WP 05-WH1703

Revision 9

RH TRU Emplacement Machinery Disassembly

Technical Procedure

EFFECTIVE DATE: 01/28/11

Randy Britain
APPROVED FOR USE

CONTINUOUS USE PROCEDURE

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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
7	10/27/10	Added the associated JHA to the Precautions and Limitations section. Revised Step 1.6 to add a new requirement. Added a note prior to Step 7.3.
8	11/05/10	Revised the eighth bullet in the Precautions and Limitations Section and Step 4.4 to change the AFA Locking Mechanism from 45 seconds to 15 seconds. Updated Steps 1.1 and 1.2.4 from Verify to Ensure. Added Step 8.3 for instructions using the 20-ton forklift when removing the WTMA. Added Step 8.4 to return back to ASSY/DISASSY.
9	01/28/11	Added Warnings for PPE and Extending the TC and Retracting the TC. Added Note prior to Prerequisite Actions for performance of steps and not bypassing radiological sign offs. Deleted Steps 7.3 to 7.8. Added new Steps 7.3 to 7.18 for the FCTC,

INTRODUCTION [1, 2]

This procedure describes how to disassemble remote-handled transuranic (RH TRU) waste canister emplacement and retrieval equipment and how to prepare the Facility Cask (FC) for return to the surface.

Performance of this procedure generates the following record(s), as applicable. Any records generated are handled in accordance with departmental Records Inventory and Disposition Schedules.

- Attachment 1 - Disassembly Data Sheet

REFERENCES

BASELINE DOCUMENTS

- DOE Standard 1090-2007, *Hoisting and Rigging*
- WTSD-TME-044, Horizontal Emplacement and Retrieval Equipment Operation and Maintenance Manual
- DOE/WIPP07-3372, *Waste Isolation Pilot Plant Documented Safety Analysis*
- DOE/WIPP-07-3373, *Waste Isolation Pilot Plant Technical Safety Requirements*
- WP 08-PT.03, WIPP Quality Assurance Program Plan for Type "B" Packaging
- WP 13-1, Washington TRU Solutions Quality Assurance Program Description

REFERENCED DOCUMENTS

- WP 05-WH1601, 20-Ton Diesel Forklift 52-H-125
- WP 05-WH1602, 41-Ton Diesel Forklift 52-H-005A
- WP 05-WH1708, RH Training Canister and Shield Plug Retrieval
- WP 05-WH1711, 6-Ton Toyota Forklift 52-H-007C
- WP 05-WH4401, Waste Handling Operator Event Response
- WP 12-HP1100, Radiological Surveys
- WP 12-HP1500, Radiological Posting and Access Control

- WP 12-HP4000, Emergency Radiological Control Responses

EQUIPMENT

- 6-ton forklift
- 20-ton forklift
- 41-ton forklift

PRECAUTIONS AND LIMITATIONS

- Only personnel qualified as a Waste Handling Technician/Engineer (WHT/WHE), or trainees operating under the direct supervision of a qualified WHT/WHE, are authorized to perform the waste handling (WH) activities specified in this procedure.
- Only personnel who are familiar with the current version of JHA PROD-42, Horizontal Emplacement and Retrieval Equipment (HERE), may perform this procedure.
- The size, weight, and powered operation of the HERE dictate that special care be taken to prevent injury to personnel during its setup/disassembly and operation.
- Spotters are required to assist the forklift drivers in maneuvering the Alignment Fixture Assembly (AFA) and the Waste Transfer Machine Assembly (WTMA) into place using standard forklift hand signals.
- Once the Control Console (CC) is set up and power is available, the CC will not be left unattended with the CC POWER switch turned **ON**.
- Abnormal events that require cessation of this procedure, such as a radiological event, are to be performed in accordance with WP 05-WH4401 and WP 12-HP4000.
- If this procedure cannot be performed as written or in sequence, WHE shall be contacted.
- The AFA and the Transfer Carriage (TC) locking mechanisms switches must be held for at least 15 seconds to ensure full rotation of all locking mechanisms.
- If required, the operator may adjust the hydraulic jacks as needed to maintain proper tilt array status.
- Safety glasses, a long sleeve 100% cotton shirt, and leather gloves must be worn when opening and closing breakers.

- Any step that results in N/A on Attachment 1 must be initialed by person performing steps.
- While extending or retracting the STAGING PLATFORM (SP) or the TC on the HERE, the operators must be alert to prevent personnel from being caught between the moving parts.
- Performers of this procedure may print, sign, initial, and date on Attachment 1 at any time during the performance of this procedure.
- No non-waste handling vehicles are allowed in the active disposal room during WH operations.
- A spotter is required when diesel-powered vehicles are operating within approximately 100 feet of the contact-handled (CH) waste face.
- A spotter is required when operating the 41-ton forklift loaded with the FC.
- A spotter is required when operating any diesel-powered equipment within 100 feet of the HERE/FC aligned on a borehole.
- A shield plug shall be installed in a RH disposal borehole containing a RH waste canister prior to removal of the FC from the HERE.

NOTE

Prerequisite Actions must be performed, but may be performed in any order and in parallel as long as radiological sign-offs are not bypassed.

PREREQUISITE ACTIONS

1.0 Ensure preoperational inspections are completed on the following:

- 6-ton forklift
- 20-ton forklift
- 41-ton forklift

2.0 Ensure the following:

- Fire suppression system is intact.
- Fire suppression system control module system status lights are functioning properly and that no trouble lights are illuminated on the equipment.
- Visually verify the automatic/manual fire suppression system has not discharged.

3.0 WH, enter borehole information (panel, room, and borehole number) on Attachment 1.

SIGN-OFF WH

PERFORMANCE

NOTE

If performance of this procedure is after a retrieval process utilized for training purposes, it is not necessary to perform Sections 1.0 through 8.0.

NOTE

RH WHE may authorize performing steps out of order, in order to ensure proper indications are received, as necessary. Steps may also be repeated at the direction of the WHE, as long as radiological control steps are not bypassed. Any step or steps performed at the discretion of the WHE will be documented in the Waste Handling Log narrative.

1.0 RETRACTION OF TRANSFER CARRIAGE

WARNING

Proper Personal Protective Equipment (PPE), including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

1.1 Ensure the Main Circuit Breaker (M-CB) actuator on the outside of the Motor Control Center (MCC) is in the **ON** position.

1.2 Ensure the following CC settings:

1.2.1 POWER key switch is **ON**.

1.2.2 MODE SELECT SW1 is in **OPERATE**.

1.2.3 MODE SELECT SW2 is in **EMPLACE**.

1.2.4 TILT STATUS ARRAYs show only green on the light-emitting diodes (LEDs).

1.2.5 STAGING PLATFORM EXTEND LIMIT LED is **ON**.

1.2.6 GRAPPLE OPEN LED is **ON**.

1.2.7 CASK REAR SHIELD VALVE (RSV) and FRONT SHIELD VALVE (FSV) CLOSE LEDs are **ON**.

1.2.8 CASK RSV and FSV LOCKING PINS CLOSE LEDs are **ON**.

1.2.9 Remove the C-clamps from the SP and TC.

1.3 Place TRANSFER CARRIAGE PUMP switch to **ON**.

1.4 Verify the TC locking mechanisms are in the **LOCK** position.

WARNING

When retracting TC on HERE, operators must be alert to prevent personnel from being caught between moving parts.

1.5 Place the TRANSFER CARRIAGE switch to **RETRACT**.

1.6 When the TC automatically stops or is within approximately 2" of the rib, place the TRANSFER CARRIAGE switch to **OFF**.

1.7 Place the TRANSFER CARRIAGE PUMP to **OFF**.

1.8 Place all switches on CC in the **OFF** position.

2.0 REMOVAL OF SHIELD PLUG CARRIAGE

2.1 **IF** the Shield Plug Carriage (SPC) is on the SP,
THEN perform the following steps:

2.1.1 Center the SPC between the FC and TC.

CAUTION

The clearance for the top of the linear bearing rails for the TC is small. To prevent damage to the bearing rails, operator must exercise care to prevent dragging the forks across the rails.

2.1.2 With the 6-ton forklift, lift the SPC straight up over the rails and back the forklift out.

2.1.3 Transport the SPC to the shield plug storage area.

3.0 EXTENSION OF TRANSFER CARRIAGE

3.1 Place POWER key switch on the CC to **ON**.

3.2 Place the TRANSFER CARRIAGE PUMP to **ON**.

3.3 Place the MODE SELECT SW1 to **ASSY/DISASSY**.

3.4 Place the TRANSFER CARRIAGE LOCKING MECHANISM switch to UNLOCK until locking mechanism is in the **UNLOCK** position.

3.5 Verify the locking mechanisms are unlocked.

3.6 Place MODE SELECT SW1 to **OPERATE**.

3.7 Place MODE SELECT SW2 to EMPLACE.

WARNING

When extending TC on HERE, operators must be alert to prevent personnel from being caught between moving parts.

3.8 Place the TRANSFER CARRIAGE switch to **EXTEND**.

3.9 When the TC is flush with the back of the SP, return the TRANSFER CARRIAGE switch to **OFF**.

3.10 Place the TRANSFER CARRIAGE PUMP to **OFF.**

4.0 RETRACTION OF STAGING PLATFORM

4.1 Verify MODE SELECT SW1 is in **ASSY/DISASSY**.

4.2 Rotate MODE SELECT SW2 to **OFF**.

4.3 Place ALIGNMENT FIXTURE PUMP switch to **ON**.

4.4 Place the AFA LOCKING MECHANISM switch to UNLOCK, hold for at least 15 seconds, then release.

4.5 Place the AFA PUMP switch to **OFF**.

WARNING

When retracting SP on HERE, operators must be alert to prevent personnel from being caught between moving parts.

4.6 Place the STAGING PLATFORM switch to **RETRACT**.

4.7 When the RETRACT LIMIT LED comes **ON** and the SP automatically stops, place the STAGING PLATFORM switch to **OFF**.

NOTE

If dose rate at Step 5.1 is less than 5/mR/hr at 30 cm then Section 14.0 is not applicable.

5.0 PERFORMING DOSE RATE SURVEYS

5.1 Radiological Control (Radcon) Technician (RCT), perform dose rate survey of the Shield Collar and accessible areas of shield plug, per WP 12-HP1100.

5.2 RCT, record the survey number, survey date, and survey results on Attachment 1.

SIGN-OFF RCT

5.3 **IF** dose rate is ≥ 5/mR/hr at 30 cm,
THEN control in accordance to WP 12-HP1500.

6.0 DISCONNECTING FC

6.1 Place all switches to **OFF**.

6.2 Place POWER key switch on the CC to **OFF**.

WARNING

Proper PPE, including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

6.3 Place the M-CB actuator on the front of the MCC to **OFF**.

6.4 WH, perform the following:

- Disconnect both ends of cable harnesses 5 and 6 between the SP and FC and replace the cable connector covers.
- Disconnect the two quick disconnect air hoses between SP and the FC and replace dust caps.
- Disconnect air supply hose from SP.

7.0 REMOVAL OF FC

7.1 Lift the FC with the 41-ton forklift.

NOTE

Steps 7.2 through 7.19, may be performed in parallel with Section 8.0.

7.2 Transport the FC to the FC Transfer Car (FCTC) at the waste hoist station.

WARNING

Proper PPE, including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

7.3 WH, ensure cable reel power supply disconnect switch, 53P-SW04-105 is in the **OFF** position.

7.4 Connect the power cable from the cable reel to the rear side receptacle on the FCTC labeled CAR POWER 480V/3PH/60Hz.

7.5 Ensure circuit breaker on the travel motor starter box door in **ON**.

7.6 Place disconnect switch 53P-SW04/105 is in the **ON** position.

7.7 Position the FCTC to allow for FC placement.

7.8 Place the FC onto the FCTC.

7.9 WH, drive FCTC from E-140 intersection towards waste conveyance until FCTC is past cable reel.

WARNING

Proper PPE, including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

7.10 Place disconnect switch 53P-SW04/105 in the **OFF** position.

7.11 Disconnect the FCTC power cable from the receptacle.

7.12 Connect the FCTC power cable to the opposite side receptacle on the car labeled CAR POWER 480V/3PH/60Hz.

WARNING

Proper PPE, including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

7.13 Place disconnect switch, 53P-SW04/105 in the **ON** position.

NOTE

Appropriate drying agent may be utilized to allow for FCTC placement on waste conveyance.

7.14 Drive the FCTC onto waste conveyance.

7.15 Ensure conveyance lock pin is in place on the FCTC.

WARNING

Proper PPE, including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

7.16 Place disconnect switch, 53P-SW04/105 in the **OFF** position.

7.17 Disconnect the FCTC power cable from the FCTC.

7.18 Transfer the FCTC with empty FC to the surface.

7.19 Notify RH WH personnel on the surface that the FC and FCTC are being transported to the surface.

8.0 EXTENDING STAGING PLATFORM

WARNING

Proper PPE, including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

8.1 Place M-CB actuator on front of MCC to **ON**.

8.2 Place the POWER key switch on the CC to **ON**.

8.3 If removing WTMA with 20-ton forklift, perform the following:

8.3.1 Place MODE SW1 to **OPERATE**.

8.3.2 Place MODE SW2 to **EMPLACE** or **RETRIEVE**.

8.3.3 Place the TRANSFER CARRIAGE PUMP switch to **ON**.

WARNING

When extending TC on HERE, operators must be alert to prevent personnel from being caught between moving parts.

CAUTION

TC should not be extended more than approximately 4 in. from the end of the rails or the bearings may be damaged.

8.3.4 Place the TRANSFER CARRIAGE switch to **EXTEND**.

8.3.5 **WHEN** the TRANSFER CARRIAGE is approximately within 4 in. on the end of the Thompson Rails,
THEN return the TRANSFER CARRIAGE switch to the **OFF** position.

8.3.6 Place the TRANSFER CARRIAGE PUMP switch to **OFF**.

8.3.7 Place MODE SW2 to **OFF**.

8.4 Place MODE SW1 to **ASSY/DISASSY**.

WARNING

When extending SP on HERE, operators must be alert to prevent personnel from being caught between moving parts.

8.5 Place the STAGING PLATFORM switch to **EXTEND**.

8.6 When the leveling platform (LP) to SP transportation hold-down brackets are aligned with each other, return the STAGING PLATFORM switch to **OFF**.

8.7 Place all switches in the **OFF** position.

8.8 Place POWER key switch on the CC to **OFF**.

CAUTION

Clamps should be tightened only enough to restrict the TC from rolling along the rail. Over-tightening could damage the roller bearings.

9.0 PREPARATION OF WASTE TRANSFER MACHINE ASSEMBLY FOR TRANSPORT

- Install the brackets between the LP and the SP and tighten the bolts for transportation.
- Install the TC to SP attachment clamps around the TC roller bearings.

10.0 SHIFTING WASTE TRANSFER MACHINE ASSEMBLY WEIGHT TO FORKLIFT

10.1 Engage the cutouts on the LP and raise the forks until the forklift is supporting the weight of the WTMA.

10.2 Place POWER key switch on the CC to **ON**.

10.3 Place MODE SELECT SW1 to **ASSY/DISASSY**.

10.4 Place the TRANSFER CARRIAGE PUMP switch to **ON**.

10.5 Rotate the JACK 4 control switch to the DOWN position to raise the jack footpad to the fully retracted position.

10.6 Verify the RETRACTED LED for JACK 4 is **ON**.

11.0 REMOVAL OF WASTE TRANSFER MACHINE ASSEMBLY FROM ALIGNMENT FIXTURE ASSEMBLY

11.1 Place all switches on the CC to **OFF**.

11.2 Place POWER key switch on the CC to **OFF**.

WARNING

Proper PPE, including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

11.3 Place M-CB actuator on the front of the MCC to **OFF**.

11.4 Place the Site Power Breaker to **OFF**.

WARNING

Personnel **MUST** ensure that body parts are not under the suspended load while making the following connections because WTMA is suspended during this operation.

11.5 Disconnect cable harnesses 3, 4, 12, and Y at the SP end only and replace the connector covers.

11.6 Disconnect cable 12 and power cable from the connector on the AFA MCC.

11.7 Using appropriate controls, lift the WTMA until it is clear of the AFA alignment pins.

11.8 Stage the WTMA out of the way to allow access to the AFA.

12.0 SHIFTING WEIGHT OF ALIGNMENT FIXTURE ASSEMBLY TO FORKLIFT

12.1 Verify the 480V site power cable is plugged into the AFA MCC.

WARNING

Proper PPE, including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

12.1.1 Place the Site Power Breaker to **ON**.

12.2 Place M-CB actuator on the front of the MCC to **ON**.

12.3 Place the POWER key switch on the CC to **ON**.

12.4 Place the MODE SW1 to **ASSY/DISASSY**.

12.5 Engage the forklift pockets on the AFA until the forklift is supporting the weight of the AFA.

12.6 Place the ALIGNMENT FIXTURE PUMP switch to **ON**.

12.7 Rotate JACK 1, 2, and 3 control switches to the **DOWN** position to raise the jack footpads to the retract position.

13.0 DISCONNECTION OF AFA

13.1 Place all switches on the CC to **OFF**.

13.2 Place POWER key switch on the CC to **OFF**.

WARNING

Proper PPE, including long sleeve 100% cotton shirt, safety glasses, and leather gloves, must be worn while opening and closing breakers.

13.3 Place the M-CB actuator on the front of the MCC to **OFF**.

13.4 Place the Site Power Breaker to **OFF**.

13.5 Disconnect the site supply cable from the MCC or the AUX enclosure and store in appropriate location.

13.6 Disconnect cable harnesses 1, 2, and Z between the MCC or auxiliary enclosure and the CC and replace the connection covers.

13.7 Move the CC, if possible, to the next borehole for setup.

13.8 Move the AFA, if possible, to the next borehole for setup.

13.9 Remove the pintle from the shield plug.

14.0 INSTALLATION OF SHIELD RINGS

14.1 **IF** survey at Step 5.1 is ≥ 5 mR/hr at 30 cm,
THEN perform the following:

14.1.1 WH, install shield ring.

14.1.2 RCT, perform dose rate survey around shield ring; if ≥ 5 mR/hr at 30 cm, repeat Step 14.1.1 until dose rate is < 5 mR/hr at 30 cm.

14.1.3 WH, document on Attachment 1, the number of shield rings installed.

SIGN-OFF WH

14.2 RCT, record the dose rates at 30 cm on Attachment 1, if applicable.

SIGN-OFF RCT or N/A

14.3 Performers of procedure, enter printed name, signature, date, and initials on Attachment 1.

15.0 WHE REVIEW

15.1 WHE, perform the following:

15.1.1 Review Attachment 1 for completeness.

15.1.2 Print name, signature, and date on Attachment 1.

15.2 Forward original Attachment 1 to the Records Coordinator.

Attachment 1 - Disassembly Data Sheet

Step No.	DESCRIPTION	INITIAL
	PREREQUISITES	
3.0	Borehole information: Panel _____ Room _____ Number _____	WH_____
	PERFORMANCE	
5.2	Dose rate surveys of Shield Collar and Shield Plug Survey Number _____ Survey Date _____ _____ mR/hr at 30 cm	RCT_____
14.1.3	Number of shield rings installed _____	WH_____
14.2	Dose rate at 30 cm after shield ring(s) installed or N/A _____ mR/hr	RCT_____

Performers, enter printed name, signature, date, and initials:

Printed Name	Signature	Date	Initials

REMARKS: _____

REVIEW VALIDATION: _____

WHE: (Print Name) Signature Date