

United States Government

Department of Energy

memorandumCarlsbad Field Office
Carlsbad, New Mexico 88221

DATE: June 19, 2008

REPLY TO
ATTN OF: CBFO:OSH:RF:MAG:08-1200:UFC:4700.00

SUBJECT: Request for Approval of Page Change 2008-002

TO: Dae Y. Chung, Deputy Assistant Secretary for Safety Management and Operations,
Office of Environmental Management

This letter transmits Page Change 2008-002 for your approval. The attached Safety Evaluation Report (SER) provides the basis for approval of Page Change 2008-002 that, upon Department of Energy (DOE) approval, amends the Waste Isolation Pilot Plant (WIPP) safety basis, as described below. Page Change 2008-002 (attached) is provided as an attachment to the SER.

Washington TRU Solutions (WTS) prepared draft Page Change 2008-002 to the WIPP Contact-Handled (CH) and Remote-Handled (RH) Documented Safety Analyses (DSAs) and Technical Safety Requirements (TSRs) to support revision of the CH and RH TSR Limiting Condition for Operation (LCO) 3.1.1. Page Change 2008-002 fulfills the commitment in the Justification for Continued Operation (JCO) NS-RP-2008-02, *Basis to Continue Normal Operations During Repair of the Washington TRU Solutions Fire Suppression System*, to revise the applicable TSRs based on the final Fire Suppression System (FSS) configuration. The JCO will terminate when the FSS is returned to operable status and revised CH and RH TSRs have been reviewed and approved by DOE, or by June 30, 2008, whichever comes first.

If you have any questions or comments regarding this matter, please contact Dr. Gary L. Scott at (575)234-7336.



David C. Moody
Manager

Attachments

cc: w/ attachments

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AUTHORITY APPROVAL

**Safety Evaluation Report
of the Waste Isolation Pilot Plant
*Contact Handled (CH) Waste Documented Safety Analysis (Revision 10),
Contact Handled (CH) Technical Safety Requirements (Revision 10),
Remote Handled (RH) Waste Documented Safety Analysis (Revision 0), and
Remote Handled (RH) Technical Safety Requirements (Revision 0)***

Page Change 2008-002

**U. S. Department of Energy
Carlsbad Field Office**

Date: June 2008

SIGNATURE ON FILE
Richard Farrell, CBFO Nuclear Safety Specialist


Date: June 19, 2008

SIGNATURE ON FILE
Dr. Gary Scott, CBFO AB Senior Technical Advisor

Date: June 19, 2008

SIGNATURE ON FILE
Dr. David C. Moody, CBFO Manager

Date: June 19, 2008

Approved: 
Dae Y. Chung, Deputy Assistant Secretary,
Safety Management and Operations,
Office of Environmental Management

Date: 6/23/08

memorandum

DATE: **JUN 23 2008**

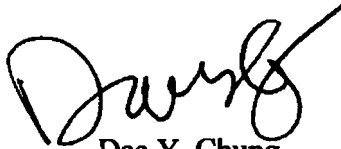
REPLY TO
ATTN OF: EM-60 (Chung, 202-586-5151)

SUBJECT: Request for Approval of Page Change 2008-002

TO: David Moody, Manager, Carlsbad Field Office

Based on my review of the *Safety Evaluation Report of the Waste Isolation Pilot Plant Contact Handled (CH) Waste Documented Safety Analysis (Revision 10)*, *Contact Handled (CH) Technical Safety Requirements (Revision 10)*, *Remote Handled (RH) Waste Documented Safety Analysis (Revision 0)*, and *Remote Handled (RH) Technical Safety Requirements (Revision 0) Page Changes 2008-002*, June 2008, I am approving the SER. There are no conditions of approval.

I have signed the attached SER for your records and transmittal to the contractor. If you have any further questions, please call me at (202) 586-5151.



Dae Y. Chung
Deputy Assistant Secretary for
Safety Management and Operations
Environmental Management

Attachment

1.0 INTRODUCTION

This Safety Evaluation Report (SER) addresses the collective changes within Page Change 2008-002 requests for page changes to WIPP/WIPP-95-2065, Revision 10, *WASTE ISOLATION PILOT PLANT CONTACT HANDLED (CH) WASTE DOCUMENTED SAFETY ANALYSIS*, Chapter 5; DOE/WIPP-95-2125, Revision 10, *WASTE ISOLATION PILOT PLANT CONTACT HANDLED (CH) TECHNICAL SAFETY REQUIREMENTS*, Revision 10, DOE/WIPP-06-3174, Revision 0; *WASTE ISOLATION PILOT PLANT REMOTE HANDLED (RH) WASTE DOCUMENTED SAFETY ANALYSIS*, Chapter 5; and DOE/WIPP-06-3178, Revision 0, *WASTE ISOLATION PILOT PLANT REMOTE HANDLED (RH) TECHNICAL SAFETY REQUIREMENTS*, as submitted in the Washington TRU Solutions, LLC (WTS) emails by Ms. Donna Busche, Chief Nuclear Engineer, to Dr. Gary Scott, Authorization Basis Senior Technical Advisor, U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO), on June 16, 2008 and June 17, 2008. This request results from the need to revise valve listings and textual content within the above mentioned documents to support revision of the CH and RH Technical Safety Requirement (TSR) Limiting Condition for Operation (LCO) 3.1.1. These page changes fulfill the commitment in the Justification for Continued Operation (JCO) NS-RP-2008-02, *Basis to Continue Normal Operations During Repair of the Washington TRU Solutions Fire Suppression System*, to revise the TSRs based on the final FSS configuration. The JCO will terminate when the Fire Suppression System (FSS) is returned to operable status and revised CH and RH TSRs have been reviewed and approved by DOE, or by June 30, 2008, whichever comes first. The time dependent need for approval of the page changes is to allow for continued TRU waste handling and emplacement operations at the Waste Isolation Pilot Plant (WIPP) Site beyond June 30, 2008 by using either a primary or an alternate set of isolations valves to provide for the previously analyzed and credited FSS performance while not violating the currently worded CH and RH TSRs.

The text changes to be incorporated in the CH and RH Documented Safety Analysis (DSA) Chapters 5 and the CH and RH TSR sections address several revisions affecting the ability to provide Waste Handling Building (WHB) and Support Building credited fire suppression system performance in the event of a small fire in the WHB within the areas served by three FSS risers and by the one FSS riser in the Support Building. WIPP FSS valves for both the normal and alternate fire water supply routes are identified, prior Post Isolation Valves (PIVs) that have been replaced by the current configuration have been eliminated, and the NFPA-code driven PIV monthly surveillance for the eliminated PIVs are also deleted.

The following page changes for the CH DSA, Revision 10, and the CH TSR, Revision 10, are attached to facilitate DOE's review and approval of all CH-related page changes:

- DOE/WIPP-95-2065, CH DSA, Revision 10, Chapter 5, page 5-4, Section 5.5.1.1 Safety Limits, Limiting Control Settings, and Limiting Conditions for Operations for Fire Water Supply and Fire Suppression for the WHB and Support Building LCO for operable FSS, statements made at the second and fourth bullets (a combination of single line-through deletions and simple word substitutions), and clarification of the third bullet on "Other

Isolation Valves" that must be locked open to identify the two valves located on the WHB mezzanine and in the waste hoist control room.

- DOE/WIPP-95-2065, CH DSA, Revision 10, Chapter 5, page 5-4, Section 5.5.1.2 Surveillance Requirements for Fire Water Supply and Fire Suppression for the WHB and Support Building for the Water Supply Pressure, Primary and Alternate Isolation Valves, Other Isolation Valves and Post Isolation Valves (a combination of single line-through deletions and simple word substitutions).
- CH TSR, Section 3/4-1, LCO 3.1.1 for Operable FSS in the WHB and Support Building, page 3/4-4, second and fourth bullets (a combination of single line-through deletion and simple word substitutions).
- CH TSR, Section 3/4-1, LCO 3.1.1, page 3/4-5, revised listing of the greater number of isolation valves identified for the primary and alternate water supply routes in the table for the CH Bay, OP&RR, RH Bay, and Support Building riser locations (a combination of new and currently listed valve identification numbers for each riser with the newly identified valves being underlined and text corrections).
- CH TSR, Section 3/4-1, LCO 3.1.1, Required Actions A.4 and B.3, page 3/4-6, restore operability within two weeks (single line-through deletions).
- CH TSR, Section 3/4-1, LCO 3.1.1, Surveillance Requirements, page 3/4-7, a Monthly Surveillance 4.1.1.2 (a combination of single line-through deletions and simple word substitutions) and 4.1.1.4 (a single line-through deletion).
- CH TSR, Section 3/4-1, LCO 3.1.2 Fire Water Supply System, page 3/4-8, identification of four isolation valves at the Building 456 Pump House listed as the new third bullet.
- CH TSR, Section 3/4-1, LCO 3.1.2, Surveillance Requirements, page 3/4-10, identification of the four isolation valves at the Building 456 Pump House for the Monthly Surveillance 4.1.2.2.
- CH TSR, Section B.3.1.1, page A-11, Application to Safety text (adding WHB).
- CH TSR, Section B.3.1.1, page A-11, LCO text in the second and fourth bullets (a combination of single line-through deletions and simple word substitutions) and the single deletion of the aforementioned SR and Bases for 4.1.1.4.
- CH TSR, Section B.3.1.1, page A-13, Action A.4 (a single line-through deletion).
- CH TSR, Section B.3.1.1, page A-14, Action B.3 (a single line-through deletion).
- CH TSR, Section B.3.1.1, page A-14, SR 4.1.1.2 (a combination of a combination of single line-through deletions and simple word substitutions and the mention of valves listed in Table 3.1.1-1 for valves required to be locked open).
- CH TSR, Section B.3.1.1, page A-15, SR 4.1.1.4 (a single line-through deletion).
- CH TSR, Section B.3.1.2, page A-17, LCO bases for the newly identified valve identifications at the Pump House listed as the new third bullet.

- CH TSR, Section B.3.1.2, page A-22, bases clarification of the Monthly Surveillance SR 4.1.2.2 of the four isolation valves at the Building 456 Pump House (was identified in the current CH TSR as at the base of the tank).

No additional new text or valve related control functions are proposed to be added to any CH DSA or TSR sections.

Likewise, the following page changes for the RH DSA, Revision 0, and the RH TSR, Revision 0 are attached to facilitate DOE's review and approval of all RH related page changes:

- DOE/WIPP-06-3174, RH DSA, Revision 0, Chapter 5, page 5-4, Section 5.5.1.1 Safety Limits, Limiting Control Settings, and Limiting Conditions for Operations for Fire Water Supply and Fire Suppression for the WHB for the LCO for an operable FSS, statements made at the second and fourth bullets (a combination of single line-through deletions and simple word substitutions), and clarification of the third bullet on "Other Isolation Valves" that must be locked open to identify the two valves located on the WHB mezzanine and in the waste hoist control room.
- DOE/WIPP-06-3174, RH DSA, Revision 0, Chapter 5, page 5-4, Section 5.5.1.2 Surveillance Requirements for Fire Water Supply and Fire Suppression for the WHB for the Water Supply Pressure, Primary and Alternate Isolation Valves, Other Isolation Valves and Post Isolation Valves (a combination of single line-through deletions and simple word substitutions).
- RH TSR, Section 3/4-1, LCO 3.1.1 for Operable FSS in the WHB, page 3/4-4, second and fourth bullets (a combination of single line-through deletions and simple word substitutions).
- RH TSR, Section 3/4-1, LCO 3.1.1, page 3/4-5, revised listing of the greater number of isolation valves identified for the primary and alternate water supply routes in the table for the CH Bay, OP&RR and RH Bay riser locations (a combination of new and currently listed valve identification numbers for each riser with the newly identified valves being underlined and text corrections).
- RH TSR, Section 3/4-1, LCO 3.1.1, Required Action A.4, page 3/4-6, restore operability within two weeks (a single line-through deletion).
- RH TSR, Section 3/4-1, LCO 3.1.1, Surveillance Requirements, page 3/4-6, a Monthly Surveillance 4.1.1.2 (a combination of single line-through deletions and simple word substitutions) and 4.1.1.4 (a single line-through deletion).
- RH TSR, Section 3/4-1, LCO 3.1.2 Fire Water Supply System, page 3/4-7, identification of four isolation valves at the Building 456 Pump House listed as the new third bullet.
- RH TSR, Section 3/4-1, LCO 3.1.2, Surveillance Requirements, page 3/4-8, identification of the four isolation valves at the Building 456 Pump House for the Monthly Surveillance 4.1.2.2.
- RH TSR, Section B.3.1.1, page A-11, Application to Safety text (adding in WHB).

- RH TSR, Section B.3.1.1, pages A-11 and A-12, LCO text in the second and fourth bullets (a combination of single line-through deletions and simple word substitutions) and the single deletion of the aforementioned SR and Bases for 4.1.1.4.
- RH TSR, Section B.3.1.1, page A-14, Action A.4 (a single line-through deletion).
- RH TSR, Section B.3.1.1, page A-14, SR 4.1.1.2 (a combination of a combination of single line-through deletions and simple word substitutions).
- RH TSR, Section B.3.1.1, page A-15, SR 4.1.1.4 (a single line-through deletion).
- RH TSR, Section B.3.1.2, page A-17, LCO bases for the newly identified valve identifications at the Pump House listed as the new third bullet.
- RH TSR, Section B.3.1.2, page A-21, bases clarification of the Monthly Surveillance 4.1.2.2 of the four isolation valves at the Building 456 Pump House (was identified in the current CH TSR as at the base of the tank.)

Similarly, no other new text or valve related controls are proposed to be added to any RH DSA or TSR sections.

2.0 REVIEW PROCESS

Incorporation of these changes is recommended to the Approval Authority based upon review of the specific changes and their supporting documentation by the CBFO staff, with assistance from the CBFO Technical Assistance Contractor (CTAC). This involved (1) verification of the technical accuracy, completeness, and defensibility of the proposed additions and revisions of the fire water distribution and fire suppression systems, (2) verifying that the TSR changes are consistent with the bases for the derivation of controls in Chapters 5 in both the CH DSA, Revision 10, and the RH DSA, Revision 0, (3) verifying all listed valves, including the newly listed supply valves across the WIPP Site were locked open at the time requested by CBFO, and (4) verifying test from the last set of NFPA code-complaint testing across the WIPP Site demonstrate fire water supply met or exceeded the FHA-prescribed minimum pressures and capacity.

This SER is prepared in accordance with the guidance provided in DOE-STD-1104-96, *Review and Approval of Nonreactor Nuclear Facility Safety Analysis Reports* (Change Notice 3). This review provides the Director, Deputy Assistant Secretary, Safety Management and Operations, DOE Office of Environmental Management (Approval Authority), with the basis for approval of these changes.

3.0 APPROVAL BASES

The page changes covered by this SER are required due to normally planned and sequenced project changes in the fire water supply to the WHB and the Support Building or that surfaced when the WIPP Site-wide fire water supply and WHB and Support Building FSS components were walked down for configuration management and LCO 3.1.1 and 3.1.2 implementation purposes. These walkdowns started at the fire water supply, included the fire pump house and all

exterior and all applicable interior valve locations. It is DOE's understanding that these newly listed valves were not subject to the same TSR SR procedure that verified that the isolation valves currently listed in the CH and RH TSRs are locked open. However, WTS does control the valves with locks via the Fire Protection Program as evidenced by their walkdown confirmation, and in addition, as stated in Section 2.0 of this SER, the DOE review team verified that all listed valves, including the newly listed isolation valves across the WIPP Site, were locked open at this time. Since WTS will be revising the LCO 3.1.1 and 3.1.2 SR procedures to implement the page changes, all TSR-required valves will be procedurally controlled.

As identified in Section 1.0 of this SER, the CH DSA, Revision 10, Chapter 5 changes and the corresponding CH TSR, Revision 10 proposed and necessary page changes as well as the RH DSA, Revision 0, Chapter 5 changes and the corresponding RH TSR, Revision 0, changes were made in all four safety basis documents. The changes impact those requirements necessary to positively provide CH and RH Chapters 3-credited fire suppression capabilities to the WHB and Support Building for the CH DSA and for the WHB for the RH DSA. The FSS provides protection by preventing small fires from becoming larger fires and negatively impacting TRU Waste.

To allow the facility change to be made, the CH and RH TSR-prescribed LCO 3.1.1 on PIVs and their associated Surveillance Requirements 4.1.1.4 would be eliminated. This change is editorial in nature since PIVs are included in the revised LCO 3.1.1 and their surveillances are included in the revised SR 4.1.1.2. Additional valves are identified which must be verified to be locked open when the fire water supply and fire suppression systems are deemed to be OPERABLE and thus provide the Chapter 3-credited fire protection to support continued TRU waste handling activities within the WHB.

Deletion of the Required Action to restore the FSS within two weeks is also proposed due to the age and condition of the underground fire water supply system and recent rupture and need for a Response Plan and JCO. DOE accepts this change since LCO 3.0.3 requires a MODE change or placing of the facility in a safe condition and submittal of a Response Plan to restore the FSS. This will assure that appropriate priority and funding is made available to restore the FSS to resume normal waste handling activities.

These similar CH and RH TSR requirement changes are necessary to be approved and implemented before June 30, 2008 in order to avoid a TSR violation associated with existing fire water supply valve positioning and new valve installation and substitution and the locking open of this combination of valves.

4.0 RESULTS

The review resulted in confirmation that the CH TSR, Revision 10, is accurate and complete, and is consistent with the CH DSA, Revision 10, as modified by Page Change 2008-002, and with the TSRs as modified and discussed above. The review also resulted in the confirmation that the RH TSR, Revision 0, is accurate and complete, and is consistent with the RH DSA, Revision 0,

Chapters 3, 4, and 5, with only Chapter 5 being modified by Page Change 2008-002, and with the RH TSRs as modified and discussed above.

It should be noted that changes to Chapter 4 Safety Structures, Systems, and Components of the CH and RH DSAs were not made at this time. Configuration changes to the FSS are not accurately described in Chapters 4 (e.g., the system description in Section 4.4.1.2 and functional requirements in Table 4.4-1), however, since the Chapters 5 derivation of the TSRs and the TSR LCO and Bases are adequate to support the page changes, the DOE expectation is that the updated descriptions of the FSS configuration will be made during the next Chapter 4 update for the merged CH and RH DSA that is currently being developed.

It is the judgment of the reviewers that the CH DSA, Revision 10 changes (Page Change 2008-002), the CH TRS, Revision 10 changes (Page Change 2008-002), the RH DSA Revision 0, changes (Page Change 2008-002), and the RH TSR Revision 0, change (Page Change 2008-002) meet the 10 CFR 830 Subpart B requirements and DOE Order 420.1 fire protection requirements and are consistent with associated DOE guidance, and that the implementation of these DSA and TSR changes are appropriate for the contractor to operate as established by the safety basis.

5.0 CONDITION OF APPROVAL

No conditions of approval are necessary for Page Change 2008-002 to the CH DSA and CH TSRs and the RH DSA and the RH TSRs.

6.0 CONCLUSIONS

Based on the reviewers' assessment of Page Change 2008-002 to Revision 10 of the CH DSA and CH TSRs, and to Revision 0 of the RH DSA and RH TSRs, and the evaluation of the Approval Authority, it is concluded that the page changes are consistent with the derivation of controls in the CH and RH Waste DSAs. Page Change 2008-002 to Revision 10 of the CH DSA and TSRs, and to Revision 0 of the RH DSA and RH TSRs, are thus approved.

Safety Evaluation Report Attachment
WTS Page Change 2008-002 Request Submittal

Fire Suppression System for the WHB

An LCO shall be required, along with the appropriate conditions for an operable fire suppression system, for the WH:

- The static pressure as measured at each riser to the WHB and Support Building shall be greater than or equal 125 pounds per square inch gauge (psig).
- The ~~main primary or alternate~~ isolation valves ~~at riser~~ shall be locked in the open position
- † • ~~All other s~~System isolation valves FW-411-V-072 and FW-411-V-073 shall be locked in the open position
- † • ~~The post indicator valve shall be locked in the open position~~
- Main drain test results are less than or equal to 20 percent pressure change
- Water flow indication when the inspector's test valve is opened

Fire Water Supply System

An LCO shall be required along with the appropriate conditions for an operable fire water supply system::

- The system shall maintain a water capacity of $\geq 135,000$ gallons
- The system shall have two operable fire pumps

5.5.1.2 Surveillance Requirements

Fire Suppression System

Water Supply Pressure

In order for the fire suppression system to operate properly, the static water supply pressure at the WHB supply risers must be greater than or equal to 125 psig. This SR verifies on a monthly basis that the water supply pressure is adequate.

Primary and Alternate ~~Main~~ Isolation Valves

The ~~main primary or alternate~~ isolation valves ~~for each riser is~~ are required to be locked open. This SR verifies that these valves are locked open on a monthly basis.

~~Other Isolation Valves~~

~~The other isolation valves in the system are required to be locked open. This SR verifies that these valve are locked open on a monthly basis.~~

~~Post Indicator Valves~~

~~The post indicator valve associated with each system is required to be locked open. This SR verifies that this valve is locked open on a monthly basis.~~

3/4.1 FIRE PROTECTION SYSTEM

LCO 3.1.1 Fire Suppression System for the Waste Handling Building

LCO: The fire suppression system for the WHB shall be OPERABLE. An OPERABLE fire suppression system consists of the following elements:

- The static pressure at each riser identified in Table 3.1.1-1 shall be greater than or equal to 125 psig (pounds per square inch gauge).
- The ~~primary or alternate main~~ isolation valves for each riser identified in Table 3.1.1-1 shall be locked in the open position.
- All other system isolation valves identified in Table 3.1.1-2 shall be locked in the open position.
- ~~The post indicator valve(s) (PIV) identified in Table 3.1.1-1 shall be locked in the open position.~~ DELETED
- Water flow indication when the inspector's test valve(s) (ITV) identified in Table 3.1.1-1 is opened.
- Main drain test results are less than or equal to 20% pressure change.

MODE Applicability: RH WASTE HANDLING and RH WASTE STORAGE

PROCESS AREA Applicability: RH BAY(RH WASTE HANDLING only), UPPER HOT CELL, FCLR, UNDERGROUND (when transporting RH WASTE on the waste shaft conveyance)

3/4.1 FIRE PROTECTION SYSTEM

LCO 3.1.1 Fire Suppression System for the Waste Handling Building (continued)

Table 3.1.1-1 Fire Suppression Component Riser and PIV Identification

Riser Location	Gauge Number	Primary Isolation Valve(s) and PIV Numbers	Alternate Isolation Valve(s) Numbers	ITV Number
CH BAY	411-PI-003-001	FW-Y-PIV-1 FW-Y-PIV-20 FW-Y-PIV-38 FW-Y-PIV-19 FW-411-V-001 FW-412-V-006	FW-Y-PIV-1 FW-Y-PIV-2 FW-Y-PIV-4 FW-Y-PIV-11 FW-Y-PIV-8 FW-411-V-079 FW-411-V-078 FW-411-V-001 FW-412-V-006	FW-411-V-023 FW-412-V-002
OP&RR	411-PI-003-003	FW-Y-PIV-1 FW-Y-PIV-2 FW-Y-PIV-4 FW-Y-PIV-11 FW-Y-PIV-8 FW-411-V-010	FW-Y-PIV-1 FW-Y-PIV-20 FW-Y-PIV-38 FW-Y-PIV-19 FW-411-V-078 FW-411-V-079 FW-411-V-010	FW-411-V-062
RH BAY	411-PI-003-005	FW-Y-PIV-1 FW-Y-PIV-20 FW-Y-PIV-38 FW-Y-PIV-18 FW-Y-PIV-17 FW-411-V-052	FW-Y-PIV-1 FW-Y-PIV-2 FW-Y-PIV-4 FW-Y-PIV-11 FW-Y-PIV-7 FW-Y-PIV-14 FW-Y-PIV-16 FW-Y-PIV-17 FW-411-V-052	FW-411-V-042 FW-411-V-044

Table 3.1.1-2 Isolation Valve Number and Location

Valve Number	Location Description
FW-411-V-072	Isolates the sprinkler piping in modular office 41-Z-052, located on WHB mezzanine.
FW-411-V-073	Isolates the sprinkler piping in the sound enclosure, located in the waste hoist control room.

3/4.1 FIRE PROTECTION SYSTEM

LCO 3.1.1 Fire Suppression System for the Waste Handling Building (continued)

-----NOTE-----

Separate entry is allowed for each INOPERABLE portion of the fire suppression system

ACTIONS

Condition	Required ACTION	Completion Time
A. The fire suppression system is determined to be INOPERABLE for the WHB	A.1 Remove any diesel powered equipment from the RH BAY.	IMMEDIATELY
	<u>AND</u>	
	A.2 Post a FIRE WATCH in the AFFECTED AREA(s)	IMMEDIATELY
	<u>AND</u>	
	A.3 Stop all RH WASTE HANDLING OPERATIONS in the RH BAY, the UPPER HOT CELL, the FCLR or the UNDERGROUND that involves use of the waste hoist.	48 hours
	<u>AND</u>	
	A.4 Restore OPERABILITY of the affected fire suppression system	2 weeks

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT	FREQUENCY
4.1.1.1 VERIFY the water supply static pressure as measured at each riser to the WHB identified in Table 3.1.1-1 is greater than or equal to 125 psig.	MONTHLY
4.1.1.2 VERIFY the <u>primary or alternate main</u> -isolation valves for each riser identified in Table 3.1.1-1 <u>are</u> is locked open.	MONTHLY
4.1.1.3 VERIFY that other isolation valves identified in Table 3.1.1-2 are locked open.	MONTHLY
4.1.1.4 VERIFY that the PIV(s) associated with each riser as identified in Table 3.1.1-1 is locked open. DELETED	MONTHLY
4.1.1.5 Open the ITV associated with each riser as identified in Table 3.1.1-1 and VERIFY water-flow through the associated system.	QUARTERLY
4.1.1.6 Perform a main drain test to VERIFY that the water supply pressure reduction is less than or equal to 20%.	ANNUALLY

3/4.1 FIRE PROTECTION SYSTEM

LCO 3.1.2 Fire Water Supply System

LCO: The fire water supply system shall be OPERABLE. An OPERABLE fire water supply system consists of the following elements:

- The system shall maintain a water capacity of $\geq 135,000$ gallons.
- The system shall have two OPERABLE fire pumps.
- The following isolation valves shall be opened: FW-456-V-001, FW-456-V-019, FW-456-V-020, and FW-456-V-003.

MODE Applicability: RH WASTE HANDLING and RH WASTE STORAGE

PROCESS AREA Applicability: RH BAY(RH WASTE HANDLING only), UPPER HOT CELL, UNDERGROUND (when transporting RH WASTE on the waste shaft conveyance)

ACTIONS

Condition	Required ACTION	Completion Time
A. Fire Water capacity is < 135,000 gallons	A.1 Remove any diesel powered equipment from the RH BAY.	IMMEDIATELY
	<u>AND</u>	
	A.2 Initiate actions to restore water volume to the required level.	IMMEDIATELY
	<u>AND</u>	
	A.3.1 Restore the water volume to the required level.	8 hours
	<u>OR</u>	
	A.3.2 Stop all RH WASTE HANDLING OPERATIONS in the WHB.	8 hours

3/4.1 FIRE PROTECTION SYSTEM

LCO 3.1.2 Fire Water Supply System (continued)

ACTIONS (continued)

Condition	Required ACTION	Completion Time
B. One Fire Pump is INOPERABLE	B.1.1 Stop all RH WASTE HANDLING OPERATIONS in the WHB. OR	1 week
	B.1.2 Restore OPERABILITY of the affected Fire Pump	1 week
C. Both Fire Pumps are INOPERABLE	C.1 Remove any diesel powered equipment from the RH BAY. AND	IMMEDIATELY
	C.2.1 Restore OPERABILITY of at least one Fire Pump	8 hours
	OR C.2.2 Stop all RH WASTE HANDLING OPERATIONS in the RH BAY	8 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE REQUIREMENT	FREQUENCY
4.1.2.1 VERIFY that there is > 135,000 gallons of water available to fight a fire within the Water Distribution System.	EACH SHIFT
4.1.2.2 VERIFY that the isolation valves <u>FW-456-V-001, FW-456-V-019, FW-456-V-020, and FW-456-V-003</u> are is open.	EACH SHIFT
4.1.2.3 VERIFY that there is > 125 gallons of diesel fuel maintained in the diesel Fire Pump fuel tank.	Each shift
4.1.2.4 Perform an Automatic Start test on the Fire Pumps to assure each pump can automatically start at the proper pressure parameter.	WEEKLY
4.1.2.5 VERIFY that each Fire Pump is capable of pumping output of ≥1500 gpm at ≥105 psi (pounds per square inch) net discharge.	ANNUALLY

Application
to Safety

LCO 3.1.1 ensures the OPERABILITY of the fire suppression system for the WHB. The fire suppression system for the WHB is credited preventing a small fire in the WHB from becoming a large fire that could cause damage to RH WASTE or a combination of RH and CH WASTE.^{5, 1}

RH WASTE is protected from fires when it is inside a CLOSED RH SHIPPING CASK or when RH waste containers are inside the hot cell complex where the thick concrete walls, floors, ceiling, shield valves, shield plugs, shield windows, and shield doors prevent propagation of a fire. The fires of concern include those that impact the waste hoist during transport of RH WASTE to the UNDERGROUND, fires in the crane maintenance room, fires in the hot cell operating gallery, and a fire in the RH BAY near the common RH/CH wall when CH WASTE is stored in the northeast corner of the CH BAY in the WHB that may result from use of diesel powered equipment in the RH BAY. A fire associated with the diesel powered trailer jockey or the transportation tractor, or any other diesel powered equipment in the RH BAY could potentially impact CH WASTE in addition to RH WASTE in a 10-160B shipping cask with the lid bolts loosened. A fire in the hot cell operating gallery could damage the UPPER HOT CELL lead glass shield windows resulting in a loss of shielding. A fire in the crane maintenance room could propagate to the UPPER HOT CELL. A fire could also originate in an area of the WHB and propagate into the RH portion of the WHB or the waste hoist tower. Sprinklers are installed in the RH BAY, the FCLR, the hot cell operating gallery, and the crane maintenance room. Therefore, the fire suppression system the in WHB is essential to preventing fires from spreading and impacting RH WASTE. In the FCLR, RH WASTE is further protected by the facility cask. In the TRANSFER CELL, RH WASTE is protected by the 72-B shipping cask or the shielded insert. In the CUR, RH WASTE is protected by the shipping cask. SPECIFIC ADMINISTRATIVE CONTROL 5.6.4 also requires:

- that the override port shield plugs in the service room, RH BAY, and hot cell operating gallery be installed except for when the override tools are in use.
- that the shield door to the crane maintenance room be kept normally closed and opened only for transferring the UPPER HOT CELL crane to and from the crane maintenance room when RH WASTE is present in the UPPER HOT CELL.
- RH waste drums are only removed from the 10-160B shipping cask in the CUR with the CUR shield door closed
- A 72-B RH waste canister is not removed from the 72-B shipping cask outside the TRANSFER CELL.

These controls further protect RH WASTE in areas that are not covered by sprinklers.

LCO

The WHB is protected by an automatic wet-pipe sprinkler system. The sprinkler system must be OPERABLE to respond to a fire. OPERABILITY of the sprinkler system consists of the following:

- The static pressure at each riser identified in Table 3.1.1-1 shall be greater than or equal to 125 psig.
- The primary or alternate main isolation valves ~~for each riser~~ identified in Table 3.1.1-1 shall be locked in the open position.

- All other system isolation valves identified in Table 3.1.1-2 shall be locked in the open position.
- ~~The post indicator valve(s) (PIV) identified in Table 3.1.1-1 shall be locked in the open position:~~
- Water flow indication when the inspector's test valve(s) (ITV) identified in Table 3.1.1-1 is opened.
- Main drain test results are less than or equal to 20% pressure change.

OPERABILITY is verified by performing periodic checks of system pressure, routine inspection of system components and testing to ensure system operation (see SRs and Bases for 4.1.1.1, 4.1.1.2, 4.1.1.3, ~~4.1.1.4~~, 4.1.1.5, and 4.1.1.6).

MODE
Applicability

The MODEs in which RH WASTE is susceptible to a fire in the above ground areas are RH WASTE HANDLING and RH WASTE STORAGE. These are the only two MODEs that allow the RH WASTE to be present outside of the shipping casks in the above ground areas. The shipping casks are designed to withstand a fire; therefore, these containers protect RH WASTE and minimizes the potential release. In addition, RH WASTE HANDLING is the only MODE in which RH waste canisters or drums can be physically handled. Refraining from handling the RH WASTE reduces the number of possible initiators for a fire and exposure of the RH WASTE to these initiators. RH WASTE drums in the UPPER HOT CELL are vulnerable during WASTE STORAGE when maintenance work on the UPPER HOT CELL crane is being performed in the crane maintenance room. A fire in the hot cell operating gallery could potentially damage the UPPER HOT CELL lead glass shield windows and result in a loss of shielding during RH WASTE HANDLING OPERATIONS or RH WASTE STORAGE in the UPPER HOT CELL. Therefore, this LCO is applicable during the RH WASTE HANDLING and RH WASTE STORAGE MODEs.

PROCESS AREA
Applicability

The fire suppression system for the WHB is credited with preventing the growth of a small-scale fire in the WHB. This LCO is applicable in the following PROCESS AREA under the specified conditions:

RH BAY (When RH WASTE is present in the RH BAY in a 10-160B shipping cask with the lid bolts loosened or when diesel powered equipment is used in the RH BAY.)

UNDERGROUND (During transport of RH WASTE using the waste hoist.)

UPPER HOT CELL

FCLR

ACTION A.4

The INOPERABLE portion of the fire suppression system for the WHB shall be restored to OPERABLE within 2 weeks. The successful completion of this ACTION limits the time that the WASTE is unprotected and susceptible to fire damage. The Completion Time of 2 weeks provides adequate time to complete maintenance activities to return the system to OPERABLE status. This time frame is acceptable based on the low probability of a fire event within this period and recognizes the reduction in risk provided by the suspension of RH WASTE HANDLING OPERATIONS and the implementation of a FIRE WATCH. The two-week period is expected to allow sufficient time to perform the needed repairs to the WHB fire suppression system.

SRs

SR 4.1.1.1

Adequate water supply pressure is required for the proper functioning of the WHB fire suppression system. VERIFICATION shall be made on a MONTHLY basis that the water supply pressure is greater than or equal to 125 psig at each sprinkler system. This pressure is considered to be adequate based on engineering judgment and past observations of tests that water is available to the waste hoist tower at this pressure. VERIFICATION consists of reading the specified gauges listed in Table 3.1.1-1 for each system.

The above instrument value is not supported by an instrument uncertainty measurement calculation. Instead, it is supported by engineering judgment and expected margins to accommodate instrument measurement uncertainty. This FREQUENCY is based upon the Exception Paragraph 2.2.4.2 of NFPA Standard 25, *Testing and Maintenance of Water Based Fire Protection Systems*.⁷ Failure to meet or perform this SR requires entry into Condition A.

The specified gauges, listed in Table 3.1.1-1 for each section of the WHB fire suppression system, are a sealed type gauge, calibrated to a specified accuracy from the manufacture, and, therefore, cannot be recalibrated. During the MONTHLY verification of the 125 psig, if a gauge is found to be INOPERABLE the system must be declared INOPERABLE, and Condition A entered.

SR 4.1.1.2

VERIFICATION shall be made MONTHLY that the primary or alternate main isolation valves ~~on each of risers~~ in the WHB fire suppression system as listed in Table 3.1.1-1 ~~are~~ is locked open. This SR ensures that ~~all~~ required primary or alternate main isolation valves for the Waste Handling Building sprinkler system is verified in the locked open position providing assurance that an unobstructed flow path exists and that water supply is available to the sprinklers. The MONTHLY FREQUENCY has been determined to be adequate based upon NFPA criteria, past experience, and engineering judgment. Failure to meet or perform this SR requires entry into Condition A.

- SR 4.1.1.3 VERIFICATION shall be made MONTHLY that the isolation valves listed in Table 3.1.1 2 within the WHB suppression system is locked open. This SR ensures that these valves are verified in the locked open position providing assurance that an unobstructed flow path exists and that water supply is available to the sprinklers. The MONTHLY FREQUENCY has been determined to be adequate based upon engineering judgment and NFPA FREQUENCY requirements for other such in-line valves. Failure to meet or perform this SR requires entry into Condition A.
- SR 4.1.1.4 ~~VERIFICATION shall be made MONTHLY that the PIV(s) for the WHB fire suppression system as listed in Table 3.1.1-1 is locked open. This SR ensures that all required PIVs for the WHB sprinkler system is verified in the locked open position providing assurance that an unobstructed flow path exists and that water supply is available to the sprinklers. The MONTHLY FREQUENCY has been determined to be adequate based upon NFPA criteria, past experience, and engineering judgment. Failure to meet or perform this SR requires entry into Condition A. DELETED~~
- SR 4.1.1.5 The ITV(s) shall be opened QUARTERLY for each riser in the Waste Handling Building sprinkler system listed in Table 3.1.1-1. The test is performed to ensure that the systems operate as expected. The QUARTERLY FREQUENCY meets the requirements of NFPA Standard 25.⁷ Failure to meet or perform this SR requires entry into Condition A.
- SR 4.1.1.6 A Main Drain Test shall be performed ANNUALLY on each WHB riser listed in Table 3.1.1-1 to demonstrate that riser supply pressure responds appropriately to indicate flow path obstructions when the main drain valve is cycled. This SR allows those normal pressure variations that occur when water flows through the main drain valve at the riser. A fully or partially closed valve or other obstruction in the supply piping will cause an abnormally large drop in full flow pressure of the main drain when opened and a slow return to normal static pressure when closed. Acceptable variation in pressure indicates that all valves in the flow path from fire main up to the riser are open and that no other obstructions in the piping leading up to the riser exist. The acceptable variation is a pressure drop of less than or equal to 20% pressure change. System pressure must return to normal operating pressure upon closure of the main drain valve. The ANNUALLY FREQUENCY meets the requirements of NFPA Standard 25.⁷ Failure to meet or perform this SR requires entry into Condition A.

To avoid an unprotected cross-connect with the domestic water/utility system, which uses the north water storage tank as its supply source, the fire water suction piping to the north water storage tank contains a spool piece, which is normally not installed. The spool piece is installed when it is necessary to use the water in the north tank as source of fire water.

Application
to Safety

LCO 3.1.2 ensures the OPERABILITY of the fire water supply system which is essential to the proper performance of the sprinkler systems in the individual facilities. Again, the event of concern is the large fire and the fire water supply system is required to provide water to prevent the propagation of small fires within the WHB.

LCO

The fire water supply system provides water to the fire suppression systems identified in LCO 3.1.1. In order for the fire suppression systems to operate properly, the fire water supply system must be OPERABLE. OPERABILITY of the fire water supply system consists of the following:

- The system shall maintain a water capacity of $\geq 135,000$ gallons.
- The system shall have two OPERABLE fire pumps.
- The following isolation valves shall be open: FW-456-V-001, FW-456-V-019, FW-456-V-020, and FW-456-V-003.

OPERABILITY is verified by performing periodic checks of the available water supply, routine inspection of system components, and testing to ensure system operation (see SRs and Bases for 4.1.2.1, 4.1.2.2, 4.1.2.3, 4.1.2.4, and 4.1.2.5).

MODE
Applicability

The MODEs in which RH WASTE is susceptible to a fire in the above ground areas are WASTE HANDLING and WASTE STORAGE. These are the only two MODEs that allow the RH WASTE to be present outside of the shipping casks in the above ground areas. The shipping casks are designed to withstand a fire; therefore, these containers protect RH WASTE and minimizes the potential release. In addition, RH WASTE HANDLING is the only MODE in which RH WASTE can be physically handled. Refraining from handling the RH WASTE also reduces the number of possible initiators for a fire and exposure of the RH WASTE to these initiators. RH WASTE drums in the UPPER HOT CELL are vulnerable during WASTE STORAGE when maintenance work on the UPPER HOT CELL crane is performed in the crane maintenance room. Therefore, this LCO is applicable during the RH WASTE HANDLING and RH WASTE STORAGE MODEs.

SRs

- SR 4.1.2.1 Adequate water supply is required for the proper functioning of the WHB fire suppression system. VERIFICATION shall be made prior to EACH SHIFT that there is greater than 135,000 gallons of water to fight fires within the fire water distribution system. The initial SR is measured at the 180,000 gallon capacity fire water tank. If the fire water tank is out of service for maintenance, the VERIFICATION is made at the domestic water tank.
- The prior to EACH SHIFT FREQUENCY is adequate based upon the fact that, with pump out of 1500 gpm, the 135,000 gallon level allows for a 1-1/2 hour fire fighting capacity.
- SR 4.1.2.2 VERIFICATION shall be made prior to EACH SHIFT that the isolation valves FW-456-V-001, FW-456-V-019, FW-456-V-020 and FW-456-V-003 ~~at the base of the fire water tank is~~ are locked open. This SR ensures that the main isolation valve for the fire water distribution system is verified in the locked open position providing assurance that an unobstructed flow path exists and that water supply is available to the sprinklers. The prior to EACH SHIFT FREQUENCY has been determined to be adequate based upon current practices and far exceeds the NFPA criteria for this type of SR. Failure to meet this SR requires entry into Condition A ~~because if the valve is closed it is the same as having an inadequate water supply.~~
- SR 4.1.2.3 VERIFICATION shall be made prior to EACH SHIFT that there is greater than 125 gallons of diesel fuel in the diesel fire pump fuel tank. Both the 125 gallon level and the FREQUENCY of prior to EACH SHIFT are based on current SR practices. The 125 gallons of is judged to be adequate due to the fact that it will fuel the diesel fire pump for a period beyond the required 4 hour time period to empty the 180,000-gallon fire water tank. The FREQUENCY of prior to EACH SHIFT is again judged to be adequate due to the infrequent number of times the diesel fire pump is required to be started from one shift to the next and there is also an electric fire pump that has the same capacity that is also maintained but is not under a formal surveillance program.
- Failure to meet this SR requires entry into Condition B.
- SR 4.1.2.4 Perform an automatic start test on the both the electric and the diesel fire pumps WEEKLY. This automatic start test is performed to assure that the diesel fire pump automatically starts when system pressure decreases to 110 ± 3 psig and the electric fire pump automatically starts when system pressure decreases to 120 ± 3 psig. The WEEKLY FREQUENCY has been determined to be adequate based upon NFPA criteria. Failure to meet or perform this SR requires entry into Condition B or C according to the number of pumps found to INOPERABLE at a time.
- SR 4.1.2.5 VERIFICATION shall be made ANNUALLY that the each fire pump is capable of pumping 1,500 gpm at 105 psi.