

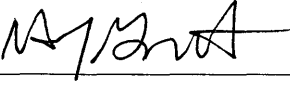
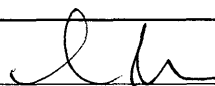
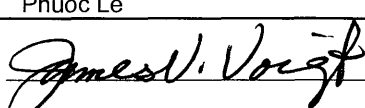
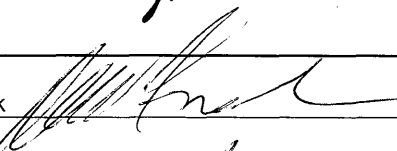
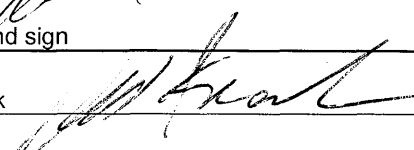
BSC

## Technical Report Administrative Change Notice

9. QA: QA

Page 1 of 6

Complete only applicable items.

<b>1. Document Number:</b> 000-30R-MGR0-03600-000-001	<b>2. Revision:</b> 001	<b>3. ACN Number:</b> 01
<b>4. Title:</b> Preclosure Procedural Safety Controls		
<b>5. Does this ACN supersede any other ACN?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<b>If Yes, ACN Number(s):</b>
<b>6. Approvals:</b>		
<b>Originator:</b>	Robert Garrett 	10/27/08
	Print name and sign	Date
<b>Checker:</b>		10/27/08
	Phuoc Le	Date
<b>QER:</b>		10-27-2008
	James Voigt	Date
<b>Lead or Supervisor:</b>	Michael Frank 	10-30-08
	Print name and sign	Date
<b>Responsible Manager:</b>	Michael Frank 	1/9/09
	Print name and sign	Date

7. Affected Pages:	8. Reason for, and Description of Change:
Page 8; Table 1, 6 <sup>th</sup> column; 4 <sup>th</sup> row (PSC-12)	Transcription error described in CR 12230. Change the Representative Event Sequence from "CRCF-ESD09-TAD (Seq. 3-3)" to "CRCF-ESD09-TAD (Seq. 2-3)".
Page 8; Table 1, 4 <sup>th</sup> and 5 <sup>th</sup> columns; 1st row (PSC-9)	Correct error described in CR 12250. Change the minimum boron concentration from "90 wt%" to "90 at%".
Page 10; Note (bottom of page)	In response to the change from the minimum boron concentration from "90 wt%" to "90 at%", update the "Note" to remove "wt% = weight-weight percentage" and add "at% = atom percent".
Page 10; Table 1, 6 <sup>th</sup> column; 4 <sup>th</sup> row (PSC-27)	Transcription error described in CR 12230. Change the Representative Event Sequence from "WHF-ESD01-CSNF (Seq. 3-5)" to "WHF-ESD05-CSNF (Seq. 5-5)".
Page 11; Table 2, 3rd column; 1st <sup>th</sup> row (Item 1), 2 <sup>nd</sup> bullet	Clarification described in CR 12230. Change this bullet to read as "Only one TEV containing a waste package (i.e., a "loaded TEV") is in transit at one time in the repository. However, the movement of an unloaded TEV at the surface is permitted concurrent with transit and emplacement operations of a TEV in the subsurface".
Page 11; Table 2, 2nd column; 1 <sup>st</sup> row (Item 1)	Clarification described in CR 12230. In the column titled "Facility/Operations Area", change the text from "Intra-Site, Subsurface, ST, TEV" to "Intra-Site, Subsurface".
Page 11; Table 2, 2nd column; 3rd row (Item 3)	Clarification described in CR 12230. In the column titled "Facility/Operations Area", change the text from "IHF, CRCF, RF, WHF, Intra-Site, Subsurface, ST, TEV, AO, STC" to "IHF, CRCF, RF, WHF, Intra-Site, Subsurface".

# Technical Report Administrative Change Notice

Complete only applicable items.

<b>1. Document Number:</b> 000-30R-MGR0-03600-000-001	<b>2. Revision:</b> 001	<b>3. ACN Number:</b> 01
<b>4. Title:</b> Preclosure Procedural Safety Controls		

<b>7. Affected Pages:</b>	<b>8. Reason for, and Description of Change:</b>
Page 11; Table 2, 2nd column; 4 <sup>th</sup> row (Item 4)	Clarification described in CR 12230. In the column titled "Facility/Operations Area", change the text from "Structure of CRCF, IHF, RF, WHF, Aging Pad, ST, TEV, AO, STC" to "IHF, CRCF, RF, WHF, Intra-Site, Subsurface".
Page 12; Table 2, 2nd column; 1st row (Item 5)	In the column titled "Facility/Operations Area", change the text from "Intra-Site, Subsurface" to "IHF, CRCF, RF, WHF, Intra-Site, Subsurface". Although this change was not explicitly identified in CR 12230, an examination of the Table 2 entries as part of the resolution of CR 12230 identified the need for this change. By completing this change, this requirement is consistent with the other requirements in this table after the incorporation of the changes identified in CR 12230.
Page 12; Table 2, 2nd column; 2nd row (Item 6)	Clarification described in CR 12230. In the column titled "Facility/Operations Area", change the text from "Structure of CRCF, IHF, RF, WHF, Aging Pad, ST, TEV, AO, STC" to "IHF, CRCF, RF, WHF, Intra-Site, Subsurface".

Item	Facility/ Operations Area	SSC	Procedural Safety Controls	Basis	Representative Event Sequence  (Sequence Number)	Reference
PSC-9	WHF	Spent fuel pool	With SNF in the pool, the concentration of soluble boron in the WHF pool and transportation cask/DPC fill water is maintained at a minimum of 2,500 mg/L, with the soluble boron enriched to a minimum of 90 at% in the <sup>10</sup> B isotope.	This control provides the appropriate initial conditions in the WHF pool to ensure that a critical configuration cannot be created in the pool. For wet operations, the minimum required concentration of 2,500 mg/L of soluble boron (enriched to 90 at% <sup>10</sup> B) in the WHF pool is sufficient to compensate for the complete omission of fixed neutron absorbers in the analyzed designs.	WHF-ESD21-CSNF (Seq. 2-3)	BSC 2008 (Ref. 8.1.11, Section 3); BSC 2008 (Ref. 8.1.10, Section 6.9.2).
PSC-10	IHF, CRCF, RF, WHF, Subsurface, Intra-Site	ITS SSCs	The amount of time that a waste form spends in each process area or in a given process operation, including total residence time in a facility, is periodically compared against the average exposure times used in the PCSA. Additionally, component failures per demand and component failures per time period are compared against the PCSA. Significant deviations will be analyzed for risk significance.	PCSA uses residence times and reliability data to calculate the probability of an initiating event. This control ensures that the average exposure times and reliability data are maintained consistent with those analyzed in the PCSA.	Applies to all event sequence and fault tree quantification that uses data from Att. C of the referenced analysis for each facility. Also applies to seismic PCSA analysis (Att. G of Ref. 8.1.14) and to fires analysis per Section 4.3 and Att. E of of the referenced analysis for each facility.	BSC 2008 (Ref. 8.1.14, Section 6.2.2.5); BSC 2008 (Ref. 8.1.2, Section 6.9.2); BSC 2008 (Ref. 8.1.4, Section 6.9.2); BSC 2008 (Ref. 8.1.8, Section 6.9.2); BSC 2008 (Ref. 8.1.10, Section 6.9.2); BSC 2008 (Ref. 8.1.6, Section 6.9.2); BSC 2008 (Ref. 8.1.9, Section 6.9.2).
PSC-11	IHF, CRCF, RF, WHF	Cask cranes	When transferring casks, the crane will remain connected to the cask until the proper seismic restraints are established.	The cask transfer trolley has built-in seismic restraints that prevent seismic interactions between the trolley frame and a cask. When so restrained, the cask is prevented from tipping by the cask transfer trolley design. During cask transfer, however, the crane must provide seismic stability until the cask transfer trolley seismic restraints are engaged.	No event sequences: potential cask tipover sequences due to seismic events are screened out (Section 6.2.2.5 of Ref. 8.1.14).	BSC 2008 (Ref. 8.1.14, Section 6.2.2.5)
PSC-12	IHF, CRCF, RF, WHF	Cask preparation platform	Transportation cask lid bolts are independently verified to have been removed prior to moving the cask from the cask preparation area to the unloading room or pool.	This control prevents the CTM from attempting to remove the cask lid with bolts still in place resulting in failure of the bolts and possible drop of the lid or cask.	CRCF-ESD09-TAD (Seq. 2-3) IHF-ESD07-HLW (Seq. 9-5) RF-ESD06-TAD (Seq. 3-3) WHF-ESD13-TAD (Seq. 2-3)	BSC 2008 (Ref. 8.1.2, Section 6.9.2); BSC 2008 (Ref. 8.1.4, Section 6.9.2); BSC 2008 (Ref. 8.1.8, Section 6.9.2); BSC 2008 (Ref. 8.1.10, Section 6.9.2).
PSC-13	IHF, CRCF, RF, WHF	CTM Port slide gates	At completion of a canister transfer operation, the port slide gates are verified to be closed	While the CTM is being used to perform transfer operations, the Operational Radiation Protection Program provides the necessary controls to ensure that workers are not present with the slide gates open. This control limits the probability of workers receiving a direct exposure by entering the transfer room with the CTM away from a port with a waste form present and the slide gate open.	CRCF-ESD18-TAD (Seq. 2) IHF-ESD-12A-NVL (Seq. 2) RF-ESD11 (Seq. 2) WHF-ESD29-TAD (Seq. 3)	BSC 2008 (Ref. 8.1.2, Section 6.9.2); BSC 2008 (Ref. 8.1.4, Section 6.9.2); BSC 2008 (Ref. 8.1.8, Section 6.9.2); BSC 2008 (Ref. 8.1.10, Section 6.9.2).
PSC-14	IHF, CRCF, RF, WHF	CTM	Prior to lifting or lowering a DPC, TAD canister, or naval canister, the CTM guide sleeve is to be verified to have been lowered.	This control limits the probability that a DPC, TAD canister, or naval canister is not in a vertical orientation during transfer such that any potential drops would be flat bottom drops.	CRCF-ESD09-TAD (Seq. 3-3) IHF-ESD-07-NVL (Seq. 4-5) RF-ESD06-TAD (Seq. 3-3) WHF-ESD13-TAD (Seq. 2-3)	BSC 2008 (Ref. 8.1.2, Section 6.9.2); BSC 2008 (Ref. 8.1.4, Section 6.9.2); BSC 2008 (Ref. 8.1.8, Section 6.9.2); BSC 2008 (Ref. 8.1.10, Section 6.9.2).
PSC-15	IHF, CRCF, RF, WHF, Intra-Site, Subsurface	Structure	Flights by fixed-wing aircraft in NTS or NTTR airspace within 4.9 NM (5.6 statute miles) of the North Portal and below 14,000 feet MSL are prohibited.	External event screening applied the results of the aircraft crash analysis, which assumes a flight restricted airspace around the North Portal.	No event sequences: initiating events screened out.	BSC 2008 (Ref. 8.1.3, Section 7).

Item	Facility/ Operations Area	SSC	Procedural Safety Controls	Basis	Representative Event Sequence  (Sequence Number)	Reference
PSC-24	IHF, CRCF, RF, WHF, Intra-Site, Subsurface	Cranes and handling equipment	When not in use, cranes, mobile platforms, and handling equipment are maintained in a location such that they cannot fall on a waste form.	The seismic analysis credits the exposure time of components over waste forms. This control ensures that the exposure time is limited to the time necessary to complete the waste handling operation.	Reduces the probability of potential 2-over-1 seismic interactions (Section 6.2.2.6 of referenced seismic PCSA).	BSC 2008 (Ref. 8.1.14, Section 6.10).
PSC-25	Subsurface	WP, emplacement drift	Rock condition is to be observed as emplacement drift boring is accomplished. Observed faults are to be specifically evaluated to ensure that conditions cannot credibly lead to a breach of the waste package during the preclosure period, or a standoff distance from the fault is to be established.	This control limits the potential for fault displacement (or related rockfall hazard) from a seismic event to induce a breach of the waste package at rest in an emplacement drift during the preclosure period.	For seismic PCSA, used to screen out potential fault displacement event sequences (Section 4.4.10, Ref. 8.1.14). SSO-ESD-03-SEQ-7-3	BSC 2008 (Ref. 8.1.14, Section 4.4.10); BSC 2008 (Ref. 8.1.9, Section 6.9.2).
PSC-26	CRCF	Cask Preparation Room equipment confinement doors	The Cask Preparation Room equipment confinement doors are to be closed when conducting operations with a potential for a drop involving a loaded cask.	This control ensures that the confinement boundary is intact when there is a potential for an event sequence that could result in radiological releases.	CRCF-ESD03-MCO (Seq. 2-6)	BSC 2008 (Ref. 8.1.2, Section 6.9.2).
PSC-27	WHF	Cask Preparation Room equipment confinement door	The Cask Preparation Room equipment confinement door is to be closed when waste handling operations are being conducted with a potential for a drop or collision involving a loaded cask or canister outside the WHF pool.	This control ensures that the confinement boundary is intact when there is a potential for an event sequence that could result in radiological releases outside the WHF pool.	WHF-ESD05-CSNF (Seq. 5-5)	BSC 2008 (Ref. 8.1.10, Section 6.9.2).

NOTE:  $\mu$  = (micro)  $10^{-6}$ ; AO = aging overpack; at% = atom percent; BWR = boiling water reactor; Ci = curie;  $\text{cm}^2$  = centimeter squared; CRCF = Canister Receipt and Closure Facility; CTM = canister transfer machine; CTT = cask transfer trolley; DHLW = defense high-level (radioactive) waste; DOE = U.S. Department of Energy; DPC = dual-purpose canister; GROA = geologic repository operations area; GWd/MTU = gigawatt day per metric ton of uranium; HEPA = high-efficiency particulate air (filter); HLW = high-level radioactive waste; HVAC = heating, ventilation, and air-conditioning; IE = initiating event; IHF = Initial Handling Facility; ITS = important to safety; J = joule; m = meter; LLWF = Low-Level Waste Facility; mg/L = milligrams per liter; mph = miles per hour; mi = mile; MSL = mean sea level; NM = nautical mile; NTS = Nevada Test Site; NTTR = Nevada Test and Training Range; PCSA = preclosure safety analysis; PSC = procedural safety control; PWR = pressurized water reactor; RF = Receipt Facility; SNF = spent nuclear fuel; SSC = structure, system, or component; ST = site transporter; STC = shielded transfer canister; TAD = transportation, aging, and disposal; TC = transportation cask; TEV = transportation and emplacement vehicle; WHF = Wet Handling Facility; WP = waste package; WPTT = waste package transfer trolley.

Source: Original

Table 2. Other Administrative or Management Controls That Support Preclosure Safety Analysis

Item	Facility/ Operations Area	Elements to be Addressed in Administrative or Management Control	Basis	Representative Event Sequence	Reference	Affected Support and Management System
1	Intra-Site, Subsurface	A traffic control program is established that includes the following elements: <ul style="list-style-type: none"> <li>Speed limits for vehicles other than waste-form transporters or conveyances that operate in the vicinity of routes used by waste-form transit</li> <li>Only one TEV containing a waste package (i.e., a "loaded TEV") is in transit at one time in the repository. However, the movement of an unloaded TEV at the surface is permitted concurrent with transit and emplacement operations of a TEV in the subsurface</li> <li>Closure of vehicular crossings over the TEV railway whenever a TEV is in transit on the surface to or from the subsurface</li> <li>In the subsurface drifts, traffic will be restricted from being in the same area as a loaded TEV. On the surface, all site roads crossing the path of a waste form transfer vehicle will be closed while a waste form is in transit.</li> </ul>	<ul style="list-style-type: none"> <li>To protect against energetic collisions or impacts on a waste form. A nuclear safety design basis restricts the operational speed of ITS waste form conveyances to 2.5 mph. This administrative program will provide an additional level of prevention.</li> <li>To reduce the potential for a TEV containing a WP colliding with another loaded or unloaded TEV by restricting the number of TEVs in operation at one time in the same vicinity.</li> <li>To reduce the potential for a loaded TEV collision with another vehicle stalled or otherwise halted at a rail crossing, inducing a derailment of the TEV.</li> </ul>	Other potential initiating events screened out.	BSC 2008 (Ref. 8.1.6, Section 6.0); BSC 2008 (Ref. 8.1.9, Sections 6.0 and 6.9.2).	Conduct of normal activities, including maintenance, surveillance, and periodic testing.  Training and certification of personnel.
2	IHF, CRCF, RF, WHF, Intra-Site, Subsurface	A fire protection program is established that includes the following elements: <ul style="list-style-type: none"> <li>Combustible material control</li> <li>Ignition source control</li> <li>Mobile firefighting service</li> <li>Requirements that fire barriers between designated fire zones, such as doorways, windows, and dampers, be in place during waste handling operations.</li> </ul>	<ul style="list-style-type: none"> <li>These requirements reduce the probability and intensity for a fire that could affect a waste form.</li> <li>Models of fire propagation and probability analyses account for presence of fire barriers between zones.</li> </ul>	Accounted for in fire analyses presented in Section 6.5 and Att. F of referenced analysis for each facility. (Ref. 8.1.9, Section 6.9.2)	BSC 2008(Ref. 8.1.2, Section 6.5 and Att. F); BSC 2008(Ref. 8.1.4, Section 6.5 and Att. F); BSC 2008(Ref. 8.1.8, Section 6.5 and Att. F); BSC 2008(Ref. 8.1.10, Section 6.5 and Att. F); BSC 2008 (Ref. 8.1.6, Section 6.5 and Att. F); BSC 2008 (Ref. 8.1.9, Sections 6.5, 6.9.2 and Att. F).	Conduct of normal activities, including maintenance, surveillance, and periodic testing.  Records, reports, tests and inspections  Training and certification of personnel.  Quality Assurance Program
3	IHF, CRCF, RF, WHF, Intra-Site, Subsurface	A maintenance program is established that includes the following elements: <ul style="list-style-type: none"> <li>Ensuring that the separation distance between combustible vegetation and the nearest structures containing radiological materials is maintained at 10 m (32.8 ft) or greater.</li> <li>Inspection and maintenance of water diversion channels and levees to protect against potential flooding of areas near the repository, including the North Portal pad and the aging pads.</li> <li>Inspection and maintenance of aging overpacks and horizontal aging modules to ensure ventilation ports are clear of debris.</li> </ul>	These administrative controls provide the bases for screening out external fire and external floods as initiating events.	No event sequences: initiating events screened out.	BSC 2008(Ref. 8.1.2, Section 6.5); BSC 2008(Ref. 8.1.4, Section 6.0); BSC 2008(Ref. 8.1.8, Section 6.0); BSC 2008 (Ref. 8.1.10, Section 6.0); BSC 2008 (Ref. 8.1.9, Section 6.0).	Conduct of normal activities, including maintenance, surveillance, and periodic testing. Records, reports, tests and inspections  Training and certification of personnel.  Quality Assurance Program
4	CRCF, IHF, RF, WHF, Intra-Site, Subsurface	Land usage within the repository withdrawal area is verified to exclude the following: <ul style="list-style-type: none"> <li>Liquid petroleum or natural gas pipelines</li> <li>Large explosive resources and/or sources of toxic or hazardous chemicals</li> <li>Roads used by shipments of hazardous material, other than those associated with repository operations, nearer than approximately 11 km (7 mi).</li> </ul>	These administrative controls provide the bases for screening out external man-made hazards as initiating events.	No event sequences: initiating events screened out.	BSC 2008 (Ref. 8.1.12, Section 6.12) BSC 2008 (Ref. 8.1.5, Section 6.3.3).	Configuration management system

Table 2. Other Administrative or Management Controls That Support Preclosure Safety Analysis (Continued)

Item	Facility/ Operations Area	Elements to be Addressed in Administrative or Management Control	Basis	Representative Event Sequence	Reference	Affected Support and Management System
5	CRCF, IHF, RF, WHF, Intra-Site, Subsurface	A radiation protection program is established that includes the following elements: <ul style="list-style-type: none"> <li>Workers are prevented from being in proximity to a TEV while the TEV contains a WP</li> <li>Control of access to emplacement drifts after a WP has been placed</li> <li>Control of access to waste handling operations areas when a waste form is present</li> <li>Verification of safe working environments, such as closure of shield doors or shield ports, by radiation technicians.</li> </ul>	<ul style="list-style-type: none"> <li>The first control is to reduce the probability of radiation exposure to a worker in proximity to the TEV during normal operations or in the event that a TEV system failure occurs during transit on the surface or in the subsurface.</li> <li>The second control is to reduce the probability of radiation exposure to a worker in proximity to an emplacement drift containing one or more WPs.</li> <li>The third and fourth controls provided to reduce the probability of radiation exposure to a worker during processing of a waste form container in a waste handling facility.</li> </ul>		BSC 2008 (Ref. 8.1.2, Section 6.9.2); BSC 2008 (Ref. 8.1.4, Section 6.9.2); BSC 2008 (Ref. 8.1.8, Section 6.9.2); BSC 2008 (Ref. 8.1.10, Section 6.9.2); BSC 2008 (Ref. 8.1.9, Section 6.9.2); BSC 2008 (Ref. 8.1.6, Section 6.9.2).	Operational radiation protection program Records, reports, tests and inspections Training and certification of personnel. Quality Assurance Program
6	CRCF, IHF, RF, WHF, Intra-Site, Subsurface	A construction control program is established that includes the following elements: <ul style="list-style-type: none"> <li>Control of the installation and configuration of the isolation barriers between emplacement drifts and subsurface construction areas such that development operations do not impact on emplacement operations.</li> <li>Control, storage, and use of explosives to ensure that there are no adverse effects on the structure of waste handling facilities, emplacement areas, or waste form conveyances. Timing of explosive blasts will be coordinated to not coincide with repository emplacement operations.</li> </ul>	These controls protect against construction hazards from adversely affecting ITS SSCs and potentially initiating an event sequence.	No event sequences: initiating events screened out.	BSC 2007 (Ref. 8.1.1)	Configuration management system
7	CRCF, IHF, RF, WHF, Intra-Site, Subsurface	Operating procedures are established that includes the following requirement: <ul style="list-style-type: none"> <li>When not in use, each non-ITS components (such as maintenance cranes) listed in the referenced analysis is verified to be secured in a location such that it cannot fall on or interfere with the safety function of an ITS SSC during waste handling operations.</li> </ul>	This control protects against non-ITS SSCs from adversely affecting ITS SSCs.	No event sequences: initiating events screened out.	BSC 2008 (Ref 8.1.16, Tables B-1 through G-1).	Conduct of normal activities, including maintenance, surveillance, and periodic testing Training and certification of personnel Quality Assurance Program

NOTE: AO = aging overpack; CRCF = Canister Receipt and Closure Facility; IHF = Initial Handling Facility; ITS = important to safety; PCSA = preclosure safety analysis; PSC = procedural safety control; PWR = pressurized water reactor; RF = Receipt Facility; SSC = structure, system, or component; ST = site transporter; STC = shielded transfer canister; TAD = transportation, aging, and disposal; TC = transportation cask; TEV = transportation and emplacement vehicle; WHF = Wet Handling Facility; WP = waste package.

Source: Original