due to these weather events.

This section describes loads, loading combinations and analysis methods to be met for design of the WCS CISF reinforced concrete and structural steel structures.

Loads

Loads used in analysis and design of CHB structure include the following:

- *D Dead load*
- *L Live load*
- *H lateral soil pressure load*
- *T_o Thermal load*
- *W Wind load*
- *F' Flood load*
- *E' Design Basis Earthquake seismic load*

Load Definitions

- ***Dead Load*** *– Defined as any load, including related internal moments and forces, that is constant in magnitude, orientation, and point of application. Dead loads include the mass of the structure, and any permanent equipment loads. The effects of differential settlement are considered when determining dead loads. In addition, a minimum uniform load allowance of 20 lb/ft^2 is applied to roof areas to account for miscellaneous electrical conduits, handrails and ladders for which the actual dead load contribution is not precisely known at the time the analysis or design is performed.*
- ***Live Load*** *– Defined as any normal load, including related internal moments and forces that may vary with intensity, orientation and/or location of application. Movable equipment loads, loads due to vibration and any support movement effects and operating load are types of live loads. The following descriptions provide design requirements for various types of live loads.*
  - ***Rain, Snow and Ice*** *– Described in Chapter 3, the design live load due to rain, snow, and ice is 10 lb/ft^2 which is the ground snow load. Determination of roof snow and ice loads is in accordance with the requirements of*

All indicated changes are in response to RSI NP-4.7

American Society of Civil Engineers (ASCE) Standard 7-05 [7-34].

- ***Transportation Vehicle Loads and Heavy Floor Loads** – Loads due to vehicular truck and rail traffic in designated building areas are in accordance with standard loadings defined by the American Association of State Highway and transportation Officials (AASHTO) and by the American Railway Engineers Association. Special heavy loading conditions resulting from transport of SNF and storage casks on truck and rail transporters/carriages are considered. Design basis cask weights bound the worst-case condition of all vendor designs handled at the WCS CISF. Floor loadings from transportation, transfer and storage mode casks are also considered, along with sufficient allowance for any impact resulting from placing the moving loads on the floor or other areas of the structure. Within the building, the floor under the Canister Transfer System will be designed to handle the specific loads produced by the hydraulic gantry system.*
- ***Crane and Hoist Loads** – Design loads for the transfer facility permanently installed cranes and hoists envelop the fully-rated capacity of the equipment, including allowances for impact loads and test load requirements. The rated capacity of each of the two overhead bridge cranes in the transfer facility is 130 tons. Crane test loads are considered in the design at 125% of the rated capacity of the cranes, increased by an additional 15% to account for impact. Minimum lateral design loads on crane runway supports are 20% of the sum of the rated hoist capacity, plus the weight of the crane trolley to account for the effects of the moving trolley. The lateral load on crane supports is determined by applying the load at the top of the rail in either direction, and distributing it according to the relative stiffness of the end supports. Minimum longitudinal design loads on supports for each crane rail are 10% of the maximum crane wheel load. Seismic effects considered on fully loaded cranes and hoists are also included as described in Section 7.5.3.7.*
- ***Floor Live Loads** – A floor live load of 300 lb/ft^2 is applied in areas of heavy operation in the CHB.*

- ***Hydrostatic Fluid Pressure Loads** – Are due to fluids held in internal building compartments, such as tanks. There are no reinforced concrete tanks in the transfer facility. All tanks located in the transfer facility are designed in accordance with mechanical equipment design criteria.*
- ***Soil Load (H)** - Based on the density of the soil and includes the effects of groundwater, see attachment E of the WCS CISF SAR Chapter 2. Since the WCS CISF site is a dry, relatively flat site and the CHB is a slab-on-grade structure, no groundwater or soil pressure loads are exerted on building structures. Therefore, determination of lateral soil pressure loads is not necessary for structural analysis or design.*

All indicated changes are in response to RSI NP-4.7

- ***Thermal Load (T_o)*** *– Consist of thermally induced forces and moments resulting from operation and environmental conditions affecting the dry storage components and transfer facility building structure. Thermal loads are based on the most critical transient or steady-state condition. Thermal expansion loads due to axial restraint, as well as loads resulting from thermal gradients, are considered. The ambient temperature values during normal operating conditions identified in Chapter 3 are used for structural analysis and design.*

- ***Wind Loads (W)*** *– Are those pressure loads generated by the design wind. These loads do not incorporate any loads associated with tornados. The basic wind speed used to determine design wind loads on the CHB walls and roof areas is 90 mph.*

  Wind loads are determined in accordance with the requirements of ASCE Standard 7-05 [7-34], Section 6. The velocity pressures (q_z) for the transfer facility main wind-force resisting structures and the dry storage systems determined in accordance with ASCE Standard 7-05, Equation 6-15. Design basis wind pressures for each component are computed using the methodology of Section 6.4 either Method 1 (Simplified Method) or Method 2 (Analytical Method) of ASCE Standard 7-05 for the configuration and dimensions of each component.

  $q_z = 0.00256 K_z K_{zt} K_d V^2 I = 27.9\ lb/ft^2$

  where:

  K_z = *normal wind velocity pressure exposure coefficient for different heights above ground, from Table 6-3 of ASCE Standard 7-05, Exposure Category C, since the WCS CISF site is flat, h = 70 feet above ground and exposure C, gives $K_z = 1.17$.*

  K_{zt} = *topographic factor from section 6.5.7.1, ASCE Standard 7-05, $K_{zt} = 1.0$*

  K_d = *wind direction factor, from Section 6.5.4.4 ASCE Standard 7-05, $K_d = 1.0$*

  I = *importance factor for normal wind load determination of 1.15 for important-to-safety SSC (Category IV) as defined in ASCE Standard 7-05 Table 6-1*

  V = *basic wind speed = 90 mph, ASCE Standard 7-05 Figure 6-1*

- ***Flood Loads (F')*** *– Are due to exterior flood waters from the design-basis flood exerting forces and moments on exterior buildings structures, or entering a building and exerting loads on interior building structures. As described in Chapter 2, the CHB finished floor elevation is above the PMF elevation and flood loads are not applicable.*

All indicated changes are in response to RSI NP-4.7

- ***Seismic Loads (E')*** – *Loads are determined by the IBC. The Maximum Considered Earthquake Ground Motion was used to develop the Design Earthquake Ground Motion for which the CHB structure will be proportioned to resist. The building is classified within IBC as Seismic Design Category C. This classification is based on the Design Earthquake Ground Motion and the Occupancy Category of the building. The Occupancy Category of the building has been assigned as IV (Building determined to be an essential facility). The Design spectral response acceleration (short periods) is established at 0.21g and the design spectral response acceleration (1-second period) is established at 0.05g. These accelerations will be used in the analysis and design of the building structure, crane supports, and seismic clips used as restraint for the overhead bridge crane and trolley.*

7.5.3.2.1 Reinforced Concrete Load Combinations

Concrete sections for the CHB foundation and slab will be designed in accordance with ultimate strength design methods as specified in ACI 318 [7-39]. Design of ITS embedded plates and concrete anchors are in accordance with the requirements of ACI 318, Appendix D.

Load combinations used for the design of reinforced concrete components of the WCS CISF CHB will follow those specified in IBC Section 1605.

7.5.3.2.2 Structural Steel Loading Combinations

Steel sections for the CHB structure will be designed in accordance with AISC 360 [7-62]. Load combinations used for the design of structural steel components of the WCS CISF CHB will follow those specified in IBC Section 1605.

7.5.3.3 Reinforced Concrete Structural Analysis and Design

The Cask Handling Building reinforced concrete foundations are analyzed and designed to resist the loads and loading combinations specified in Section 7.5.3.2. A computer model will be generated and used to analyze the CHB for appropriate loading conditions. Construction of the reinforced concrete components will be in accordance with ACI 318-08 [7-39].

The Cask Transfer System (CTS) is a standalone hydraulic gantry system that will be housed in the CHB. The CTS is independent of the CHB structural system. The CHB slab-on-grade and foundations will be designed to accommodate the CTS mat foundation that is isolated from the building foundation. The CTS and its foundation will be designed to meet the requirements of the CTS as described in Section 7.5.1.

All indicated changes are in response to RSI NP-4.7

7.5.3.4 *Structural Steel Design*

Structural steel beams are provided in the CHB along the crane runways to support the rails for two 130-ton capacity overhead bridge cranes. The steel crane runway support beams are classified as category C Important to Radiological Safety since they provide support for the overhead cranes during a seismic event and prevent the cranes falling onto the transportation cask stations. The steel crane runway support beams are supported on steel columns that are tied to the main structural steel columns of the CHB on one end and steel brackets that protrude from the main structural steel columns of the CHB at the other end. In order to provide lateral support for the steel crane runway support beams, tie members are provided between the steel beams and the CHB frame to resist lateral forces on the steel beams due to crane trolley movement and seismic thrust loads. The steel crane runway support beams are shown in plan on Figure 1-7 and in elevation on Figure 1-8.

The CHB steel crane runway support beams are constructed using ASTM A992 and A36 mild carbon steel rolled shapes and/or plate sections. Standard carbon steel crane rails are connected by bolts to the top flanges of the steel crane runway support beams. All bolts used for primary structural connections are either A325 or A490. Welding electrodes are compatible with the joined materials.

7.5.3.5 *Not Used*

7.5.3.6 *Not Used*

7.5.3.7 *Structural Analysis and Design*

CHB structural steel components are analyzed and designed to resist the specified loading combinations. Static analysis methods are used for determining forces and moments on structural steel members as a result of applied service loading conditions. Dynamic analysis methods are used for determining structural steel member forces and moments for factored loading conditions where structural components are subjected to seismic loads.

The steel crane runway support beams are included in the structural system analysis model. Beams are analyzed and designed for worst-case crane wheel loads, assuming both of the overhead bridge cranes are fully loaded to their rated capacity. Loadings on the beams from the cranes are appropriately increased for impact effects as described in Section 7.5.3.2 for live crane and hoist loads. Both cranes are assumed to be fully loaded during a seismic event, the full weights of the cranes are considered in contributing mass during seismic events, and the full weight of the suspended load on each crane is considered for vertical participation during seismic events. To account for the pendulum effect of the flexible cabling that supports the suspended load on each crane, lateral seismic load contributions from the 130-ton suspended loads are considered to be similar to lateral effects due to trolley movement. That is, 20% of the suspended load is applied horizontally in the direction perpendicular to

All indicated changes are in response to RSI NP-4.7

the steel crane runway support beams and 10% of the suspended load is applied horizontally along the longitudinal axis of the steel crane runway support beams.

The positions of the cranes are varied along the crane runways to determine the worst case for maximum stresses on the steel crane runway support beams. To determine worst-case loadings on the beams, crane lifting trolleys are positioned to one side of each crane with the two cranes adjacent to each other. In addition, the worst-case location of the overhead bridge cranes is determined for the overall structure design.

7.5.3.8 On-Site Accidents

WCS CISF-initiated explosions are not considered credible since insufficient explosive materials are present to initiate an event that would result in the destruction of the building. During operations, the amount of flammable liquids that are in the CHB will be administratively controlled to ensure the amount of flammable liquids is maintained below the fire load limits for the respective systems (e.g., 300 gallons of diesel fuel for NUHOMS®). In combination with fuel limitations and a fire suppression system, the fire hazard for the building is adequately mitigated (see WCS CISF SAR Section 3.3.1.8).

7.5.3.9 Off-Site Accidents

Off-site accidents are addressed in WCS CISF SAR Section 12.2.2.

All indicated changes are in response to RSI NP-4.7

Table 7-1
WCS CISF Structures and QA Classification

Structure	QA Classification
Storage Overpacks (VCCs and HSMs), Transfer Casks	Important-to-Safety
Cask Handling Building	*Important-to-Safety*
Cask Handling Building Overhead Cranes	Not important to safety
Canister Transfer System	Important-to-Safety
Storage pads, NUHOMS® Systems	Not important to safety
Storage pads, VCCs	Important-to-Safety
NUHOMS® Transfer Equipment (Except Transfer Cask)	Not important to safety
Vertical Cask Transporter	Important-to-Safety

All indicated changes are in response to RSI NP-4.7

Table 7-25
Cask Handling Building SSCs and QA Classification

SSC	*QA Classification*
Building Structural steel	*Important-to-Safety*
Overhead Crane Support Beams	*Important-to-Safety*
Concrete Foundations and Slab on Grade	*Important-to-Safety*
Overhead Crane Bridge Trucks and Trolley Seismic Clips	*Important-to-Safety*
Overhead Cranes	*Not Important-to-Safety*
Building Classing	*Not Important-to-Safety*
Electrical Systems	*Not Important-to-Safety*
Mechanical and HVAC Systems	*Not Important-to-Safety*
Fire Protection System	*Not Important-to-Safety*

All indicated changes are in response to RSI NP-4.7

Table 7-26
Deleted

Table 7-27
Deleted

Table 7-28
Deleted

All indicated changes are in response to RSI NP-4.7

Permian Basin Materials LLC is a quarry located northwest of the facility. The quarry periodically employs blasting techniques for quarrying materials; however, this is outsourced to a third party and no explosives are stored onsite. The quarry is located beyond 1,660 feet from the proposed CISF and thus any accidental explosions would not produce overpressures greater than 1 psi to cause damage at the CISF.

Immediately south of the proposed WCS CISF is the currently operating WCS commercial waste disposal facility. The site has two propane tanks that are 2,600 gallons and 1,000 gallons and several smaller propane tanks. The explosion and vapor clouds of these propane tanks would not impact the CISF. Listed below are the distances of various gasoline and diesel storage locations that could be a potential explosion source; however, each location is over 1,660 feet (0.31 mile) from the CISF and none of the locations have quantities that would create overpressures in excess of 1 psi at the CISF.

WCS Gasoline and Diesel Locations, Quantities and Distance from proposed CISF:

- *Mixed Waste Treatment Facility (MWTF) – Gas Storage Tank – 5,000 gallons – 4,732 feet from CISF*
- *MWTF – Diesel Storage Tank – 8,000 gallons – 4,732 feet from CISF*
- *MWTF – Diesel Storage Tank (Green Fuel) – 500 gallons – 4,732 feet from CISF*
- *Low Level Radioactive Waste Facility – Diesel Storage Tank – 3,384 gallons – 3,478 feet from CISF*
- *Fire Pump – 850 gallons Diesel – 3,205 feet from CISF*
- *4 Generators – Diesel – 350 gallons each – 3,205 feet to 5,885 feet from CISF*
- *3 Mobile Storage Tanks – Diesel – 475 gallons each – 3,483 feet to 7,777 feet from CISF*

Oil industry pipelines are located near the facility. Based on detailed probabilistic analysis by the neighboring URENCO facility, the hazards due to thermal radiation, missile generation and plant contamination by gas and/or explosion were shown to have an annual probability less than 1.0E-5 thus, by definition, meet the definition of 'highly unlikely' (see Section 3.2.2.4 of the URENCO ISA) [12-4]. The chance of oil industry pipeline explosion affecting the WCS CISF site is highly unlikely.

12.2.3 Adiabatic Heat Up/Blockage of Air Inlets/Outlets

The accident evaluated in the Appendices Chapter 12 (e.g., A.12, B.12, etc.) for each system that considers adiabatic heat up is the "Blockage of Air Inlets/Outlets." An accident scenario using the blockage of air inlets and outlets to analyze adiabatic heat up is consistent with the guidance given to NRC reviewers in NUREG 1567 [12-5].

All indicated changes are in response to RSI NP-4.7