

# WP 05-WH1731

Revision 0

## Horizontal Emplacement and Retrieval Equipment Disassembly Using Distributed Controls

Technical Procedure

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APPROVED FOR USE

**CONTINUOUS USE PROCEDURE**

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## INTRODUCTION <sup>1,2</sup>

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 using distributed controls.

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.
- The size, weight, and powered operation of the Horizontal Emplacement Retrieval Equipment (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.
- If the Control Console (CC) will be left unattended with the CC POWER switch turned **ON**, **ENSURE** the Main Circuit Breaker (M-CB) actuator on front of Motor Control Center (MCC) is **OFF**. Performing this will eliminate control power to HERE controls and multiple re-boots of CC.
- 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.
- Safety glasses and a long sleeve 100% cotton shirt 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.
- 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 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 75 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.
- Readjustment of the AFA jacks (1, 2, or 3) and the WTMA jack (4) or the Show Level button may be adjusted as necessary to maintain level (GREEN light only) indications on TILT STATUS ARRAYS.

### **PREREQUISITE ACTIONS**

- 1.0 Verify preoperational inspections are completed on the following:
  - 6-ton forklift per WP 05-WH1711
  - 20-ton forklift per WP 05-WH1601
  - 41-ton forklift per WP 05-WH1602
- 2.0 Verify 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 in accordance with WP 05-WH1708 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**

Personnel **MUST** use the appropriate Personal Protective Equipment (PPE) while opening and closing breakers to prevent electrical burns.

**CAUTION**

To prevent damage to equipment, the boot-up time must be at least 5 minutes.

## 1.1 Initial CC Settings:

- 1.1.1 If needed, turn the POWER key switch to **ON**.
- 1.1.2 If needed, ensure HERE Startup screen appears.
- 1.1.3 If needed, verify all indicating lights come **ON**.
- 1.1.4 Ensure the M-CB actuator on the outside of the MCC is in the **ON** position.
- 1.1.5 Push "Level" button to view Level Screen.
- 1.1.6 On Level Screen, verify that power plug is mated for AFA Power Check and WTMA Power Check on the bottom left of screen.
- 1.1.7 Ensure TILT STATUS ARRAYS show only green on the display.

- 1.1.8 Push Canister Emplacement button to view Canister Emplacement screen.
  - 1.1.9 Push MODE SELECT SWITCH #1 button to OPERATE.
  - 1.1.10 Push MODE SELECT SWITCH #2 button to EMPLACE.
  - 1.1.11 Verify STAGING PLATFORM EXTEND LIMIT light is **ON**.
  - 1.1.12 Verify GRAPPLE OPEN light is **ON**.
  - 1.1.13 Verify CASK REAR SHIELD VALVE (RSV) and FRONT SHIELD VALVE (FSV) CLOSE lights are **ON**.
  - 1.1.14 Verify CASK RSV and FSV LOCKING PINS CLOSE lights are **ON**.
  - 1.1.15 Remove the C-clamps from the Staging Platform (SP) and TC.
  - 1.2 Push TC PUMP button to **ON**.
  - 1.3 Verify the TC locking mechanisms are in the LOCK position.
  - 1.4 Push the TRANSFER CARRIAGE button to RETRACT.
  - 1.5 When the TC automatically stops, push the TRANSFER CARRIAGE button to **OFF**.
  - 1.6 Push the TC PUMP button to **OFF**.
  - 1.7 Push all buttons to **OFF**.
- 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 If needed, turn the POWER key switch on the CC to **ON**.
- 3.2 Push the TC PUMP button to **ON**.
- 3.3 Push the MODE SELECT SWITCH #1 button to ASSY/DISASSY.
- 3.4 Push the TRANSFER CARRIAGE LOCKING MECHANISM button to UNLOCK until locking mechanism is in the UNLOCK position.
- 3.5 Verify the locking mechanisms are unlocked.
- 3.6 Push MODE SELECT SWITCH #1 button to OPERATE.
- 3.7 Push MODE SELECT SWITCH #2 button to EMPLACE.
- 3.8 Push the TRANSFER CARRIAGE button to EXTEND.
- 3.9 When the TC is flush with the back of the SP, push the TRANSFER CARRIAGE button to **OFF**.
- 3.10 Push the TC PUMP button to **OFF**.

### 4.0 RETRACTION OF STAGING PLATFORM

- 4.1 Ensure MODE SELECT SWITCH #1 button is in ASSY/DISASSY.
- 4.2 Push MODE SELECT SWITCH #2 button to **OFF**.
- 4.3 Push AFA PUMP button to **ON**.
- 4.4 Push the AFA LOCKING MECHANISM button to UNLOCK, hold for at least 15 seconds, then release.
- 4.5 Push the AFA PUMP button to **OFF**.
- 4.6 Push the STAGING PLATFORM button to RETRACT.
- 4.7 When the RETRACT LIMIT light comes **ON** and the SP automatically stops, push the STAGING PLATFORM button 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  $\geq 5/mR/hr$  at 30 cm,  
**THEN** control in accordance to WP 12-HP1500.

**6.0 DISCONNECTING FC**

- 6.1 Push all buttons to **OFF**.

**WARNING**

Personnel **MUST** use the appropriate PPE while opening and closing breakers to prevent electrical burns.

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

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### NOTE

When empty FC is placed on cribbing, procedure may be continued at Step 8.0.

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- 7.2 Transport the FC to the FC Transfer Car (FCTC) at the waste hoist station or place empty FC adjacent to rib on cribbing.
- 7.3 When applicable, place the FC onto the FCTC.
- 7.4 Drive the FCTC from E-140 intersection onto waste conveyance.
- 7.5 Verify conveyance lock pin is in place on the FCTC.
- 7.6 Verify power is de-energized to the FCTC.
- 7.7 Disconnect the power cable from the FCTC.
- 7.8 Transfer the empty FC to the surface.
- 7.9 Notify RH WH personnel on the surface that the FC and FCTC are being transported to the surface.

## 8.0 EXTENDING STAGING PLATFORM

### WARNING

Personnel **MUST** use the appropriate PPE while opening and closing breakers to prevent electrical burns.

- 8.1 If needed, turn the POWER key switch on the CC to **ON**.
- 8.2 Place M-CB actuator on front of MCC to **ON**.
- 8.3 Push MODE SELECT SWITCH #1 button to ASSY/DISASSY.
- 8.4 Push the TC PUMP button to **ON**.
- 8.5 Push the TRANSFER CARRIAGE button to EXTEND.
- 8.6 When the TRANSFER CARRIAGE is flush with the back of the SP, push the TRANSFER CARRIAGE button to **OFF**.
- 8.7 Push the TC PUMP button to **OFF**.

- 8.8 Push the STAGING PLATFORM button to EXTEND.
- 8.9 When the leveling platform (LP) to SP transportation hold-down brackets are aligned with each other, push the STAGING PLATFORM button to **OFF**.
- 8.10 Push all buttons 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 on the 20-ton or 41-ton forklift until the forklift is supporting the weight of the WTMA.
- 10.2 If needed, turn POWER key switch on the CC to **ON**.
- 10.3 Push "Level" button to view Level screen.
- 10.4 Push MODE SELECT SWITCH #1 button to **ASSY/DISASSY**.
- 10.5 Push the TC PUMP button to **ON**.
- 10.6 Push the JACK 4 control button to the DOWN position to raise the jack footpad to the fully retracted position.
- 10.7 Verify the RETRACTED light for JACK 4 is **ON**.

## 11.0 REMOVAL OF WASTE TRANSFER MACHINE ASSEMBLY FROM ALIGNMENT FIXTURE ASSEMBLY

11.1 Push all buttons on the CC to **OFF**.

### WARNING

Personnel **MUST** use the appropriate PPE while opening and closing breakers to prevent electrical burns.

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

11.3 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.

11.4 Disconnect cable 15 and power cable, if needed, from the connectors on the AFA MCC.

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

11.6 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 Ensure the 480V site power cable is plugged into the AFA MCC.

### WARNING

Personnel **MUST** use the appropriate PPE while opening and closing breakers to prevent electrical burns.

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

12.2 If needed, turn the POWER key switch on the CC to **ON**.

12.3 Push "Level" button to view Level screen.

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

- 12.5 Push the MODE SELECT SWITCH #1 button to ASSY/DISASSY.
  - 12.6 Utilizing the 20-ton forklift, engage the forklift pockets on the AFA until the forklift is supporting the weight of the AFA.
  - 12.7 Push the AFA PUMP button to **ON**.
  - 12.8 Push JACK 1, 2, and 3 control buttons to DOWN to raise the jack footpads to the retract position.
- 13.0 DISCONNECTION OF AFA
- 13.1 Push all buttons on the CC to **OFF**.
  - 13.2 If needed, turn the POWER key switch on the CC to **OFF**.

**WARNING**

Personnel **MUST** use the appropriate PPE while opening and closing breakers to prevent electrical burns.

- 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 Move the CC, if possible, to the next borehole for setup.
  - 13.7 Move the AFA, if possible, to the next borehole for setup.
  - 13.8 WH, remove the pintle from the shield plug.
- 14.0 INSTALLATION OF SHIELD RINGS
- 14.1 **IF** survey at Step 5.3 is  $\geq 5$  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  $\geq 5$  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.

