

WP 05-WH1750

Revision 6

Master-Slave Manipulator (41-T-103 A, B, C, & D)

Technical Procedure

EFFECTIVE DATE: 02/05/09

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APPROVED FOR USE

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INTRODUCTION ^{1,2}

This procedure provides the instructions for inspecting and operating Master-Slave Manipulators 41-T-103 A, B, C, and D at the Waste Isolation Pilot Plant (WIPP).

Performance of this procedure generates the following record(s), as applicable:

- Equipment Logbook

REFERENCES

BASELINE DOCUMENTS

- 40 CFR §264.15, "General Inspection Requirements"
- DOE Standard 1090-2007, *Hoisting and Rigging*
- *Installation, Operation and Maintenance Manual for the Model E-HD Master-Slave Manipulator*
- WP 04-AD3011, Equipment Lockout/Tagout
- Preliminary Safety Analysis Report for Remote-Handled Waste

REFERENCED DOCUMENTS

- WP 04-IM1000, Issues Management Processing of WIPP Forms
- EA04IM1000-1-0, WIPP Form

PRECAUTIONS AND LIMITATIONS

- Preoperational checks must be completed prior to the operation of the Master-Slave Manipulators at the first of each shift.
- Only personnel qualified as Waste Handling Technician/Engineer (WHT/WHE), Radiological Control Technician (RCT), or trainees under the direct supervision of a qualified WHT/WHE or RCT, are authorized to perform the activities specified in this procedure.
- If this procedure cannot be performed as written or in sequence, WHE shall be contacted.
- Master-Slave Manipulator must not be operated beyond rated capacity (50-pound weight limit).

- Electrical power to the Master-Slave Manipulators must not be turned off; this causes an improper shutdown of the closed-circuit TV (CCTV) system.
- Caution must be used when operating the Master-Slave Manipulator, because damage can occur to equipment and Hot Cell windows.
- Applying excessive force to grip can cause damage to the Master-Slave Manipulator and to objects being handled.
- Safety glasses and a long-sleeve 100% cotton shirt must be worn when opening and closing breakers.

PREREQUISITE ACTIONS

- 1.0 Review Equipment Logbook for outstanding deficiencies and Action Requests (ARs).
- 2.0 If a required inspection goes delinquent, perform the following:
 - 2.1 Immediately notify Site Environmental Compliance (SEC) of the delinquent inspection.
 - 2.2 Schedule and complete the inspection.
 - 2.3 Document the following in a letter to SEC within five working days:
 - Schedule of inspection
 - Reason(s) why the inspection was not performed
 - Any measures taken to offset the negative impacts resulting from not performing the inspection
 - Actions to prevent further delinquencies
 - 2.4 WH, **GO TO** WP 04-IM1000, and determine if a WIPP Form (EA04IM1000-1-0) is required.

NOTE

Preoperational checks are required only on the Master-Slave Manipulator to be used.

- 3.0 Record Equipment Number and Not Applicable (N/A) run hours in the Equipment Logbook.

PERFORMANCE

1.0 PREOPERATIONAL CHECKS

- 1.1 Obtain keys from lock box or WHE.
- 1.2 Remove locks from tamper lock device.
- 1.3 Ensure Master-Slave Manipulator path is clear of obstruction.
- 1.4 Ensure Master-Slave Manipulator is free of dirt, debris, and damage.
- 1.5 Ensure tapes and cables are in proper location.

NOTE

Hot Cell visual inspections may be performed using CCTV.

- 1.6 Visually inspect the tongs/fingers.
- 1.7 Visually inspect slave boots.
- 1.8 Ensure power is ON at 41P-DPO3/2 breakers 21 and 23.
- 1.9 Ensure the Master-Slave Manipulator in operation has air supply regulator set at approximately 90 pounds per square inch (psi).
- 1.10 Ensure indicating lights function properly.

CAUTION

Caution must be exercised when releasing master arm after use. The arm, unless locked, can strike and damage a Hot Cell window.

- 1.11 Ensure X, Y, and Z manual motions function properly.
- 1.12 Ensure X, Y, and Z electrical motions function properly.
- 1.13 Ensure X, Y, and Z air locks lock each function.

CAUTION

Excessive force to grips may cause damage to the tapes and cables, or the object being gripped.

- 1.14 Ensure tong and two-speed handle work properly.

- 1.15 Ensure ratchet grips work properly.
- 1.16 Initiate ARs to resolve any deficiencies that **CANNOT** be corrected by Waste Handling Operations.
- 1.17 Perform the following:
 - 1.17.1 Notify WHE of any deficiencies discovered during preoperational checks, and the status of each (e.g., deficiencies corrected and ARs generated).
 - 1.17.2 Notify WHE and report status of preoperational check.
- 1.18 Record the following information in Equipment Logbook:
 - Deficiencies noted
 - Corrective actions taken (outstanding/newly generated ARs, etc.)
- 1.19 Enter time, date, and signature in Equipment Logbook to document performance of preoperational checks.
- 1.20 WHE, review Equipment Logbook weekly, generally the last work day of the week.

2.0 MASTER-SLAVE MANIPULATOR OPERATION

- 2.1 Ensure power is ON at 41-DPO3/2 breakers 21 and 23.
- 2.2 Operate appropriate controls to perform desired function and/or operation.

3.0 MASTER-SLAVE MANIPULATOR SHUTDOWN

- 3.1 Ensure grip is OPEN and free of load.
- 3.2 Place Master-Slave Manipulator arms in vertical position.
- 3.3 Verify indicating lights show neutral position.
- 3.4 Place Master-Slave Manipulator handle in tamper lock device and lock in position.
- 3.5 Return keys to lockbox or WHE.