

Enclosure 7

**Draft RAI Responses to RAIs NP-2.2-1, NP-2.2-2
and EP-X
(Non-Proprietary Version)**

Safety Analysis Report (SAR), Chapter 2, "Site Characteristics"**RAI NP-2.2-1:**

Provide an evaluation and aircraft crash probability impact analysis of airway V68, which passes nearby the proposed WCS CISF, in accordance with guidance and acceptance criteria provided in NUREG-1567, Section 2.4.2.

During the NRC staff's review of the information presented in WCS CISF SAR Section 2.2, "Nearby Industrial, Transportation and Military Facilities," the NRC staff identified an airway V68 passing nearby the proposed WCS CISF, which is not addressed by ISP. The closest airport identified is the Lea County Airport, which is 18 miles from the WCS CISF. Provide an analysis and evaluation of airway V68 and incorporate the changes, as appropriate in the application.

This information is needed to determine compliance with 10 CFR 72.94.

Response to RAI NP-2.2-1:

ISP performed an aircraft hazards evaluation for the WCS CISF and added a summary of that evaluation in new SAR Section 2.2.1, Aircraft Hazard Evaluation. The evaluation uses the guidance in NUREG-0800. The evaluation results, based on site-specific flight information and nearby airport locations, indicate that the annual probability of aircraft crash at the WCS CISF is approximately $3.81\text{E-}7$. Using an alternative conservative approach (i.e., that all flights pass over the site), the annual probability of occurrence is computed to be less than $7.38\text{E-}7$. Both probabilities are below the NRC annual probability of occurrence threshold of $1.0\text{E-}6$ for aircraft crash as articulated in NRC Memorandum and Order CLI-01-22. On this basis, ISP concludes that aircraft crash presents low risk to public health and safety and is therefore not necessary to be included as a design basis consideration. SAR Section 2.8 References has also been updated to include the new references added in Section 2.2.1. Also included with the RAI response is a copy of the Proprietary Aircraft Hazard Evaluation Report which forms the basis for SAR Section 2.2.1.

References:

U.S. Nuclear Regulatory Commission, "NUREG-0800, 3.5.1.6 Aircraft Hazards, R4," 2010.

U.S. Nuclear Regulatory Commission, "Memorandum and Order CLI-01-22 in the Matter of Independent Spent Fuel Storage Installation," 2001.

Impact:

SAR Sections 2.2 and 2.8 have been revised as described in the response.

SAR Section 2.2.1 has been added as described in the response.

SAR Table 2-14, Table 2-15, Table 2-16, Table 2-17, Table 2-18, and Table 2-19 have been added as described in the response.

SAR Figure 2-38, Figure 2-39, and Figure 2-40 have been added as described in the response.

2.2 Nearby Industrial, Transportation and Military Facilities

The only industrial facilities located within five miles of the WCS CISF boundary are URENCO USA, Permian Basin Materials, the Lea County landfill, a future travel stop and Sundance Services, Inc. (Figure 2-3). URENCO USA is a uranium enrichment facility that uses centrifuge technology to provide uranium enrichment services. Waste Control Specialists operates several permitted and licensed facilities immediately south of the WCS CISF, including a RCRA landfill, a low-level radioactive waste facility and a byproduct materials landfill.

Permian Basin Materials operates a quarry and crushing operation, wherein caliche, sand and gravel are mined, crushed and screened for commercial sales and used in making concrete (Permian, 2016[2-29]). Sundance Services, Inc. provides oilfield waste disposal services. Sundance Services is authorized by the New Mexico Energy, Minerals and Natural Resources Department to operate the waste oil treating plant, and also manages produced water, solids and drilling muds. Sundance Services is also authorized to landfarm solids (Sundance, 2016[2-30]).

The Lea County (New Mexico) Municipal Landfill is located to the southwest and across New Mexico Highway 234 from WCS CISF. This landfill disposes of municipal solid waste for the Lea County Solid Waste Authority under New Mexico Environmental Department Permit Number SW-98-08(P). The landfill services Lea County and its municipalities. The Lea County Municipal Landfill does not generate or receive hazardous waste (Lea, 2016[2-16]).

Construction has started on a travel stop operated by Love's Travel Stops & Country Stores located at the intersection of New Mexico State Highway 18 and Hwy 176. This facility, which will provide fuel for highway vehicles, is located more than 3.5 miles from the WCS CISF.

DD Landfarm, a non-hazardous oilfield waste disposal facility that closed in August 2013 and is undergoing decommissioning and post-closure monitoring, is located approximately 4 km (2.5 miles) west of the proposed WCS CISF.

There are no military facilities within a mile of the WCS CISF. The closest military facility is Cannon Air Force Base is the closest at a distance of approximately 135 miles.

The Texas & New Mexico Railway (TXN) is a railway consisting of 111 miles of track that generally run north-south between the Union Pacific lines in Monahans, Texas and its termination in Lovington, New Mexico. The railway is 4.8 miles from the WCS CISF at its closest point. The existing Waste Control Specialists railroad spur and loop exits the Texas & New Mexico Railway near Eunice, New Mexico as shown in Figure 2-3. This spur continues east until it reaches the existing Waste Control Specialists facility where it forms a loop around the facility. The rail side track to the WCS CISF will begin by connecting to the northwest side of the existing loop and terminate by re-connecting at the north side of the loop.

Texas State Highway 176 is a two-lane highway with 3.6 m (12 foot) wide driving lanes, 2.4 m (8 foot) wide shoulders and a 61m (200 foot) wide right-of-way easement on each side. Access to the site is directly off of Texas State Highway 176. Texas State Highway 176 is approximately 1.5 miles from the WCS CISF. New Mexico Highway 18 is a four-lane highway approximately 3.5 miles from the WCS CISF.

A natural gas pipeline owned by Energy Transfer LP runs parallel to Texas State Highway 176 within an easement on Waste Control Specialists property. The pipeline is approximately 7,700 feet from the WCS CISF at its closest point. Directly adjacent to and parallel to the Energy Transfer LP natural gas pipeline is an additional buried 14 inch diameter pipeline which is in idle status. The pipeline is also owned by Energy Transfer LP and it has been idle for over 15 years. Finally, a 10 inch diameter buried CO2 pipeline runs along the western and northern boundary of New Mexico Section 32. This pipeline is over 8,000 feet from the WCS CISF at its closest point.

In addition to industrial and transportation facilities, gas and oilfield operations are common in west Texas. Regionally, the WCS CISF is located in the Permian Basin of west Texas and southeast New Mexico which is one of the most important petroleum-producing regions in the United States, containing several thousand oil and gas wells [2-56]. Significant petroleum storage, however, is not located within 5 miles of the WCS CISF. Locally within the Waste Control Specialists property boundaries, oil and gas activity also is very limited. There is no active oilfield activity within the WCS CISF footprint area and only one documented dry hole in the immediate area of the WCS CISF (Figure 2-36). That dry hole has been cemented to the surface and proper plugging and abandonment protocol was observed. There is no evidence of any undocumented or "orphan" wells in the vicinity of the WCS CISF. If any open boreholes indicative of orphan wells are discovered during the construction process, these will be properly assessed and remediated using proper plugging and abandonment procedures in accordance with Texas Regulations. ISP joint venture member Waste Control Specialists also holds 100% of the Operating Rights for producing oil, gas, and other minerals for the area of land where the storage pads for Phase I and the future phases of the WCS CISF would be located. These rights allow ISP joint venture member Waste Control Specialists to prevent any drilling (horizontal or vertical) under storage pads for oil, gas, and other minerals. Based on Figure 2-36, 10 out of 12 locations (83%) are dry or no longer producing, which indicates there is little economically viable oil and gas resources within 1 mile of the WCS CISF and chances of petroleum recovery activities in this area are unlikely. As explained in SAR Section 2.6.2 and in the Probabilistic Seismic Hazard Analysis in Attachment D to SAR Chapter 2, it was determined there is a relatively low seismic hazard at the Waste Control Specialists site even with petroleum recovery activities.

SAR Chapter 12 Section 12.2 provides evaluations of the potential hazards these facilities present to the WCS CISF.

2.2.1 Aircraft Hazard Evaluation

ISP performed an aircraft hazards evaluation for the WCS CISF to demonstrate adequate assurance that the risks from aircraft hazards are sufficiently low. NRC regulations pertaining to siting evaluation, 10 CFR 72.90, require that proposed spent fuel storage installations be examined with respect to the frequency and severity of external natural and man-induced events that could affect the safe operation of the facility. The NRC accepts that spent fuel storage installations do not need to be designed to withstand aircraft crashes if there is less than one-in-one-million (1×10^{-6}) annual probability of occurrence [2-42].

For the WCS CISF aircraft hazard evaluation, relevant guidance from Standard Review Plan NUREG 0800 (Section 3.5.1.6-Aircraft Hazards) [2-43] was followed. Although NUREG 0800 is intended for light-water reactor designs, the approach for estimating aircraft hazard is considered to be relevant guidance for the WCS CISF.

This evaluation considers nearby airports, federal airways, holding and approach patterns, military airports, training routes, and training areas. Recorded flight data, taken from a 10 nautical mile (12 mile) radius of the WCS CISF, over a recent two-year period (2017-2018) was reviewed and used to obtain federal airway flight frequencies. Airport and airway locations were determined using flight map information available from the FAA [2-44]. All of the twelve airports within 50 miles of the WCS CISF in the three counties (Andrews County TX, Gaines County TX and Lea County NM) in Texas and New Mexico were identified. There is no military base or airport within 50 miles of the WCS CISF. Federal airway and military training route locations were determined using the FAA Instrument Flight Rules (IFR) Enroute Aeronautical Charts [2-45]. Finally, for this evaluation, the protected area boundary was conservatively increased from 36 acres (0.06 square miles) for phase 1 of this project to envelope the eventual 130 acres (0.21 square miles) of the protected area, effectively covering the additional 98 acres that will be added for the anticipated seven additional phases of the project.

NUREG 0800 Section 3.5.1.6 provides proximity screening criteria for evaluating whether the probability of aircraft crash is less than an order of magnitude to $10E-7$ per year. However, as the WCS CISF site has two Federal airways that pass near enough to the site (V68 and Q20), the conservative NUREG 0800 screening criteria are not satisfied. In this case, NUREG 0800 states that a detailed review of aircraft hazards be performed. The review seeks a description of aviation uses in the airspace near the proposed site, including airports and approach paths, Federal airways, restricted airways, and military uses.

NUREG 0800 Section 3.5.1.6 also provides acceptable methods for calculating the probability per year of an aircraft crashing into the plant. The evaluation considers in-flight crash rate per mile, width of airway, number of flights per year along the airway, and effective area of the site. Similarly, the evaluation considers civilian and military airport locations. The details of the evaluation are described in the sections below.

2.2.1.1 Site Description

The WCS CISF has a protected area boundary of 36 acres (0.06 square miles) which contains the Security and Administration Building, the Cask Handling Building and the Storage Area where the cask shipments arrive, and the canisters are off loaded and placed into storage. As indicated above, for this evaluation, the protected area boundary was increased to 130 acres (0.21 square miles), effectively covering the future seven phases of the project. Therefore, this evaluation is conservative as the actual protected area boundary is only 28% of the effective plant area assumed in this evaluation. The concrete storage casks, which contain canisterized SNF, are positioned on concrete pads located within the protected area boundary. The robust designs of the dry cask storage systems that will be within the protected area boundary provide additional defense-in-depth against radiological release, as these systems are passive (air-cooled) and designed to provide physical protection and radiation shielding.

2.2.1.2 Nearby Federal Airways

NUREG 0800 Section 3.5.1.6 seeks a description of the aviation uses in the airspace near the site. Resources made available from the FAA were used to identify Federal airways within a 10 nautical mile (12 mile) radius of the site. Commercial aircraft flight plans are limited to the Federal Airways that make up the enroute airspace structure of the National Airspace System (NAS). The enroute airspace structure of the NAS consists of three strata. The first stratum low altitude airways in the United States can be navigated using Navigational Aids (NAVAIDs), have names that start with the letter V, and are called Victor Airways. They cover altitudes from approximately 1,200 feet above ground level (AGL) up to, but not including 18,000 feet above mean sea level (MSL). The second stratum high altitude airways in the United States all have names that start with the letter J and are called Jet Routes. These routes run from 18,000 ft to 45,000 ft. The third stratum allows random operations above flight level (FL) 450, i.e. 45,000 ft.

There are also area navigation (RNAV) routes, which provide users with an ability to fly direct routes between any two points. In conjunction with the high-altitude routing (HAR) program, area navigation (RNAV) routes have been established to provide for a systematic flow of air traffic in specific portions of the enroute flight environment. The designator for these RNAV routes begins with the letter Q. Low altitude RNAV only routes are identified by the letter "T" prefix, followed by a three-digit number (T-200 to T-500).

The search within a 10 nautical mile radius identified that there are multiple federal airways near the WCS CISF: V68, Q20, and J66 [2-45]. The low-altitude airway is V68 and the two high-altitude airways are Q20 and J66. These airways are described in more detail as follows:

Low Altitude Airways (Figure 2-38 and Figure 2-39) [2-45]

- V68 is a low-altitude east-west route (113° out of Lea County Regional Airport N32°38.29' W103.16.16' toward Midland Airpark Airport N32°00.56' W102°11.42'). Its centerline passes approximately 4 miles from the plant site and has a width of 9.21 miles (8 nautical miles).

High Altitude Airways (Figure 2-40) [2-45]

- Q20 is a high-altitude northwest-southeast RNAV route (121° out of HONDS, NM N33°34'00', W104°51'12' toward FUSCO, TX N31°10'37' W101°19'45'). Its centerline passes approximately 4 miles from the plant site and has a width of 9.2 miles (8 nautical miles).
- J66 is a high-altitude east-west Jet route (254° out of Big Spring, TX N32°23.14' W101°29.02' toward Newman, TX N31°57.10' W106°16.34'). Its centerline passes approximately 12 miles from the plant site and has a width of 9.2 miles (8 nautical miles).

2.2.1.3 Flight Path Movements

Flight movement data for commercial and general aviation flights was provided by FlightAware, LLC. The spatial extent of data was a 10 nautical mile radius from the site location and covered a two-year time period (from January 1, 2017 to December 3, 2018). The data included information pertaining to aircraft location (latitude/longitude), direction of travel, origin, destination, aircraft type, time, and ground speed.

Table 2-14 provides a summary of flight movements and indicates that there were flight movements in 2017 and 2018, respectively. Note that the data for December 2018 was incomplete so the flight movements of each airway were proportionally extrapolated based on the available data from December 1st to 3rd. Since the flight movements in the first eleven months of 2018 increased by 6.36% compared with those in 2017, the overall flight movements in December 2018 were judged to have the same increase over December 2017 (i.e., 6.36%). Flight movements were segregated into high altitude (>18,000 ft) and low altitude (<18,000 ft) flights. There were a small number of flights with no altitude information provided. These flights are designated as 'other' in Table 2-14.

2.2.1.4 Military Training Routes

Military aircraft would fly within designated Military Training Routes (MTRs), which may or may not be flown under air traffic control. Airspace above the United States from the surface to 10,000 feet above sea level is limited to 250 knots (indicated airspeed) by FAA regulations. There is a military exception to this requirement, the Military Training Route Program, a joint venture by the FAA and the Department of Defense (DOD), developed for use by military aircraft to gain and maintain proficiency in tactical “low-level” flying. These low-level training routes are generally established below 10,000 feet for speeds in excess of 250 knots.

The review of IFR enroute Aeronautical Charts from FAA identified that there is a MTR in the vicinity of the WCS CISF: IR-128 and its reciprocal IR-180 (referred to as IR-128/180) [2-45]. This airway is described as follows:

Military Training Routes (Figure 2-38 and Figure 2-39)

- IR 128/180 is a low-altitude east-west military training route. IR-180 is a clockwise route while IR-128 is the reciprocal counter clockwise route. One of its segments crosses the New Mexico/Texas state border. The centerline of this segment passes approximately 15 miles from the plant site and has a width of 8.1 miles (7 nautical miles, 4 nautical miles on plant side and 3 on the other).

There are other MTRs, IR-178 and IR-192/194, which are further away and not considered in this review. Additional information for IR 128/180, including their distances from the site, is included in Table 2-15.

Military operations were not included in the summary of flight path movements in Table 2-14. The WCS CISF is near the border of two Air Route Traffic Control Centers (ARTCC), ZAB (Albuquerque, NM) and ZFW (Ft. Worth, TX) [2-46]. The total number of flights handled by ZFW and ZAB is provided in Table 2-16. There are approximately 6.36% military operations. It is judged that the ratio of flight classes passing through the WCS CISF site within a 10 nautical mile diameter circle is the same as flight classes handled by ZFW and ZAB. Therefore, the military operations passing through the WCS CISF site 10 nautical mile diameter circle is calculated as 5142 for the year 2018.

2.2.1.5 Airports

In addition to airways, NUREG 0800 Section 3.5.1.6 seeks a description of airports in the vicinity of the site. There are twelve (12) local and regional airports close by the WCS CISF, which are located in Andrews County TX, Gaines County TX, and Lea County NM. These airports are within a 50 nautical mile (57.5 mile) radius of the CIS Facility site. Of these airports, only the Lea County Regional (HOB) airport has a Federal Aviation Administration (FAA) funded air traffic control tower [2-48].

A summary of the airplane operations at airports near the WCS CISF are provided in Table 2-17. Airport operation numbers have been gathered from 2 sources, first is the Air Traffic Activity Data System (ATADS), which contains the official NAS air traffic operations data available for public release [2-44]. The other is GRC Inc.'s AirportIQ 5010 [2-48], which is a compilation of FAA form 5010-5 Airport Master Records and Reports. ATADS gives data as far back as 1990, where AirportIQ gives only the past year's data. Additionally, ATADS only gives data for Airports that have an FAA certified Air traffic control tower, so data for some of the smaller airports has only been sourced from AirportIQ.

Table 2-17 indicates that the closest airport to the site is Lea County Regional Airport (HOB), which is located 4 miles west of Hobbs, NM [2-44] and approximately 18.7 miles northwest from the plant site of the WCS CISF. The Lea County Regional Airport is classified as a small aircraft airport, which primarily serves single engine general aircraft. Recent regional airport statistics (2017) indicate that HOB has approximately 35 flight operations per day [2-48].

As the closest airport to the WCS CISF is approximately 18.7 miles away, it is judged that accidental aircraft crashes, due to airport landing and take-off operations, are low risk. Further, it is noted that NUREG 0800 Section 3.5.1.6 indicates that the probability of general aviation aircraft crash is extremely-low for distances further than 5 miles from end-of-the-runway locations. This observation provides confidence that the risk of airport crash is low, especially for an airport (HOB) that is 18.7 miles from the WCS CISF.

2.2.1.6 Risk Assessment

NUREG 0800 Section 3.5.1.6 provides the approach for estimating the probability per year of an aircraft crashing into the WCSF.

$$P_{FA} = C \times N \times \frac{A}{w}$$

Where

P_{FA} = probability per year of an aircraft crashing into the plant

C = in-flight crash rate per mile for aircraft using airway

N = number of flights per year along the airway

A = effective area of the plant in square miles

w = width of airway (plus twice the distance from the airway edge to the site when the site is outside the airway) in miles

The commercial aircraft in-flight crash rate (per mile airway), 'C', is recommended to be $4.0\text{E-}10$ in NUREG 0800. This crash rate was estimated based on a conservative assumption that a non-catastrophic failure will occur somewhere in the U.S. once per year. NUREG 0800 Section 3.5.1.6 states that if the number of flights on a specific corridor exceed 100 per day, then more detailed analysis may be required. It is noted that the busiest airway near the WSP CISF is high-altitude federal airway J66, which has a minimum distance of 7.6 miles from the WSP CISF. Airway J66 has approximately 157 flights per day. Further, as this airway is a high-altitude ($>18,000$ ft) east-west corridor, it is judged that most flights on this airway are commercial.

The technical basis supporting the NUREG 0800 crash rate value of $4.0\text{E-}10$ was reviewed to ensure that this value was appropriate for the J66 airway. The NUREG 0800 estimate was based on a review of crash rate data for all U.S. air operations between 1965 and 1975 [2-46]. During this time period, the linear average of the aircraft miles flown per year is $2.396\text{E}9$. Based on the conservative assumption of one non-catastrophic failure per year [2-46], the NUREG 0800 aircraft crash rate was derived as the reciprocal of $2.396\text{E}9$, or approximately $4\text{E-}10$.

Flight safety in the U.S. has improved considerably in the last 20 years. During this time period, the FAA reports that commercial aviation fatalities in the U.S. have decreased by 95 percent [2-49]. This improvement in safety is primarily due to technological advances in navigation, FAA regulatory/inspection enhancements, and improvements in the sharing of safety and reliability data.

In addition, the total number of flights in the U.S. has increased considerably. World Bank data indicates that the number of passengers carried on U.S. flights in 2015 is more than 5 times the number in 1970 [2-50]. Based on the significant improvements in flight safety and considerable increase in number of flights in the 20 years (or more), it is judged that the NUREG 0800 value for in-flight crash rate (per mile) of $4\text{E-}10$ can be conservatively assumed for the J66 airway.

As a conservative assumption, the military flights were assumed to be 6.37% of the total flights within the 10 nm radius of the plant. However, it noted that these flights are more likely to be located on the military training routes IR-128/180, which are located at least 10.6 miles away from the WCS CISF (Figure 2-38 and Figure 2-39. In the unlikely event that a military aircraft, loaded with ordnance, crashed on these flight paths, the distance from the plant is such that damage from exploded ordnance would be negligible. On this basis, it is judged that military flights with ordnance are not a risk-significant consideration.

The results of the evaluation are shown in Table 2-18. Based on site-specific flight information and nearby airway locations, the annual probability of aircraft crash at the WCS CISF is approximately $3.81\text{E-}7$. This is lower than the one-in-one-million ($1\text{E-}6$) annual probability of occurrence required by the NRC [2-42].

To provide an additional conservative value of the aircraft impact crash probability, the hypothetical scenario of all airways passing directly over the site was considered. Table 2-19 provides results of the evaluation. The annual probability of aircraft crash at the WCS CISF is approximately $7.38\text{E-}7$, which is also lower than the one-in-one-million (1×10^{-6}) annual probability of occurrence required by the NRC [2-42].

The evaluation results, based on site-specific flight information and nearby airport locations, indicate that the annual probability of aircraft crash at the WCS CISF is approximately $3.81\text{E-}7$. Using a conservative approach (i.e., all flights pass over the site), the annual probability of occurrence is computed to be less than $7.38\text{E-}7$. Both probabilities are below the NRC annual probability of occurrence threshold of $1.0\text{E-}6$ for aircraft crash. An additional conservatism in both approaches is the assumption that the effective area is equivalent to the full size of the protected area (130 acres) versus the actual area size for Phase 1 (36 acres). On this basis, it is judged that aircraft crash presents low risk to public health and safety and is therefore not necessary to be included as a design basis consideration.

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- 2-34 Texas Commission on Environmental Quality Radioactive Material Permit No. 50398. *Permit for Industrial Solid Waste Management Site*. Issued in October 2005.
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- 2-49 “Fact Sheet – Out Front on Airline Safety: Two Decades of Continuous Evolution.” [Online]. Available: https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=22975&omniRss=fact_sheetsAoc&cid=103_F_S. [Accessed: 25-Feb-2019].
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Table 2-14
Summary of Non-military Flight Path Movements (2017 and 2018)

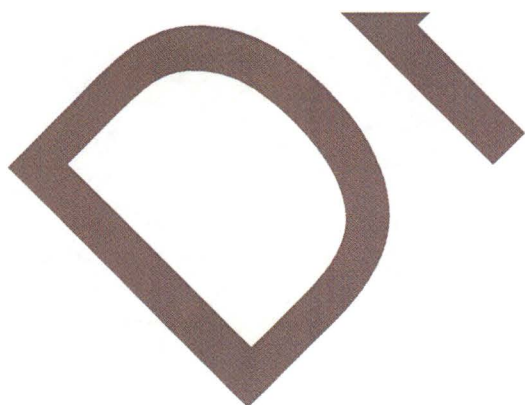


Table 2-15
Nearby Federal Airway and Military Training Route NUREG 0800
Screening

Airway or Pattern	Type	Travel Direction	Distance to Centerline	Width left of center [mi]	Width right of center [mi]	Site side	Distance to nearest edge [mi]
V68	Federal	Either	3.4	4.6	4.6	N/A	Over Site
Q20	Federal	Either	3.7	4.6	4.6	N/A	Over Site
J66	Federal	Either	12.2	4.6	4.6	N/A	7.6
IR-128/ IR-180	MTR	W to E	15.2	4.6	3.5	Left	10.6
	MTR	E to W	15.2	3.5	4.6	Right	

Table 2-16
Military Traffic Handled by ZFW and ZAB in from 1/1/2017 to 12/31/2018

Facility	Air Carrier	Air Taxi	General Aviation	Military	Total
ZFW	2,621,740	782,346	911,447	325,375	4,640,908
ZAB	2,099,849	444,067	485,773	173,764	3,203,453
Total:	4,721,589	1,226,413	1,397,220	499,139	7,844,361
	60.19%	15.63%	17.81%	6.36%	

Table 2-17
Nearby Airport NUREG 0800 Screening

Airports	City, State	Distance from site [mi]	Average Annual Operations	Airport IQ 5010 Operations for 12 months ending:	Operations				Based Aircraft				
					General Aviation (local & itinerant)	Air Taxi	Air Carrier	Military	SE	ME	J	Heli	Ultralight
ANDREWS COUNTY (E11)	Andrews, TX	32.0	6228	4/25/2018	100%				29	2			1
TWO LEGGS (1TA5)	Denver City, TX	34.0	N/A						3				
SEAGRAVES (F97)	Seagraves, TX	46.0	2100	6/20/2018	100%				7				
GAINES COUNTY (GNC)	Seminole, TX	28.3	12125	4/26/2018	99%	1%			16	3			
HAMILTON AIRCRAFT, INC (5TA0)	Seminole, TX	20.5	N/A						3				
SEMINOLE SPRAYING SERVICE (39TE)	Seminole, TX	26.2	2000	N/A	100%				6				
INDUSTRIAL AIRPARK (NM83)	Hobbs, NM	23.4	N/A						11	1			1
LEA COUNTY RGNL (HOB)	Hobbs, NM	18.7	12745	04/01/2017	68%	16%	9%	7%	41	6	5	1	
LEA COUNTY/JAL/ (E26)	Jal, NM	22.9	3000	04/04/2017	100%				7	1	1		
LEA COUNTY-ZIP FRANKLIN MEMORIAL(E06)	Lovington, NM	40.2	2200	04/03/2017	100%				11	1			
NOR LEA COUNTY GENERAL HOSPITAL (NM94)	Lovington, NM	39.2	0	12/30/2004									
TATUM (18T)	Tatum, NM	57.3	500	04/03/2017	100%				3				

Table 2-18
Results of Aircraft Hazard Evaluation (Airways Considered Separately)

Variable Description	Variable	Units	Low Altitude (V68 & other)	High Altitude		Military (6.36%)	Flight data w/o altitude#	Total
				J66 (W-E)	Q20 & Other			
Inflight Crash Rate(NUREG-0800)	C	mi ⁻¹	4.00E-10	4.00E-10	4.00E-10	4.00E-10	4.00E-10	
Aircraft Operations within 10 nautical miles of WCS CISF in 2018	N	yr ⁻¹				5142		
Width of Airway	w	mi	9.2	24.2	9.2	29.3	9.2	
Area of WCS CISF	A	mi ²	0.21	0.21	0.21	0.21	0.21	
Probability of inflight aircraft impacting WCS CISF	P ^{FA}	yr ⁻¹				1.47E-08		3.81E-07

Table 2-19
Probability of Inflight Aircraft Impacting WCS CISF (All airways pass over the site)

Variable Description	Variable	Units	Air Carrier	Air Taxi	General Aviation	Military	Total
Inflight Crash Rate (NUREG-0800)	C	mi ⁻¹	4.00E-10	4.00E-10	4.00E-10	4.00E-10	
Aircraft Class		-	60.19%	15.63%	17.81%	6.36%	
Aircraft Operations within 10 nautical miles of WCS CISF in 2018	N	yr ⁻¹				5142	
Width of Airway	w	mi	9.2	9.2	9.2	9.2	
Area of WCS CISF	A	mi ²	0.21	0.21	0.21	0.21	
Probability of inflight aircraft impacting WCS CISF	P ^{FA}	yr ⁻¹				4.69E-08	7.38E-07

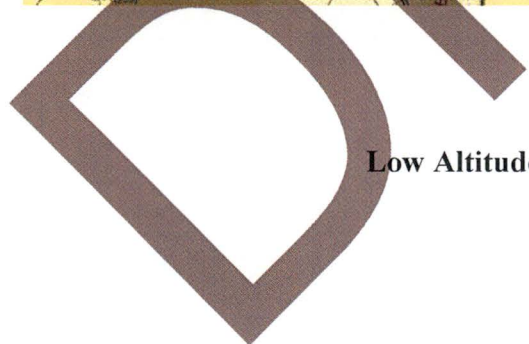


Figure 2-38

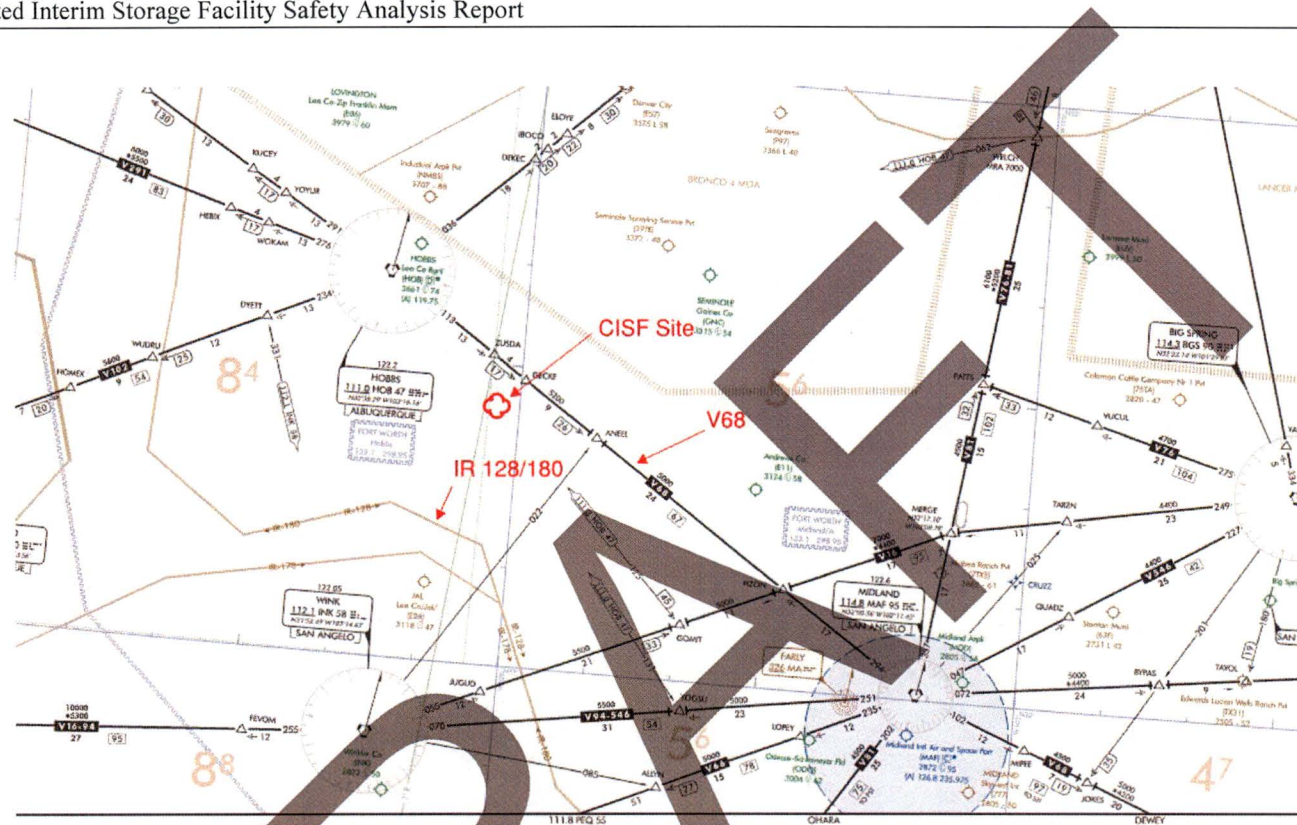
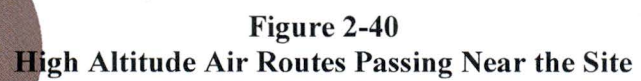


Figure 2-39
Low Altitude Air Routes Passing Near the Site



RAI NP-2.2-2:

Provide the locations of nearby industrial, transportation, military, and nuclear installations. Describe potential hazards to the proposed WCS CISF from activities or materials at those facilities in accordance with the guidance and acceptance criteria provided in NUREG-1567, Section 2.4.2.

During the NRC staff's review, the NRC staff determined that ISP identified nearby facilities, but did not provide potential impact evaluations of these facilities on the proposed WCS CISF. Specifically, ISP identified a railroad, but did not provide details on products/materials transported by rail; the distance of the rail line from the proposed facility; or the potential impacts (if any) on the proposed facility. ISP identified Texas State Highway 176, but not the shortest distance between the highway and the proposed facility. ISP stated oil industry pipelines are located near the facility in WCS CISF SAR Section 12.2.2, but did not provide details as to what materials are transported in the pipelines; the distance of the pipelines from the proposed facility; or the impacts of the pipelines on the proposed facility. Different materials can be transported through these pipelines and these different materials can pose different potential hazards to the site.

Also, in accordance with SRP Section 15.5.2.10, ISP should analyze whether the effects of hazards near the site have been addressed as part of the WCS CISF design basis. When evaluating which external hazards should be considered in the design bases for the WCS CISF, ISP should use a screening criteria of 10^{-6} annual probability of exceeding the applicable dose criteria, not $1.0\text{E-}5$, as stated in SAR Section 12.2.2. This criteria was established by the Commission for ISFSI's in the Private Fuel Storage proceeding (CLI-01-22) and further elucidated in CLI-05-19.

If the required impact evaluations are performed in some other section of the SAR, the NRC staff requests that these evaluations be cross referenced in SAR Section 2.2, pointing to where the evaluations are performed and conclusions are addressed for clarity. Provide a revised WCS CISF SAR Section 2.2, with details, additional analyses, and conclusions, as appropriate, by cross referencing the impact evaluations that are presented in Chapter 12, "Accidents Analysis," of the WCS CISF SAR.

This information is needed to determine compliance with 10 CFR 72.94.

Response to RAI NP-2.2-2:

In accordance with the guidance and acceptance criteria provided in NUREG-1567, Section 2.4.2, facilities within an 8-km (5-mi) radius and all relevant facilities at greater distances should be included in an evaluation of nearby industrial, transportation, and military facilities. In addition to the facilities mentioned in SAR Section 2.2, the section, along with Section 12.3 References, is revised to include New Mexico State Highway 18, the Texas & New Mexico Railway, a future travel stop, the Waste Control Specialists' rail spur and loop, and the natural gas pipeline that runs parallel to Texas State Highway 176. Figure 2-3 in the WCS CISF SAR is revised to include relevant facilities within an 8-km (5-mile) radius.

In addition to industrial and transportation facilities, gas and oilfield operations are common in west Texas. Regionally, the WCS CISF is located in the Permian Basin of west Texas and southeast New Mexico which is one of the most important petroleum-producing regions in the United States, containing several thousand oil and gas wells (Dutton et al, 2005) [3]. Significant petroleum storage, however, is not located within 5 miles of the WCS CISF. Locally within the Waste Control Specialists property boundaries, oil and gas activity also is very limited. There is no active oilfield activity within the WCS CISF footprint area and only one documented dry hole in the immediate area of the WCS CISF (New SAR Figure 2-36). That dry hole has been cemented to the surface and proper plugging and abandonment protocol was observed. There is no evidence of undocumented or "orphan" wells in the vicinity of the WCS CISF. If any open boreholes indicative of orphan wells are discovered during the construction process, these will be properly assessed and remediated using proper plugging and abandonment procedures in accordance with Texas Regulations. ISP joint venture member Waste Control Specialists also holds 100% of the Operating Rights for producing oil, gas, and other minerals for the area of land where the storage pads for Phase I and the future phases of the WCS CISF would be located. These rights allow ISP joint venture member Waste Control Specialists to prevent any drilling (horizontal or vertical) under storage pads for oil, gas, and other minerals. RAI NP-2.6-1 details why sinkholes associated with wells in the region are not likely at the WCS CISF. In Figure 1 below, a 2014 survey by The Banks Group (www.banksinfo.com) of oil and gas wells within 1 mile of the WCS CISF shows that two (2) dry holes were drilled and one (1) well is no longer producing. Just outside the 1-mile radius of the WCS CISF are an additional four (4) dry holes and two (2) wells that are no longer producing. Based on the map of oil and gas activity around the WCS CISF, 10 out of 12 locations (83%) are dry or no longer producing, which indicates there is little economically viable oil and gas resources within 1 mile of the WCS CISF and therefore further petroleum recovery activities in this area are unlikely. As explained in SAR Section 2.6.2 and in the Probabilistic Seismic Hazard Analysis in Attachment D to SAR Chapter 2, it was determined there is a relatively low seismic hazard at the WCS CISF even with petroleum recovery activities.

As referenced in Section 12.2.2 of the WCS CISF SAR Chapter 12, Regulatory Guide 1.91, Evaluations of Explosions Postulated to Occur at Nearby facilities and on Transportation Routes near Nuclear Power Plants, Revision 2, was used to determine distances from nearby facilities or transportation routes beyond which any explosion that might occur is not likely to have an adverse effect on WCS CISF SSCs important-to-safety. The guidance in Regulatory Guide 1.91 is based on limiting the overpressure at SSCs to less than 1 psi from any explosion. The magnitude of explosions involving solid or liquid material is calculated by converting the weight of potentially explosive materials to their TNT equivalence. Per Regulatory Guide 1.91, a more detailed review of transporting explosive materials on these transportation routes would not be required beyond demonstrating that the overpressures at the WCS CISF can be shown not to exceed 1 psi for any explosion.

The nearest truck transportation routes include New Mexico Highway 18 to the west of the WCS CISF and Texas Highway 176 which is to the south of the WCS CISF. New Mexico Highway 18 is approximately 3.5 miles from the WCS CISF and Texas Highway 176 is approximately 1.5 miles (8000 feet) at the closest point to the WCS CISF.

Using the methodology of Regulatory Guide 1.91, the maximum probable hazardous solid cargo for a single highway truck is 50,000 lbs, and detonation of this quantity of explosive could produce a 1 psi overpressure at a distance of approximately 1,660 ft (0.31 mile) from the detonation, which is well short of the WCS CISF.

The Texas & New Mexico Railway (TXN) is a rail way consisting of 111 miles of track that run generally north-south between the Union Pacific lines in Monahans, Texas and its termination in Lovington, New Mexico. This rail line, at its closest point, is approximately 4.8 miles from the west OCA boundary of the WCS CISF. The rail line typically carries oilfield commodities including drilling mud, hydrochloric acid, fracking sand, Piping, And Petroleum Products Including Crude Oil.

Regulatory Guide 1.91, Evaluations of Explosions Postulated to Occur at Nearby Facilities and on Transportation Routes near Nuclear Power Plants, Revision 2, was used to determine distances from nearby facilities or transportation routes beyond which any explosion that might occur is not likely to have an adverse effect on WCS CISF SSCs important-to-safety. The guidance in Regulatory Guide 1.91 is based on limiting the overpressure at SSCs to less than 1 psi from any explosion. The magnitude of explosions of solid or liquid materials is calculated by converting the weight of potentially explosive materials to their TNT equivalence.

Using the methodology of Regulatory Guide 1.91, the maximum weight of solid explosive cargo (which bounds liquid cargo) for a single box car is 132,000 lbs, and detonation of this quantity of explosive (using its TNT equivalence) could produce a 1 psi overpressure at a distance of approximately 2,300 ft (0.44 mile) from the detonation. Considering for the possibility that multiple boxcars of explosive material are connected in a single train and multiple boxcars explode in the same event shows that ten completely full boxcars exploding in the same event produce 1 psi of overpressure at a distance of 5,000 feet from the detonation. This distance is much shorter than the distance to the WCS CISF. The weight of explosive material required to exceed 1 psi of overpressure at the WCS CISF makes the situation extremely unlikely under normal transportation conditions due to the configuration limitations (as the length of the train increases each successive rail car gets further away from the WCS CISF).

The Waste Control Specialists rail spur and loop exits the Texas & New Mexico Railway near Eunice, New Mexico as shown in updated Figure 2-3. This spur continues east until it reaches the existing Waste Control Specialists facility where it forms a loop around the facility. The rail side track to the WCS CISF will begin by connecting to the northwest side of the existing loop and terminate by re-connecting at the north side of the loop. This rail line is completely controlled by ISP joint venture member Waste Control Specialists and limited to approved Waste Control Specialists waste shipments and transport casks. Railcars carrying contents with the potential to adversely affect the WCS CISF will not be permitted on the Waste Control Specialists rail spur and loop. Fire and explosion precautions for the WCS CISF rail side track are discussed in Section 3.3.6 of the SAR.

A natural gas pipeline owned by Energy Transfer LP (previously owned by Sid Richardson Energy Services Company) runs parallel to Texas State Hwy 176 within an easement on Waste Control Specialists property. This pipeline is approximately 7,700 feet from the WCS CISF at its closest point. An evaluation assessing the hazards to the WCS CISF due to a pipeline leak and subsequent vapor cloud explosion following the guidance of Regulatory Guide 1.91 determined that the distance between the pipeline and the WCS CISF is sufficient to preclude any adverse impacts to the facility. (Reference [4]) Reference [4] is being submitted along with this response for information.

Directly adjacent to (within 30 feet) and parallel to the Energy Transfer LP natural gas pipeline is an additional buried 14 inch diameter natural gas pipeline which is in idle status. This pipeline is also owned by Energy Transfer LP and it has been idle since before 2004. Should this pipeline be re-activated in the future, the hazard evaluation performed for the adjacent natural gas pipeline would apply to this as well.

There is a 10 inch diameter buried CO₂ pipeline which runs along the western and southern boundary of New Mexico Section 32. This pipeline does not present a hazard to the WCS CISF based on the nature of the pipeline product and its distance from the WCS CISF which is more than 8,000 feet at its closest point.

Love's Travel Stops & Country Stores has started construction on a travel stop in New Mexico at the southeast corner of the intersection of New Mexico Highway 18 and Hwy 176. The Travel Stop will store up to 40,000 gallons of diesel fuel, 28,000 gallons of gasoline, and up to 12,000 gallons of non-flammable Diesel Exhaust Fluid (DEF) in underground tanks. Emergency Response Guide 128 recommends a 0.5 mile safe distance for ignitable liquid tank fires which is much less than the 3.5 mile distance from the Travel Stop to the closest point at the WCS CISF boundary.

SAR Section 12.2.2 is updated, along with Section 12.3 References, to include discussion of potential risks from the Texas & New Mexico Railway and the Love's travel stop. In addition, the pipeline owned by Energy Transfer LP is added and identified as carrying natural gas. Evaluation of potential hazards to the WCS CISF from these sources is added to the section.

Section 2.2 of the SAR is updated to include discussion of New Mexico State Highway 18, the Texas & New Mexico Railway, the Energy Transfer LP pipeline, the Love's travel stop, and reference to the evaluations discussed in Section 12.2.2. Figure 2-3 is updated to include facilities within a radius of 8-km (5-miles).

References:

1. U.S. Nuclear Regulatory Commission Regulatory Guide 1.91, Evaluations of Explosions Postulated to Occur at Nearby Facilities and on Transportation Routes near Nuclear Power Plants, Revision 2, July 2013
2. Emergency Response Guide 128, Emergency Response Guidebook (2016), U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
3. Dutton et. al., 2005, Play analysis and leading-edge oil-reservoir development methods in the Permian basin: Increased recovery through advanced technologies. AAPG Bulletin, v.89, No. 5 (May 2005), pp. 553-576.
4. ISP Calculation "Hazard Analysis of Gas Pipeline for WCS CISF," WCS01-0211, Revision 0.

Impact:

SAR Sections 2.2, 2.8, 12.2.2, and 12.3 and Figure 2-3 have been revised and Figure 2-36 is added as described in the response.

2.2 Nearby Industrial, Transportation and Military Facilities

The only industrial facilities located within five miles of the WCS CISF boundary are URENCO USA, Permian Basin Materials, the Lea County landfill, a future travel stop and Sundance Services, Inc. (Figure 2-3). URENCO USA is a uranium enrichment facility that uses centrifuge technology to provide uranium enrichment services. Waste Control Specialists operates several permitted and licensed facilities immediately south of the WCS CISF, including a RCRA landfill, a low-level radioactive waste facility and a byproduct materials landfill.

Permian Basin Materials operates a quarry and crushing operation, wherein caliche, sand and gravel are mined, crushed and screened for commercial sales and used in making concrete (Permian, 2016[2-29]). Sundance Services, Inc. provides oilfield waste disposal services. Sundance Services is authorized by the New Mexico Energy, Minerals and Natural Resources Department to operate the waste oil treating plant, and also manages produced water, solids and drilling muds. Sundance Services is also authorized to landfarm solids (Sundance, 2016[2-30]).

The Lea County (New Mexico) Municipal Landfill is located to the southwest and across New Mexico Highway 234 from WCS CISF. This landfill disposes of municipal solid waste for the Lea County Solid Waste Authority under New Mexico Environmental Department Permit Number SW-98-08(P). The landfill services Lea County and its municipalities. The Lea County Municipal Landfill does not generate or receive hazardous waste (Lea, 2016[2-16]).

Construction has started on a travel stop operated by Love's Travel Stops & Country Stores located at the intersection of New Mexico State Highway 18 and Hwy 176. This facility, which will provide fuel for highway vehicles, is located more than 3.5 miles from the WCS CISF.

DD Landfarm, a non-hazardous oilfield waste disposal facility that closed in August 2013 and is undergoing decommissioning and post-closure monitoring, is located approximately 4 km (2.5 miles) west of the proposed WCS CISF.

There are no military facilities within a mile of the WCS CISF. The closest military facility is Cannon Air Force Base is the closest at a distance of approximately 135 miles.

The Texas & New Mexico Railway (TXN) is a railway consisting of 111 miles of track that generally run north-south between the Union Pacific lines in Monahans, Texas and its termination in Lovington, New Mexico. The railway is 4.8 miles from the WCS CISF at its closest point. The existing Waste Control Specialists railroad spur and loop exits the Texas & New Mexico Railway near Eunice, New Mexico as shown in Figure 2-3. This spur continues east until it reaches the existing Waste Control Specialists facility where it forms a loop around the facility. The rail side track to the WCS CISF will begin by connecting to the northwest side of the existing loop and terminate by re-connecting at the north side of the loop.

Texas State Highway 176 is a two-lane highway with 3.6 m (12 foot) wide driving lanes, 2.4 m (8 foot) wide shoulders and a 61m (200 foot) wide right-of-way easement on each side. Access to the site is directly off of Texas State Highway 176. Texas State Highway 176 is approximately 1.5 miles from the WCS CISF. New Mexico Highway 18 is a four-lane highway approximately 3.5 miles from the WCS CISF.

A natural gas pipeline owned by Energy Transfer LP runs parallel to Texas State Highway 176 within an easement on Waste Control Specialists property. The pipeline is approximately 7,700 feet from the WCS CISF at its closest point. Directly adjacent to and parallel to the Energy Transfer LP natural gas pipeline is an additional buried 14 inch diameter pipeline which is in idle status. The pipeline is also owned by Energy Transfer LP and it has been idle for over 15 years. Finally, a 10 inch diameter buried CO2 pipeline runs along the western and northern boundary of New Mexico Section 32. This pipeline is over 8,000 feet from the WCS CISF at its closest point.

In addition to industrial and transportation facilities, gas and oilfield operations are common in west Texas. Regionally, the WCS CISF is located in the Permian Basin of west Texas and southeast New Mexico which is one of the most important petroleum-producing regions in the United States, containing several thousand oil and gas wells [2-56]. Significant petroleum storage, however, is not located within 5 miles of the WCS CISF. Locally within the Waste Control Specialists property boundaries, oil and gas activity also is very limited. There is no active oilfield activity within the WCS CISF footprint area and only one documented dry hole in the immediate area of the WCS CISF (Figure 2-36). That dry hole has been cemented to the surface and proper plugging and abandonment protocol was observed. There is no evidence of any undocumented or "orphan" wells in the vicinity of the WCS CISF. If any open boreholes indicative of orphan wells are discovered during the construction process, these will be properly assessed and remediated using proper plugging and abandonment procedures in accordance with Texas Regulations. ISP joint venture member Waste Control Specialists also holds 100% of the Operating Rights for producing oil, gas, and other minerals for the area of land where the storage pads for Phase I and the future phases of the WCS CISF would be located. These rights allow ISP joint venture member Waste Control Specialists to prevent any drilling (horizontal or vertical) under storage pads for oil, gas, and other minerals. Based on Figure 2-36, 10 out of 12 locations (83%) are dry or no longer producing, which indicates there is little economically viable oil and gas resources within 1 mile of the WCS CISF and chances of petroleum recovery activities in this area are unlikely. As explained in SAR Section 2.6.2 and in the Probabilistic Seismic Hazard Analysis in Attachment D to SAR Chapter 2, it was determined there is a relatively low seismic hazard at the Waste Control Specialists site even with petroleum recovery activities.

SAR Chapter 12 Section 12.2 provides evaluations of the potential hazards these facilities present to the WCS CISF.

- 2-45 “FAA IFR Enroute Aeronautical Charts and Planning.” [Online]. Available: https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/ifr/. [Accessed: 12-Feb-2019].
- 2-46 “FAA AIS Open Data, MTR IR 128/180 Segment Location.” [Online]. Available: http://ais-faa.opendata.arcgis.com/datasets/0c6899de28af447c801231ed7ba7baa6_0/features/658. [Accessed: 12-Feb-2019].
- 2-47 “Air Route Traffic Control Centers (ARTCC).” [Online]. Available: https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/air_traffic_services/artcc/. [Accessed: 14-Feb-2019].
- 2-48 “GRC AirportIQ 5010 Airport Master Records and Reports.” [Online]. Available: <https://www.grc1.com/5010web/default.cfm>. [Accessed: 11-Feb-2019].
- 2-49 “Fact Sheet – Out Front on Airline Safety: Two Decades of Continuous Evolution.” [Online]. Available: https://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=22975&omniRss=fact_sheetsAoc&cid=103_F_S. [Accessed: 25-Feb-2019].
- 2-50 “Air transport, passengers carried | Data.” [Online]. Available: <https://data.worldbank.org/indicator/IS.AIR.PSGR?locations=US>. [Accessed: 25-Feb-2019].
- 2-51 Hawley, J.A., 1993. The Ogallala and Gatuna Formations in the Southeastern New Mexico Region, A Progress Report: New Mexico Geological Society Guidebook, 44th Field Conference, p. 261-269.
- 2-52 Waste Control Specialists LLC, Andrews, Texas, 2007. Application for License to Authorize Near Surface Land Disposal of Radioactive Waste. License R04100, Rev 12c.
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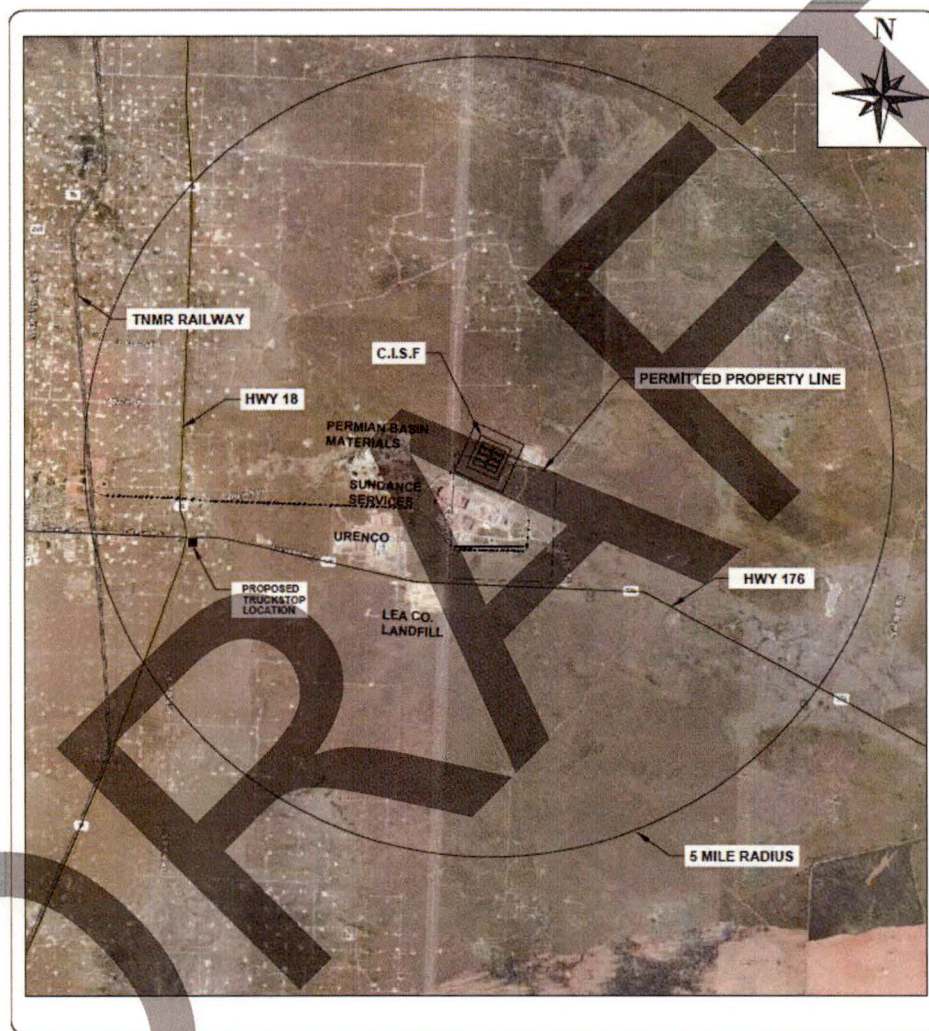


Figure 2-3
Proposed WCS CISF 5-mile Radius



Figure 2-36
CISF 1-Mile Radius Oil and Gas Activity

12.2.1.3 Analysis of Fire

It is conservatively assumed that the CTS fire is 2-meter from the transfer cask surface, with a heat flux of 29.3 kW/m² on the cask surface. A 3-D half symmetry finite element model is used to perform a transient analysis. The heat flux of 29.3 kW/m² is applied from bottom of the TFR to 1 meter from bottom, then decrease to zero at 2 meter from bottom. The source of the fire is considered to be 50 gallon of gasoline and the fire is sustained for 3.5 minutes. The transient analysis considered 3.5 min of fire and 30 min. post-fire.

The analysis results indicate that the TFR surface temperature increased 51C.

12.2.1.4 Corrective Actions

Immediately upon detection of the fire, appropriate actions would be taken by site personnel to extinguish the fire. The exterior surfaces of the cask should then be visually inspected for general deterioration (i.e. damaged concrete, loss of shielding, or surface discoloration that may indicate damage) could affect cask performance. This inspection will be the basis for the determination if any repair activities are necessary to maintain or return the cask to its design basis configuration.

12.2.1.5 Radiological Impact

There are no significant radiological consequences for this accident. There may be local spalling of concrete or reduction of neutron shield properties during the fire event, which could lead to some minor reduction in shielding effectiveness and an insignificant increase in radiation dose rates on the cask surface.

12.2.2 Offsite Accident Analysis

Section 2.2 "Nearby Industrial, Transportation and Military Facilities," indicates that there are no facilities that could contribute to the potential for significant explosions located within five miles of the CISF facility. There are no chemical processing facilities, petroleum refineries, natural gas facilities or munition depots that could contribute to the potential for significant explosions located within five miles of the CISF.

The neighboring facility to the west of the WCS CISF is a uranium enrichment facility, URENCO, and the distance is approximately 7,277 feet from the interior fence of the CISF to the closest building. The process used is a physical rather than a chemical process, and no chemical reactions are initiated although process hazards include possible chemical reactions in some accident scenarios. Some chemical reactions that may take place at URENCO are controlled by utility systems that decontaminate equipment and remove contaminants from effluent streams and lubricating oil [12-4]. Process Hazards identified by URENCO include radioactivity and toxicity of UF_6 release were found to be intermediate and high consequence. The potential accident sequences and consequences are discussed in greater detail in Section 3.7 of the Integrated Safety Analysis (ISA) Summary for the URENCO facility [12-4]. In the event of an accidental release URENCO has calculated the 2-hour and 8-hour Total Effective Dose Equivalent (TEDE) doses at the site boundary and they are 3.1 mSv (310 mRem) and 8.0 mSv (800 mRem), respectively; these doses include the prompt gamma radiation and the released cloud contributions under accident meteorology (5th percentile). Figure 3.7-1 of the URENCO ISA shows corresponding doses as a function of distance from the criticality site, and since the WCS CISF is over 2,000 meters from the URENCO facility, the results indicate that the consequences of a postulated criticality event upon members of the public at or beyond the site boundary would be considerably below the threshold for an intermediate consequence event, as defined by 10 CFR 70.61 [12-4].

Regulatory Guide 1.91, Evaluations of Explosions Postulated to Occur at Nearby Facilities and on Transportation Routes near Nuclear Power Plants, Revision 2, was used to determine distances from nearby facilities or transportation routes beyond which any explosion that might occur is not likely to have an adverse effect on WCS CISF SSCs important to safety. The guidance in Regulatory Guide 1.91 is based on limiting the overpressure at SSCs to less than 1 psi from any explosion. The magnitude of explosions involving solid or liquid materials is calculated by converting the weight of potentially explosive materials to their TNT equivalence. Per Regulatory Guide 1.91, a more detailed review of transporting explosive materials on these transportation routes would not be required beyond demonstrating that the overpressures at the WCS CISF can be shown not to exceed 1 psi for any explosion. Using the methodology of Regulatory Guide 1.91, the nearest truck transportation routes are located much further from the CISF than the distances to exceed 1 psi overpressure. Based on the Regulatory Guide, the maximum probable hazardous solid cargo for a single highway truck is 50,000 lb, and detonation of this quantity of explosives could produce a 1 psi overpressure at a distance of approximately 1,660 ft (0.31 mile) from the detonation. Since Texas Highway 176 is approximately 8,000 feet (1.5 miles) from the southernmost edge of the storage pad for the canisters, explosions involving vehicles travelling on this road would not produce significant overpressures at these locations.

The Texas & New Mexico Railway at its closest point, is approximately 4.8 miles from the west OCA boundary of the WCS CISF. Using the methodology of Regulatory Guide 1.91, the maximum probable hazardous solid cargo for a single box car is 132,000 lbs, and detonation of this quantity of explosive could produce a 1 psi overpressure at a distance of approximately 2,300 ft (0.44 mile) from the detonation which does not approach the location of the WCS CISF.

The Waste Control Specialists rail spur and loop exits the Texas & New Mexico Railway near Eunice, New Mexico as shown in updated Figure 2-3. This spur continues east until it reaches the existing Waste Control Specialists facility where it forms a loop around the facility. The rail side track to the WCS CISF will begin by connecting to the northwest side of the existing loop and terminate by re-connecting at the north side of the loop. This rail line is completely controlled by ISP joint venture member Waste Control Specialists and limited to approved Waste Control Specialists waste shipments and transport casks. Railcars carrying contents with the potential to adversely affect the CISF will not be permitted on the Waste Control Specialists rail spur and loop. Fire and explosion precautions for the WCS CISF rail side track are discussed in Section 3.3.6 of the SAR.

The effects of explosions on the storage systems are discussed in the SAR Appendices, Sections A.12.2.5, B.12.2.5, C.12.2.5, D.12.2.5, E.12.1.2, E.12.2.2, F.12.1.2 and G.12.1.2, and it is determined that the canisters are protected from the effects of explosions. Overpressures of substantially greater than 1 psi would be required to cause damage to the cask storage systems.

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 Waste Control Specialists 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.

Waste Control Specialists 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. A natural gas pipeline owned by Energy Transfer LP (previously owned by Sid Richardson Energy Services Company) runs parallel to Texas State Hwy 176 within an easement on Waste Control Specialists property. An evaluation assessing the hazards to the WCS CISF due to a pipeline leak and subsequent vapor cloud explosion following the guidance of Regulatory Guide 1.91 determined that the distance between the pipeline and the WCS CISF is sufficient to preclude any adverse impacts to the facility [12-7].

Directly adjacent to (within 30 feet) and parallel to the Energy Transfer LP natural gas pipeline is an additional buried 14 inch diameter pipeline which is in idle status. This pipeline is also owned by Energy Transfer LP and it has been idle since before 2004.

There is a 10 inch diameter buried CO₂ pipeline which runs along the western and southern boundary of New Mexico Section 32. This pipeline does not present a hazard to the WCS CISF based on the nature of the pipeline product and its distance from the WCS CISF which is more than 8,000 feet at its closest point.

Love's Travel Stops & Country Stores has started construction on a travel stop in New Mexico at the southeast corner of the intersection of New Mexico Highway 18 and Hwy 176. The Travel Stop will store up to 40,000 gallons of diesel fuel, 28,000 gallons of gasoline, and up to 12,000 gallons of non-flammable Diesel Exhaust Fluid (DEF) in underground tanks. Emergency Response Guide 128 [12-4] recommends a 0.5 mile safe distance for ignitable liquid tank fires which is much less than the 3.5 mile distance from the Travel Stop to the closest point at the WCS CISF boundary.

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].

For example, NUREG-1567, Section 6.5.1, "Decay Heat Removal Systems" describes "full blockage of ventilation passages" as a required thermal analysis for determining the performance of cask heat removal systems. Likewise, Section 15.5.2.8 of NUREG-1567, "Adiabatic Heatup," states that "the reviewer should verify that the configuration of the SSCs has been defined, (i.e., all inlets and outlets blocked (for casks) and cooling systems or pumps inoperable (for pools))."

12.3 References

- 12-1 NRC Regulatory Guide 3.48, "Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation or Monitored Retrievable Storage Installation (Dry Storage)," Rev. 1.
- 12-2 American National Standards Institute, American Nuclear Society, ANSI/ANS 57.9 1984, Design Criteria for an Independent Spent Fuel Storage Installation (Dry Storage Type).
- 12-3 Proposed SNM-1050, WCS Consolidated Interim Storage Facility Technical Specifications, Amendment 0.
- 12-4 Emergency Response Guide 128, Emergency Response Guidebook (2016), U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.
- 12-5 NUREG-1567, "Standard Review Plan for Spent Fuel Dry Storage Facilities," Revision 0, U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, March 2000.
- 12-6 NUREG-1536, "Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility," Revision 1, U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards, July 2010.
- 12-7 ISP Calculation "Hazard Analysis of Gas Pipeline for WCS CISF," WCS01-0211, Revision 0.

Consolidated Emergency Response Plan (CERP)**RAI EP-1:**

Clarify the approval authority for the proposed CERP.

The regulation in 10 CFR 72.44(f), states, in part: "A licensee shall follow and maintain in effect an emergency plan that is approved by the Commission." However, the transmittal letter dated March 16, 2017, states:

A Draft WCS Emergency Response Plan (ERP) is included as part of this revised application. WCS is required to seek agreement state approval for changes to the ERP, and therefore, only a draft version is provided until such time that NRC approves the content of the ERP and agreement state approval may be sought.

This information is necessary to determine compliance with 10 CFR 72.44(f).

Response to RAI EP-1:

The proposed CERP must be approved by both the NRC and Texas Commission on Environmental Quality (TCEQ) before it becomes effective. The CERP must be approved by the NRC to comply with the provisions in 10 CFR 72.44(f), which states, in part: "A licensee shall follow and maintain in effect an emergency plan that is approved by the Commission." The TCEQ must approve the proposed CERP because it is based on amending the current Emergency Response Plan (ERP) in place for the Storage, Processing and Disposal (SP&D) facilities at the Waste Control Specialists site that are licensed under TCEQ Radioactive Material License (RML) R04100.

The proposed consolidated CERP covers emergency response activities for both the WCS CISF and the existing Waste Control Specialists SP&D facilities. A consolidated plan is appropriate given that the WCS CISF and Waste Control Specialists SP&D facilities would share common resources and personnel, and are in close proximity. It also ensures the integration of planning/preparedness activities (e.g., development, coordination, drills, exercises, response and recovery planning activities) for all facilities and would help assure there is no confusion on the part of responders as to what to do in an emergency.

ISP is seeking approval of the revised consolidated CERP first by the NRC, with the intent of having TCEQ review the NRC's approval and any proposed revisions. The TCEQ review will be limited to considering the effects that the amended plan has on Waste Control Specialists SP&D facilities. Changes (if any) suggested by the TCEQ will be re-submitted to the NRC for a final review. The revised CERP will not become effective until it is approved by both the NRC and TCEQ.

The approval authority and process for amending the CERP once it has been initially approved by both the NRC and TCEQ are discussed in the response to RAI EP-16.

Impact:

No change as a result of this RAI.

RAI EP-2:

Identify any part of the CERP that does not apply to the 10 CFR 72.32(a) requirements for the CISF.

Section 3.1, "Classification System," of RG 3.67 states in part:

The licensee should clearly identify any part of the emergency plan does not apply to activities licensed by the NRC.

This information is necessary to determine compliance with 10 CFR 72.44(f).

Response to RAI EP-2:

ISP has revised the draft CERP to better differentiate the parts of the CERP that address NRC requirements (including those in 10 CFR 72.32(a)), TCEQ requirements, or both NRC and TCEQ requirements.

Items that apply specifically to either the CISF or the Waste Control Specialists CS SP&D Facilities are identified in Section Headings or in Table Titles. Items that do not reference the WCS CISF or the Waste Control Specialists SP&D Facilities specifically apply to both the WCS CISF and the Waste Control Specialists SP&D Facilities.

Impact:

The CERP throughout has been revised as described in the response.

RAI EP-3:

Provide the location where emergency response personnel will observe indications for fire and smoke alarms and for radiation monitoring instrumentation.

Section 2.2, "Detection of Accidents," of the proposed CERP states, in part:

Detection of accidents is dependent on personnel observation, by fire and smoke alarms, and radiation monitoring instrumentation.

The proposed CERP should state the specific location where personnel can observe indications of alarms and radiation monitoring instrumentation for the detection of an accident and to ensure accurate and timely emergency classification.

This information is necessary to determine compliance with the requirements of 10 CFR 72.32(a)(4).

Response to RAI EP-3:

The fire, smoke and radiation alarms and instrumentation for the CISF will be monitored from the central alarm panel located within the Central Alarm Station (CAS) in the Security and Administration Building. The CAS is manned 24/7. Alarms will sound both in the building where the detector is located and at the central alarm panel. Employees observing an alarm from outside the Security and Administration Building will notify Security, his/her supervisor and the Incident Commander (IC) immediately. The employee observing the alarm is also responsible for obtaining initial information to pass on to the IC or Security to facilitate accurate and timely emergency classification.

ISP has updated Section 2.2.2 of the draft CERP to reflect where the fire, smoke and radiation alarms and instrumentation will be monitored.

Impact:

CERP Section 2.2.2 has been revised as described in the response.

RAI EP-4:

Clarify the statements in Section 3.1, "Classifications of Accidents," of the proposed CERP, which refer to classification of accidents at the proposed CISF for both an Alert and Site Area Emergency declarations.

The provisions of 10 CFR 72.32(a)(3), "*Classification of accidents*," only require an "Alert" classification for accidents at an independent spent fuel storage installation (ISFSI), while 10 CFR 72.32(b)(3) requires a classification for accidents at a monitored retrievable storage facility as either an "alert" or "site area emergency."

Section 3.1, of the proposed CERP states, in part:

Emergencies are classified as an Alert or Site Area Emergency.

This information is necessary to determine compliance with 10 CFR 72.32(a)(3).

Response to RAI EP-4:

ISP has revised Section 3.1, including Tables A and B, of the draft CERP to clarify which classifications of accidents are specific to each facility (the existing Waste Control Specialists SP&D facilities or WCS CISF). Per 10 CFR 72.32(a)(3), the classification of accidents at the proposed WCS CISF includes only an Alert. The Site Area Emergency classification would only apply to accidents that fall under TCEQ requirements for accidents impacting the Waste Control Specialists SP&D Facilities.

Impact:

CERP Section 3.1, including Tables A and new Table B have been revised as described in the response.

RAI EP-5:

Clarify the statements in Table A, "Emergency Classification," of the proposed CERP, which refer to a response to an Alert classification at the proposed CISF.

The provisions of 10 CFR 72.32(a)(8) states, in part:

The licensee shall also commit to notify the NRC operations center immediately after notifications of the appropriate offsite response organizations and not later than one hour after the licensee declares an emergency.

Table A of the proposed CERP for response to a Site Area Emergency classification states, in part:

...Notify state and local agencies.

Notify the NRC Operations Center immediately after off-site notifications are made and no later than 1 hour after declaring a Site Area Emergency.

However, there is no statement regarding notification of the State and local agencies, as well as the NRC Operations Center for an Alert classification.

This information is necessary to determine compliance with 10 CFR 72.32(a)(8).

Response to RAI EP-5:

ISP has replaced Table A (Emergency Classification) in the draft CERP with Tables A (WCS SP&D Emergency Classification) and B (WCS CISF Emergency Classifications).

In the event of an Alert, Table B requires the IC to notify appropriate offsite response organizations, the NRC Operations Center and affected state and local agencies. Per 10 CFR 72.32(a)(8), Table B requires notification of the NRC Operations Center immediately after off-site response organizations are notified but no later than 1 hour after an Alert is declared.

NRC will be notified by the State of Texas, as an agreement state, in accordance with NUREG-0728 Revision 4 for events occurring at the WCS SP&D facilities.

Impact:

CERP Table A (with new Table B) has been revised as described in the response.

RAI EP-6:

Clarify the individual (designated emergency response organization (ERO) position) on site at all times (24-hour per day, 7 days per week) with the authority and responsibility to accurately and timely perform emergency classification, and notify offsite agencies and the NRC.

Section 4.4, "Incident Commander (IC)," of the proposed CERP states, in part:

The IC or alternate is on the facility premises or on call 24 hours a day (i.e., available to respond to an emergency by reaching the facility within less than one hour if after working hours). In the absence or unavailability of the primary IC, an alternate IC is designated as the primary IC under a delegation of authority memorandum.

Section 4.4.1, "Delegation and Assignment," of the proposed CERP states, in part:

These personnel may not always be present at the facility when an event occurs. One of the ICs listed in Attachment F, Emergency Information List of EP-1.1, Consolidated Emergency Response, is always on-call. If the on-call IC is not at the facility, then he / she is available to those individuals present at the facility through communication device or other means.

Section 5.1.3, "Initial Response and Notification," of the proposed CERP states, in part:

WCS Security Officers are trained to assume the duties of initial response and notification during these times. Upon detecting a perceived emergency, Security personnel on duty will immediately inform the IC.

This information is necessary to determine compliance with 10 CFR 72.32(a)(7).

Response to RAI EP-6:

The CERP in Section 4.4 designates the Incident Commander (IC) or alternate as the primary individuals with the authority and responsibility to accurately and timely perform emergency classification, and notify offsite agencies and the NRC. These individuals are on the facility premises or on call 24 hours a day.

In the event that the IC or alternate IC are not onsite and cannot be reached in 15 minutes, a trained employee that is verified to be on-site has the responsibility to perform emergency classification of an event and notify offsite agencies and the NRC. In most cases this will be security personnel (who are always onsite) specifically trained and qualified in classifying accidents and making required notifications. Security personnel will either be patrolling the site or be in the Security and Administration Building where fire, smoke and radiation alarms and instrumentation for the WCS CISF will be monitored from a central alarm panel (see response to RAI EP-3). The designated security person will be trained and have the authority to make emergency classifications provide notification to the NRC within one hour.

The CERP has been revised in Section 4.4.1 and 5.1.3 to designate an individual who can assume the authority and responsibility to perform emergency classifications, and notify offsite agencies and the NRC in the event that the IC or alternate ICs are not onsite and cannot be reached in 10 minutes. The revised CERP includes requirements that the individual performing this role be; 1) verified as being onsite when there is no IC present; 2) understands his role in making an emergency classification and notifying the NRC within one hour; 3) has received the proper training.

Impact:

CERP Sections 4.4.1 and 5.1.3 have been revised as described in the response.

DRAFT

RAI EP-7:

Clarify the NRC's responsibilities for detecting, measuring and supervising cleanup for a release of Agreement State licensed radioactive materials at the proposed CISF.

Section 4.11, "Coordination with Participating Government Agencies," of the proposed CERP states, in part:

*The DSHS [Department of State Health Services], TCEQ [Texas Commission on Environmental Quality] and **NRC** have responsibilities for detecting, measuring, and supervising cleanup of radioactive materials that are released into the environment.*

This information is necessary to determine compliance with 10 CFR 72.32(a)(7) and (8).

Response to RAI EP-7:

The NRC's roles and responsibilities for incident response and recovery are described in NUREG-0728, NRC Incident Response Plan, Revision 4, April 2005. The plan states in part:

"For incidents involving facilities and/or materials licensed by the NRC or an Agreement State, NRC is the Coordinating Agency under the Nuclear/Radiological Incident Annex. Accordingly, the NRC performs the specified Federal-level response functions, as appropriate and consistent with the agency's authorities and responsibilities, including (1) coordinating actions of Federal agencies related to the overall response; (2) coordinating Federal activities related to response and recovery of the radiological aspects of the incident; (3) coordinating security activities related to Federal response operations; (4) ensuring coordination of technical data (collection, analysis, storage, and dissemination); (5) ensuring Federal protective action recommendations are developed in a timely and effective manner and providing advice and assistance to State, local, and tribal governments for implementation; (6) coordinating release of Federal information to the public; (7) coordinating release of Federal information to Congress; (8) informing the White House on all aspects of the incident; and (9) ensuring coordination of demobilization of Federal assets. The designated cooperating agencies (e.g., DOE, EPA, USDA) provide assistance and support to the NRC."

As described above, NRC's roles and responsibilities for incident response and recovery (which includes cleanup) are essentially the same whether the accidental release of radioactive material originated in the Waste Control Specialists SP&D facilities or at the WCS CISF. NRC's primary role during the cleanup of radioactive materials released by either an Agreement State licensee or NRC licensee, would be coordinating Federal activities related to response and recovery of the radiological aspects of the incident.

The primary responsibility for dealing with an incident (and cleanup) originating at the Waste Control Specialists SP&D facilities remains with the licensee – Waste Control Specialists.

Under its response plan, NRC would provide advisory support and assist in diagnosing the situation, help isolate critical problems, and determine what courses of action and additional precautionary measures are necessary and appropriate. NRC would advise the licensee and, as applicable, State/local/tribal authorities and other Federal agencies.

Section 4.11 has been revised to clarify NRC roles and responsibilities in assisting WCS during incident response and recovery activities by adding the following text:

“In responding to a Site Emergency or Alert and subsequent recovery (i.e. cleanup of radioactive material releases), NRC would provide advisory support and assistance in diagnosing the situation, help isolate critical problems, and determine what courses of action and additional precautionary measures are necessary and appropriate, in accordance with the NRC Incident Response Plan (NUREG-0728, Revision 4).”

Impact:

CERP Section 4.11 has been revised as described in the response.

RAI EP-8:

Clarify what State (Texas and/or New Mexico) and local response organizations that are notified at the declaration of an Alert classification. Additionally, what is the timing of these notifications?

Section 4.10, "Activation of the ERP [Emergency Response Plan]," of the proposed CERP states, in part:

- *Activation for any reason is reported to the TCEQ Region 7...*
- *If an emergency is declared notify the DSHS emergency number...within one hour of contacting off-site response agencies...*

This information is necessary to determine compliance with 10 CFR 72.32(a)(8).

Response to RAI EP-8:

The IC or designee will begin notifying applicable local response organizations within 15 minutes and in no case more than an hour of an alert being declared at either the Waste Control Specialists SP&D Facilities or the WCS CISF. The purpose of the notifications is to inform the organizations that an Alert has been declared and not necessarily to request an immediate response. Local response organizations that would be notified include Andrews Police Department, Andrews County Sheriff, Eunice Fire and Rescue, Eunice Police Department, and Lea County Sheriff. Contact information for making these notifications will be updated on at least a semi-annual basis and will be posted in the security building and will be in the possession of the IC or designated alternate IC. (See response to RAI EP-6). Appropriate State organizations from Texas will be notified by telephone in approximately 15 minutes after an Alert is declared at either the Waste Control Specialists SP&D Facilities or the WCS CISF, and in no case later than 1 hour. Texas organizations notified include TCEQ Executive Director, TCEQ Region 7 and Department of State Health Services. New Mexico organizations notified include New Mexico Department of Homeland Security and Emergency Management and the New Mexico Department of Public Safety. Contact information for making these notifications will be updated on a semi-annual basis and will be posted in the security building and will be in the possession of the IC or designated alternate IC.

A list of State and local response organizations to be contacted when an Alert is declared is included in Attachment F of the flow down procedure EP-1.1 – Consolidated Emergency Response. The contact list is also referenced in Tables A and B in Section 3.1 and in Section 4.10.

References:

Regulatory Guide 3.67, Standard Format and Content Guide for Emergency Plans for Fuel Cycle and Materials Facilities, Revision 1, April 2011

Impact:

CERP Section 3.1, 4.10 and Table A and Table B have been revised as described in the response.

DRAFT

RAI EP-9:

Clarify how the source term is determined for a release from the proposed CJSF.

Section 5.2, "Accident Assessment," of the proposed CERP states, in part:

The WCS inventory program can provide a real time radiological source term. This inventory tracking program can provide immediate real time information on the radionuclides that are stored in the specific areas impacted by the incident/accident.

This information is necessary to determine compliance with 10 CFR 72.32(a)(6).

Response to RAI EP-9:

As stated in Section 11.1 of the SAR:

"In general, all of the canisters to be stored at the WCS CJSF are designed to be leak tight under all normal, off-normal, and accident conditions. Therefore, the confinement of the SNF or GTCC waste is maintained under all conditions. The only exceptions to this are the FO-, FC-, FF- Dry Shielded Canisters (DSCs or canisters) that were leak tested to a leakage rate of 10^{-5} std-cm³/sec. The confinement evaluation for these canisters is presented in Appendix A.11."

The contribution to the source term for release is zero for the leak tight canisters. Table A.11-6 provides the Isotope Specific Release Rates for FO-, FC-, FF-DSCs. The following Table based on Table A.11-6 has been added to Section 5.2 of the CERP, to clarify what the accident source terms are for the FO-, FC-, FF- Dry Shielded Canisters:

Accident Source Terms to be used for the FO-, FC-, FF-Dry Storage Canisters

Nuclide	Type	Accident (Ci/sec)
Cs-137	Volatile	4.055E-13
Ba-137m	Volatile	4.055E-13
Y-90	Volatile	2.614E-13
Sr-90	Volatile	2.614E-13
Pu-241	Fine	9.253E-13
Am-241	Fine	1.341E-13
Pu-238	Fine	9.737E-14
Cm-244	Fine	3.416E-14
Kr-85	Gas	1.576E-08
Pu-240	Fine	1.837E-14
Eu-154	Fine	1.598E-14
Pu-239	Fine	1.120E-14

Nuclide	Type	Accident (Ci/sec)
Ni-63	Fine	1.042E-14
Sm-151	Fine	1.010E-14
H-3	Gas	2.193E-09
Np-239	Fine	1.020E-15
Am-243	Fine	1.020E-15
Am-242m	Fine	9.161E-16
Am-242	Fine	9.122E-16
Cm-242	Fine	7.558E-16
Cm-243	Fine	6.053E-16
I-129	Gas	4.885E-13
Co-60	Crud	1.561E-12

Note: Accident source term based on a single canister.

Source: Table A.11.6 from Appendix A of the WCS Consolidated Interim Storage Facility Safety Analysis Report.

Impact:

CERP Section 5.2 has been revised as described in the response.

RAI EP-10:

Clarify if there are agreements in place or a memorandum of understanding with the New Mexico State Police.

Section 5.3.1, "Mitigation of Fires," of the proposed CERP states, in part:

In the event of a catastrophic fire, the Andrews and Lea County Sheriff's Departments, Texas Department of Public Safety and/or the New Mexico State Police are responsible for directing traffic along Highway 176 and evacuating any of the general public surrounding the facility that may be affected by windblown or gaseous wastes.

This information is necessary to determine compliance with 10 CFR 72.32(a)(8).

Response to RAI EP-10:

No MOUs or agreements are currently in place with the New Mexico State Police or the Texas Department of Public Safety. However, a catastrophic fire would cause ISP and Waste Control Specialists to call 911 (911 emergencies from ISP and Waste Control Specialists go to Andrews County Sheriff's Department and Lea County Sheriff's Department simultaneously) and to declare an Alert for the WCS CISF, or an Alert or Site Area Emergency for the Waste Control Specialists SP&D facilities. If needed, the New Mexico State Police and the Texas Department of Public Safety would be notified via local authorities responding to the fire.

Agreements are currently in place with the Andrews Police Department, the Andrews County Sheriff's Department and the Eunice Police Department for the Waste Control Specialists SP&D facilities. Under the current agreements, the Eunice Police Department, the Andrews Police Department and the Andrews County Sheriff's Departments are responsible for coordinating with Waste Control Specialists to establish law enforcement, traffic control and evacuation services (should they be needed at the Waste Control Specialists site) within their respective states. The Eunice Police Department may request assistance from the New Mexico State Police and the Andrews Police Department may request assistance from Texas Department of Public Safety as part of their efforts to coordinate traffic control and evacuation services.

Once the WCS CISF license application is approved, the Agreements with the Eunice Police Department, the Andrews Police Department and Andrew County Sheriff's Department will be amended to include the WCS CISF, and implemented after a 60-day comment period.

Section 5.3.1, "Mitigation of Fires," has been revised to read:

"In the event of a catastrophic fire, the Andrews Police Department and the Andrews County Sheriff's Department in Texas and the Eunice Police Department in New Mexico are responsible for directing traffic along Highway 176 and aiding the evacuation of any of the general public surrounding the facility that may be affected by windblown or gaseous wastes. These parties may request assistance from the Texas Department of Public Safety and/or the New Mexico State Police as needed."

Impact:

CERP Section 5.3.1 has been revised as described in the response.

DRAFT

RAI EP-11:

Clarify if there are agreements in place or a memorandum of understanding with the State of New Mexico for notification of the transportation of a contaminated person for treatment at a medical facility in New Mexico.

Section 5.3.5, "Mitigation of Injuries," of the proposed CERP states, in part:

The primary treatment facility for radiological contaminated individuals will be the Carlsbad Medical Center in Carlsbad, New Mexico....

This information is necessary to determine compliance with 10 CFR 72.32(a)(8).

Response to RAI EP-11:

There are currently no agreements or memorandum of understanding with the State of New Mexico for notification of the transportation of a contaminated person for treatment at a medical facility in New Mexico.

ISP has revised Section 5.3.5 of the CERP to require notification of the New Mexico Department of Homeland Security and Emergency Management when a contaminated person or persons are being routed to the Carlsbad Medical Center. ISP will also notify the Carlsbad Medical Center in a timely manner of incoming patients who may be contaminated. This will enable the medical center added time to call in any critical personnel and equipment that may be needed, and to make arrangements for isolating and decontaminating injured individuals.

Impact:

CERP Section 5.3.5 has been revised as described in the response.

RAI EP-12:

Clarify what recommended protective actions will be provided to off-site response organizations for the design-basis accidents at the CISF related to the ISFSI.

Section 5.4.5, "Off-site Protective Actions," of the proposed CERP states, in part:

After declaration of a Site Emergency, the IC has the authority to recommend off-site protective actions. The IC or designee will make off-site notifications to local authorities.

This information is necessary to determine compliance with 10 CFR 72.32(a)(9).

Response to RAI EP-12:

ISP has revised CERP Section 5.4.5 to clarify that protective actions are not needed for off-site response organizations for the design-basis accidents at the WCS CISF. In addition, ISP has revised CERP Section 3.1 to clarify that site area emergencies only apply to Waste Control Specialists SP&D facilities (see Table A in the revised CERP). The only emergency classification that applies to the WCS CISF is an Alert (see newly created Table B).

Section 3.6.4 of Interim Staff Guidance 16, Emergency Planning advises that protective action recommendations for dry cask storage should be consistent with the analysis results in NUREG-1140, A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Material Licensees, and the limits in EPA's Manual of Protective Action Guides. NUREG-1140 calculates the effective dose equivalent for the worst expected accident for dry cask and dry vault storage of spent fuel to be 0.003 rem at 100 meters for Stability Class F and 1 m/s wind speed and that the child's thyroid dose would be 0.005 to 0.04 rem within 100 meters. These doses are below the EPA's protective action guides for taking protective action after an accident. Therefore, offsite emergency preparedness and recommended protective actions are not necessary for design-basis accidents for spent fuel storage in dry casks.

References:

NRC Interim Staff Guidance 16, Emergency Planning, June 14, 2000

NUREG-1140, A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Material Licensees, August 1991

Manual of Protective Action Guides and Protective Actions for Nuclear accidents, U.S. Environmental Protection Agency, 1992

Impact:

CERP Sections 3.1 and 5.4.5 have been revised and new Table B has been added as described in the response.

RAI EP-13:

Revise the threshold limits in Section 5.5, "Exposure Control," and Table B, "Protective Action Guidance," of the proposed CERP to ensure consistency with the latest version of the U.S. Environmental Protection Agency (EPA) Protective Action Guide (PAG) Manual for early phase PAGs.

Section 5.5, "Exposure Control," of the proposed CERP states, in part:

The PAG threshold of concern for WSC is based on the EPA limits of less than one Rem Committed Effective Dose Equivalent (CEDE), five Rem thyroid, or 50 Rem skin dose at the site boundary.

Reference – "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," Office of Radiation Programs, USEPA, 1992

These limits are not consistent with those provided in either Table 2-1, "PAGs for the Early Phase of a Nuclear Incident," of the Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (EPA-400-R-92-001, May 1992) or in Table 1-1, "Summary Table for PAGs, Guidelines, and Planning Guidance for Radiological Incidents," of the PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents (EPA-400/R-17/001, January 2017).

This information is necessary to determine compliance with 10 CFR 72.32(a)(9).

Response to RAI EP-13:

ISP has revised the table in Section CERP Section 5.5 and designated the table as Table C to ensure consistency with the latest version of the U.S. Environmental Protection Agency's (EPA) Protective Action Guide (PAG) Manual for early phase PAGs. Specifically, the doses in REM in Table C were changed to match the values in the PAGs. The recommended actions listed in Table C are consistent with the PAG but are worded slightly different to more closely match the WCS facilities.

References:

Manual of Protective Action Guides and Protective Actions for Nuclear Accidents, U.S. Environmental Protection Agency, 1992

Impact:

CERP Section 5.5 and Table C have been revised as described in the response.

RAI EP-14:

Provide a basis for the size of the emergency planning zone (EPZ) with respect to the CISF, and clarify the definitions for chief elected officials in Section 5.9, "Emergency Planning Zone," of the proposed CERP.

Section 5.9 of the proposed CERP states, in part:

Based on the potential consequences of postulated emergencies, the EPZ for the WCS Facility has been defined as 6km [kilometer] (3.7 mile) radius circle centered on the Site.

Section 5.9 further states:

The size of the EPZ is sufficiently large that:

- Detailed planning within the EPZ provides both an adequate basis for responding to all reasonably credible accidents and a substantial base for the expansion of response efforts in the event that this proves necessary by WCS, State of Texas, local agencies and other organizations responsible for off-site emergency response.*
- Projected maximum doses resulting from credible accidents, under unfavorable meteorological conditions, within the site will not require protective actions to be taken outside the EPZ.*

Chief elected officials responsible for various portions of the WCS EPZ will provide the public information on operational emergencies at the WCS Facility and, based on inputs from the site and regulatory agencies, may recommend public protective actions, such as sheltering or evacuation."

The NRC staff needs additional information related to agreements or a memorandum of understanding with the State of New Mexico due to the proposed size of the EPZ includes several miles of the State of New Mexico, as well as an NRC-licensed fuel facility. The NRC staff also needs further clarification on the definition of "Chief elected officials," as referenced in Section 5.9.

This information is necessary to determine compliance with 10 CFR 72.32(a)(1) and 10 CFR 72.32(a)(9).

Response to RAI EP-14:

The Emergency Planning Zone at the Waste Control Specialists site was established based on potential incidents/accidents that could occur at the Waste Control Specialists SP&D Facilities. It is used to plan and implement emergency response actions resulting from those incidents/accidents. The WCS CISF could be impacted because it is located within the Waste Control Specialists SP&D Facilities EPZ. ISP has revised CERP Section 5.9 to clarify this.

The WCS CISF does not require the establishment of a separate EPZ because the Commission determined in NUREG-1140 that offsite emergency preparedness and recommended protective actions are not necessary for design-basis accidents for spent fuel storage in dry casks or dry vaults (See response to RAI EP-12). Thus, the EPZ established for the Waste Control Specialists SP&D Facilities is not used to plan and implement emergency response actions resulting from incidents/accidents originating at the WCS CISF.

Section 4.11 of the CERP discusses the Texas Chief Elected Officials. New Mexico notifications will go to New Mexico Department of Homeland Security and Emergency Management.

References:

NUREG-1140, A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Material Licensees, August 1991.

Impact:

CERP Section 5.9 has been revised as described in the response.

DRAFT

RAI EP-15:

Provide a description, by position or title, of the person responsible for developing, maintaining and updating the CERP.

Section 7.0, "Maintaining Emergency Preparedness Capability," of the proposed CERP does not include the identification of the personnel responsible for developing, maintaining, and updating the plan, as required in 10 CFR 72.32(a)(7).

This information is necessary to determine compliance with 10 CFR 72.32(a)(7).

Response to RAI EP-15:

ISP has revised CERP Section 7.1 to designate the primary Incident Commander as the individual responsible for developing, maintaining and updating the CERP. The primary Incident Commander also serves as the Vice President/Site General Manager.

Impact:

CERP Section 7.1 has been revised as described in the response.

RAI EP-16:

Clarify that the change process for the proposed CERP under the QA [Quality Assurance] Program will be evaluated in accordance with 10 CFR 72.44(f), and that maintenance and updating of the CERP will be consistent with the requirements of 10 CFR 72.32(a)(14).

Section 7.1, "Written Emergency Plan Procedures," of the proposed CERP states, in part:

Changes to ERP-100, Emergency Response Plan, and EP-1.1, Consolidated Emergency Response, are composed in accordance with QA-5.1, Standard Operating Procedures and Work Instructions.

This information is necessary to determine compliance with 10 CFR 72.44(f) and the requirements of 10 CFR 72.32(a)(14).

Response to RAI EP-16:

The change process for amending the Consolidated Emergency Response Plan will comply with the provisions of 10 CFR 72.44(f). ISP will review all proposed changes to the CERP that may affect the implementation of NRC requirements to determine whether the changes decrease the effectiveness of the CERP. In making this determination ISP will rely on the following guidance given in Regulatory Issue Summary 2005-02, Revision 1, Clarifying the Process for Making Emergency Response Plan Changes to determine the scope of its review and the criteria used to assess a decrease in effectiveness:

A decrease in effectiveness will occur if there is a decrease in the capabilities, resources or methods identified in the emergency plan, without actions or measures to compensate for the change, which results in a reduction in the licensee's capability for performing an emergency planning function. The overall impact of proposed changes on the effectiveness of the emergency plan, or its implementation, is to be determined, not just the effect that individual changes have on a specific part of the emergency plan.

If the changes do not decrease the effectiveness of the approved CERP, then ISP will make those changes and submit a report (in accordance with 10 CFR 72.4) describing the changes to the NRC within six months after a change is made. If the changes would decrease the effectiveness of the approved CERP, then ISP would not implement those changes until it has received prior NRC approval. Additionally, ISP will comply with 10 CFR 72.32(a)(14) to the extent it applies to future changes to portions of the CERP that address NRC requirements. ISP has incorporated the change control process from 10 CFR 72.44(f) and 10 CFR 72.32(a)(14) into Section 7.1 of the draft CERP.

Impact:

CERP Section 7.1 has been revised as described in the response.

RAI EP-17:

Clarify how the training of the staff at the Lea Regional Medical Center and Carlsbad Medical Center by the Waste Isolation Pilot Plant (WIPP) is verified and documented.

Section 7.2.3, "Off-Site Response Teams," of the proposed CERP states, in part:

Currently, the staff at the Lea Regional Medical Center in Hobbs, New Mexico and Carlsbad Medical Center in Carlsbad, New Mexico train with WIPP.

This information is necessary to determine compliance with 10 CFR 72.32(a)(10).

Response to RAI EP-17:

All emergency organizations, including the Lea Regional Medical Center and Carlsbad Medical Center, are offered participation opportunities to drill with WCS and tour the facility. Annually ISP will request written verification and documentation of the ERO drills that Lea Regional Medical Center and Carlsbad Medical Center have participated in with WIPP and any training obtained. The CERP Section 7.2.3 has been updated to reflect these commitments.

Impact:

CERP Section 7.2.3 has been revised as described in the response.

RAI EP-18:

Clarify or revise the frequency and scope of the emergency planning drills and exercises, as provided in Section 7.3 of the CERP.

Section 7.3, "Drills and Exercises," of the proposed CERP states, in part:

Emergency drills and exercises are conducted systematically....

[...]

Consistent with the requirements in 10 CFR 72.32 (a) and (b), documented quarterly communications checks with off-site response organizations will include the check and update of all necessary telephone numbers."

This information is not consistent with 10 CFR 72.32(a)(12), "Exercises," which states, in part:

[p]rovisions for conducting semiannual communications checks with offsite response organizations and biennial onsite exercises to test response to simulated emergencies. Radiological/Health Physics, Medical, and Fire drills shall be conducted annually.

Section 7.3 of the proposed CERP does not contain provision identified for radiological/health physics, medical, and fire drills to be conducted annually, or a requirement to conduct a biennial exercise. Additionally, communication checks are required semiannually, rather than quarterly as identified in Section 7.3.

This information is necessary to determine compliance with 10 CFR 72.32(a)(12).

Response to RAI EP-18:

The tables below list the points to be addressed from 10 CFR Part 72.32(a) (12) (i) and (II), respectively and indicate where each point is addressed in the updated WCS CERP.

10 CFR 72.32(a)(12)(i)	Location Addressed in CERP
Provisions for conducting semiannual communications checks with offsite response organizations	The 6 th paragraph of Section 7.3 is updated to add a reference to 10 CFR 72.32(a) to indicate that the quarterly communications checks with off-site response organizations currently in the plan are those used to fulfil the semiannual requirement in the regulation.
Provisions for conducting biennial onsite exercises to test response to simulated emergencies	The 5 th paragraph of Section 7.3 requires that the CERP be fully exercised twice per year. This would include testing responses to simulated emergencies.
Radiological/Health Physics, Medical, and Fire drills shall be conducted annually	The 5 th paragraph of Section 7.3 is updated to require Radiological/Health Physics, Medical and Fire drills be conducted annually at the CISF.

10 CFR 72.32(a)(12)(i)	Location Addressed in CERP
Semiannual communications checks with offsite response organizations must include the check and update of all necessary telephone numbers.	The 6 th paragraph of Section 7.3 requires updates to all necessary telephone numbers as part of the quarterly communications checks with off-site response organizations.
The licensee shall invite offsite response organizations to participate in the biennial exercise.	The 5 th paragraph of Section 7.3 states that off-site response organizations will be invited to participate in exercises that are required to be held twice per year.

10 CFR 72.32(a)(12)(ii)	Location Addressed in CERP
Participation of offsite response organizations in biennial exercises, although recommended, is not required.	The 5 th paragraph of Section 7.3 states that although participation by off-site organizations is recommended, it is not a requirement that they participate in order for the exercises to be conducted.
Exercises must use scenarios not known to most exercise participants.	The 5 th paragraph of Section 7.3 states that at least one unannounced site-wide drill will be conducted annually and that operational supervisors will not be notified in advance of the unannounced drills.
The licensee shall critique each exercise using individuals not having direct implementation responsibility for conducting the exercise.	The 5 th paragraph of Section 7.3 states that each drill and exercise will be critiqued using individuals that do not have direct implantation responsibility for the plan.
Critiques of exercises must evaluate the appropriateness of the plan, emergency procedures, facilities, equipment, training of personnel, and overall effectiveness of the response.	The 5 th paragraph of Section 7.3 states that critiques of the exercises will evaluate the appropriateness of the CERP, emergency procedures, facilities, equipment, training of personnel, and overall effectiveness of the incident response.
Deficiencies found by the critiques must be corrected.	The 5 th paragraph of Section 7.3 requires that any deficiencies found by the critiques be entered into the corrective action program for resolution.

Impact:

CERP Section 7.3 has been revised as described in the response.

RAI EP-19:

Justify why the most recent version of the NRC endorsed methodology for the development of emergency action levels (EALs) was not used in the development of the EALs for the WCS CERP specific to the CISF.

The guidance used by the industry for the development of EALs is the Nuclear Energy Institute (NEI) document, NEI 99-01 "Development of Emergency Action Levels for Non Passive Reactors," Revision 6, dated November 2012 (ADAMS Accession No. ML12326A805). Specifically, Section 1.3, "Independent Spent Fuel Storage Installation (ISFSI)," provides guidance on the development of EALs for an ISFSI.

This information is necessary to determine compliance with 10 CFR 72.32(a)(3).

Response to RAI EP-19:

A new Appendix D of the CERP "WCS CISF Facility Emergency Action Levels" has been added using NEI 99-01 "Development of Emergency Action Levels for Non Passive Reactors," Revision 6, dated November 2012 to develop EALs applicable to the WCS CISF. The revised section now references use of the NEI guidance.

References:

NEI 99-01 "Development of Emergency Action Levels for Non Passive Reactors," Revision 6, dated November 2012 (ADAMS Accession No. ML12326A805)

Impact:

CERP Appendix D (new) has been added as described in the response.

RAI EP-20:

Justify the Alert criteria and the dose thresholds used for the radiological plume incident in Appendix C, "Facility Emergency Action levels," of the proposed CERP.

Appendix C contains the following Alert criteria for a radiological plume incident:

>100 mrem CEDE but <500 mrem CEDE from an accidental release of radioactive material to the general public.

-----or-----

>1 rem CEDE in a Facility from an accidental release of radioactive material to Facility workers.

Additionally, Appendix C contains the following Site Area Emergency criteria for a radiological plume incident:

>500 mrem CEDE but <1 rem CEDE from an accidental release of radioactive material to the general public.

-----or-----

>1 rem CEDE, calculated at a facility boundary, from an accidental release of radioactive material to Facility workers.

These criterion are not consistent with the analysis for dry cask storage of spent fuel in NUREG-1140, "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees," dated January 1988, (ADAMS Accession No. ML062020791). Additionally, the Alert criteria is more representative of the typical thresholds for a Site Area Emergency classification. Please provide justification for the use of these radiation levels as thresholds for an Alert classification, or revise accordingly.

In addition, the use of a CEDE dose threshold is inconsistent with NRC-endorsed EAL guidance. Please provide a justification for using the CEDE dose, or revise accordingly consistent with the latest NRC-endorsed EAL guidance.

This information is necessary to determine compliance with 10 CFR 72.32(a)(3).

Response to RAI EP-20:

The information included in Appendix C of the earlier draft CERP was developed for the Waste Control Specialists SP&D Facilities and is not applicable to the WCS CISF. As explained in the response to RAI EP-19, the CERP has been revised using NEI 99-01 "Development of Emergency Action Levels for Non Passive Reactors," Revision 6, dated November 2012 to develop EALs specific to the WCS CISF. Appendix D, WCS CISF Facility Emergency Action Levels, has been added to the CERP to address those EALs. This revision assures that the CDDE dose threshold is consistent with both NEI 99-01 "Development of Emergency Action Levels for Non Passive Reactors," Revision 6, and NUREG-1140, "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees," dated January 1988.

Appendix C of the CERP has been revised to clarify that it applies only to the Waste Control Specialists SP&D Facilities and not the WCS CISF. Additionally, a new Appendix D, WCS CISF Facility Emergency Action Levels, has been added to the CERP.

References:

NUREG-1140, "A Regulatory Analysis on Emergency Preparedness for Fuel Cycle and Other Radioactive Material Licensees," dated January 1988

NEI 99-01 "Development of Emergency Action Levels for Non Passive Reactors," Revision 6, dated November 2012

Impact:

CERP Appendix C has been revised and a new Appendix D has been added as described in the response.