

WP 04-HO1002

Revision 12

Salt Handling Shaft Hoist Operation

Technical Procedure

EFFECTIVE DATE: 10/28/09

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APPROVED FOR USE

Official Use Only

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INTRODUCTION ¹

This procedure provides the steps necessary for operating the Salt Handling Shaft Hoisting System and includes the following:

- Hoist start-up (including preoperational checks, which shall include inspecting for deterioration)
- Hoist shift change operational checks
- Hoist emergency bypass mode operation
- Hoist shutdown
- Auxiliary Air Compressor and Air Dryer operation
- Dual Silicon Control Rectifier (SCR) converters operation
- Motor-Generator (MG) start-up and shut down

Performance of this procedure generates the following records, as applicable.

- Hoist Trip Recorder Chart
- Salt Hoist Operator's Log Sheet

REFERENCES

BASELINE DOCUMENTS

- 30 CFR Part 57, "Safety and Health Standards—Underground Metal and Nonmetal Mines"
- Electrical Control Equipment by General Electric, consisting of:
 - Elementary Drawing 237B9964
 - Assembly Drawing 237B9965
- General Electric SILCOMATIC Power Conversion Elementary Drawing 237B9918
- WP 12-IS.01, Industrial Safety Program - Structure and Management

REFERENCED DOCUMENTS

- WP 04-HO4002, Salt Hoist Alarm Response
- WP 04-IM1000, Issues Management Processing of WIPP Forms

- EA04IM1000-1-1, WIPP Form
- WP 13-QA30004, Nonconformance Report

PRECAUTIONS AND LIMITATIONS

- Only qualified personnel are allowed to operate the conveyance and signal systems.
- Personnel must inform the Hoist Operators prior to working on shafts or compartments that affect hoisting operations.
- Handheld radios shall not be used inside the Hoist Electrical Room.
- Hoist operating personnel must be prepared to respond immediately to all emergency situations that may require hoisting or lowering services.
- Only Cognizant Engineers, designated Hoist Operating and Maintenance Personnel, their supervisors, and Hoisting Management shall be in the Hoist Control Room/Hoist Electric Room. Other personnel requiring entry are to obtain authorization from Hoisting Management.
- The conveyance must be placed in a released condition (example: the conveyance is no longer needed at the level station that signals 2-1-2) and hoisted or lowered a suitable distance to prevent personnel from boarding/loading the conveyance when it is not in use.
- A qualified Hoist Operator is to be readily available at or near the hoist when semiautomatic hoisting is used.
- A qualified Hoist Operator must remain within hearing of the telephone or signaling device at all times while personnel are underground and the hoist is operated manually.
- During shift changes, a qualified Shaft Tender must be in charge of each mantrip.
- Smoking is prohibited in the conveyance and within 25 feet of the shaft.
- No eating, drinking, or possession of open food or beverage containers is permitted on normal mantrips.
- No materials and supplies other than small hand tools are allowed on the mandeck during scheduled mantrips.
- Items or materials being transported through the shaft must be secured or placed to prevent striking the sides of the shaft.

- Shaft Tenders are to be aware of hoist status and operating mode at all times through observation of Local Control Station (LCS) status lights or maintenance of communications with Hoist Operator and opposite Shaft Tenders.
- A qualified Shaft Tender must be in attendance at level station when sending or receiving mantrips.
- Only qualified personnel familiar with the posted signal system are to give or receive signals for conveyances or mantrips when personnel or material are being transported.
- Personnel shall not enter or leave the conveyance when it is in motion or after a signal to move the conveyance has been activated.
- Barriers shall be posted whenever the shaft collar is left unattended.
- Conveyance doors are to remain closed during mantrips and until the conveyance has come to a complete stop. A stop bell must be sounded before the shaft gates are opened if hoist is in manual mode.
- Hoist Operators must accept hoisting instructions only from the regular signal system unless it is out of order. In that event, or in an emergency, the Hoist Operator is to accept instructions directing conveyance movement only from Hoisting Management personnel, or their designated representatives.
- Signal system signs must be posted at all control stations where signals can be given or received.
- "Men Working in Shaft" signs must be posted at all devices controlling hoisting operations that may cause personnel endangerment.
- Shaft inspections and repair work must be performed from substantial platforms equipped with bonnets or other overhead protection.
- Hoisting Personnel shall not raise the Salt Hoist Conveyance above the top mandeck at the collar when the large work deck is on the Salt Hoist Conveyance. The large work deck has an oversized bonnet that can make contact with the dump chute in the headframe if the top mandeck is raised above the collar.
- If it is found or suspected that any part of the shaft or hoisting equipment is malfunctioning, the hoist shall not be used until the malfunction has been repaired or adjustments made.
- Hoisting personnel shall ensure that the door frame flanges are inserted properly in the saddles and that the locking pins are secured during preoperational checks and whenever the doors are installed.

- Load Interrupter Switches (LIS) **SHALL NOT** be operated from CLOSED to OPEN with a connected load.
- Protective relays limit operation as follows:
 - A circuit breaker (CB) that has a flag displayed **SHALL NOT** be CLOSED.
 - Equipment being served by tripped CB **SHALL NOT** be energized.
 - Relay flags may be reset only after Maintenance or Engineering, and Facility Shift Manager concur.

PREREQUISITE ACTIONS

WARNING

Closing a circuit breaker with a flag displayed could cause personnel injury or equipment damage.

- 1.0 Verify that NO protection relay flags are present prior to closing Breaker Control CB7 at 38P-SWG05/1.
- 2.0 **IF** protection relay flags are present **DO NOT CLOSE** Breaker Control CB7 **AND** notify Central Monitoring Room Operator (CMRO) and Hoisting Operations Manager.
- 3.0 Verify power is supplied to 38P-MCC04/2 from Substation 5, CB 2; or 38P-SWG05/1, CB 7.
- 4.0 Review Salt Hoist Operator's Log Sheet and note the following:
 - Special instructions
 - Hoist system abnormalities
 - Maintenance performed
- 5.0 If a required inspection goes delinquent, perform the following:
 - 5.1 **GO TO** WP 13-QA3004 and generate a nonconformance report.
 - 5.2 Immediately notify Site Environmental Compliance (SEC) of the delinquent inspection.
 - 5.3 Schedule and complete the inspection.

- 5.4 Document the following in a letter to SEC within five working days:
- The schedule for inspection
 - The reason(s) why the inspection was not performed
 - Any measures taken to offset the negative impacts resulting from not performing the inspection
 - Actions taken to prevent further delinquencies
- 5.5 SEC, **GO TO** WP 04-IM1000, and determine if a WIPP Form (EA04IM1000-1-1) is required.

PERFORMANCE

1.0 HOIST START-UP

- 1.1 Notify CMRO that hoist will be started.

NOTE

Air Dryer must run at least five minutes before placing compressed air system in service.

- 1.2 Ensure Air Dryer compressor is **ON**.
- 1.2.1 **IF** the Air Dryer compressor is **NOT** on, **THEN** start the Air Dryer compressor and note the time the compressor was started.
- 1.3 Ensure air valve PA-384-V-020 (at 38-K-001) is OPEN.
- 1.4 Ensure Salt Hoist Control Power 38P-HCP04/3 is in NORMAL position.
- 1.5 Ensure the following indications on UPS 38P-UPS03/1:
- Run-Stop rocker switch in the RUN position
 - AC line **ON** (green light)
 - Inverter **ON** (green light)
 - Fault light **OFF** (red light)
- 1.6 Ensure Salt Hoist Motor Field Power CB 38P-FE03/1 (38P-MCC04/2) is **ON**.
- 1.7 Ensure thermostats (on north and south walls) are set between 68°F and 75°F.

- 1.8 **IF** Converters are inoperable,
THEN GO TO Section 5.0, MG Set Start-Up, and
RETURN TO Step 1.10.
- 1.9 Ensure Salt Handling Hoist SCR Unit Control Power CBs 38P-PC04/1 and 38P-PC04/2 are **ON**.

NOTE

Steps 1.10 through 1.11.5 are used to start up each converter. When both converters are being started, Steps 1.10 through 1.11.5 are repeated for each unit.

- 1.10 Verify 13.8 kV interrupter switch 38P-SW15/2 or 38P-SW15/3 is closed by checking that the Phase 1, Phase 2, and Phase 3 lights are illuminated on upper left side of SCR unit.
- 1.11 Verify the following:
 - 1.11.1 AC CB Closed Red Indicating Light (FIL) 1 is **ON** (SCR panel).
 - 1.11.2 Bridge fans are running.
 - 1.11.3 Bridge test is complete (Converter Fault RIL indicator light is **ON**).
 - 1.11.4 DC Power Break switch is **ON** (indicated by red indicator flag).
 - 1.11.5 Converter Fault RIL goes out.
- 1.12 Perform the following on Annunciator Panel:
 - 1.12.1 Depress Annunciator Lamp Test push button.
 - 1.12.2 Verify all indicators are operational.
 - 1.12.3 Depress Annunciator Reset push button.
 - 1.12.4 Notify Hoist Management of any abnormal conditions.

NOTE

Trip Recorder must be operating any time hoist is operating, unless otherwise directed by Hoisting Management.

- 1.13 Ensure the following on the Trip Recorder:
 - Ink supply - ink not fading
 - Recorder chart paper - color stripe not showing

- Trip Recorder **ON** in HOUR position
- 1.14 Enter the following information on recorder chart, using black ink only:
- Recorder serial number each time new chart is started
 - Operator initials
 - Time
 - Date

NOTE

If Digital Depth Indicator does not coincide (within 12 feet) with Salt Mode Programmer, hoist will be operated in Digital Distance Programmer (DDP) bypass mode, until the DDP can be reset in accordance with Step 1.51, following completion of start-up.

- 1.15 If hoist control power has been off, verify digital/dial depth (Hoist Position) indicator coincides with Salt Mode Programmer and Personnel Mode indicator on DDP to within 12 feet.
- 1.16 Verify hoist house temperature is 40° to 90°F (indicator over hoist motor).

NOTE

Normal switch position is AUTO, which allows Auxiliary Air Compressor to auto-start should plant air supply fail.

- 1.17 Switch Auxiliary Air Compressor to AUTO.
- 1.18 Ensure the following:
- Incoming main air line valve, PA-384-V-004, is OPEN.
 - Air line from Auxiliary to Main Receiver, PA-384-V-015, is OPEN.
 - Air Dryer Receiver pressure is greater than 80 psig.
 - Dew Point Temperature (red) light is **OFF**.
 - Vapor separator sightglass is EMPTY.
- 1.19 Drain Air Dryer receiver until free of condensate.
- 1.20 Drain Auxiliary Air Compressor Receiver to 80 psi (75 to 85 psi).
- 1.21 Verify Auxiliary Air Compressor starts.

- 1.22 Open Air Dryer outlet valve PA-384-V-011.
- 1.23 Open Air Dryer inlet valve PA-384-V-009.
- 1.24 Close Air Dryer bypass valve PA-384-V-010.
- 1.25 If at any time during hoist operation Dew Point Temperature light comes on, perform the following:
 - 1.25.1 Turn Air Dryer **OFF**.
 - 1.25.2 Open bypass valve PA-384-V-010.
 - 1.25.3 Close inlet valve PA-384-V-009.
 - 1.25.4 Close outlet valve PA-384-V-011.
 - 1.25.5 Notify Hoisting Management.
 - 1.25.6 Minimize hoist usage until unit is restored.
- 1.26 Verify the following:
 - Hoist bearing temperature is 60° to 125°F (38P-HBA03/1).
 - Oil is visible in oil tank sightglass.

NOTE

Normal hoist operation will be on Lube Oil Pump 1. Lube Oil Pump 2 will be started once each week to check operability and to ensure readiness for operation if Lube Oil Pump 1 fails.

- 1.27 Start Lube Oil Pump 1 or Lube Oil Pump 2.
- 1.28 If Lube Oil Pump 2 was started, document start on Salt Hoist Operator's Log Sheet.
- 1.29 Drain air receivers under brake engines.
- 1.30 Perform a visual inspection and verify the following:
 - Brake engine air lubricators have oil in sightglass.
 - Brake engine pins and linkages are secure.
 - Brake pads are secure.
 - Both brake rings are free of oil, grease, and dirt.

- Lubricating oil system is free of oil leaks.
 - Bearings have sufficient oil flow (steady stream in sightglass).
 - Wheel and mounting fasteners are undamaged on speed feedback tach.
 - Belt on pulse tach is free of fraying, cracks or ply separation.
 - Belt on Roto-Pulse tach is free of fraying, cracks, or ply separation.
 - Pins, linkages, and gears on Lilly Controller are secure.
- 1.31 Set Hoist Motor A/C unit controls to COOL, and fan to AUTO.
- 1.32 Depress Lamp Test push button for annunciator lights in Hoist Cab and verify that annunciator lights illuminate.
- 1.33 Depress Lamp push buttons on Master Control Station (MCS) and verify that lights on MCS panel illuminate.
- 1.34 **IF** any equipment or indicator lights indicate malfunction or inoperable condition,
THEN notify Hoist Management.

NOTE

Performance of Steps 1.65 through 1.78 are necessary to satisfy requirements of 30 CFR Part 57.

- 1.35 Ensure the following:
- 1.35.1 Cage in RELEASED condition.
 - 1.35.2 Mode selector switches lined up as follows (as read left to right):
 - Manual Speed Select to NORMAL, REDUCED, or SHAFT INSPECTION
 - Speed Profile Control to SALT, PERSONNEL UPPER DECK, or PERSONNEL LOWER DECK
 - Brake Maintenance to NORMAL
 - HOIST mode to MANUAL
 - Control Location to MASTER STATION
- 1.36 Place Armature Loop Control Lockoff in NORMAL position.

- 1.37 Reset Emergency Stop push button.
- 1.38 Depress Safety Reset push button to reset power.
- 1.39 Verify Safety Reset (green) light is **ON**.
- 1.40 Visually check brake engine travel/pad wear indicator on each brake engine.

NOTE

Whenever Loop Contactor is opened, an alarm will sound on MCS Console. Fault causing alarm will be displayed on annunciator panel.

- 1.41 Manually verify following limits on Lilly Controller for proper operation:
 - Overspeed
 - Hoisting overtravel (OT)
 - Lowering OT
- 1.42 Depress Safety Reset push button to reset power.
- 1.43 Perform Static Test of Emergency Stop push button at MCS as follows:
 - 1.43.1 Depress Emergency Stop push button.
 - 1.43.2 Verify the following:
 - Loop Contactor Open (red) light is **ON**.
 - Brake weights drop.
 - Emerg. Stop P.B. annunciator light flashes.
 - Alarm sounds on MCS console.
 - 1.43.3 Silence alarm.
 - 1.43.4 Release Emergency Stop push button.
- 1.44 Depress Safety Reset push button to reset power.
- 1.45 Perform Dynamic Brake Test as follows:
 - 1.45.1 Turn Dynamic Brake Test keyed switch to DYN TEST.

- 1.45.2 **IF** Safety Reset light goes **OFF**, **AND** alarm sounds during Dynamic Brake test,
THEN momentarily depress Safety Reset.

CAUTION

To prevent damage to hoisting system during performance of Dynamic Brake Test, hoist should not move or slip through brakes.

- 1.45.3 Momentarily apply 6,000 amps of power.
- 1.45.4 Turn Brake Maintenance switch to left brake L-BRK REL.
- 1.45.5 Verify that left brake releases.
- 1.45.6 Momentarily apply 6,000 amps of power.
- 1.45.7 Return Brake Maintenance switch to NORMAL.
- 1.45.8 Turn Brake Maintenance switch to right brake R-BRK REL.
- 1.45.9 Verify that right brake releases.
- 1.45.10 Momentarily apply 6,000 amps of power.
- 1.45.11 Return Brake Maintenance switch to NORMAL.
- 1.45.12 Turn Dynamic Brake Test keyed switch to **OFF**.
- 1.46 Verify the following by mine phone conversation with Shaft Tender:
- Mine phone is operable.
 - Collar is clear of obstructions.
- 1.47 Ensure conveyance is at collar.

NOTE

Hoist Operator may fill out Salt Hoist Operator's Log Sheet for Shaft Tender in accordance with Shaft Tenders telecon instructions.

- 1.48 Shaft Tender, perform daily checks in accordance with Salt Hoist Operator's Log Sheet and document results.
- 1.49 Ensure the conveyance is empty of personnel and material and then notify the Hoistman.

- 1.50 Hoistman, perform first complete trip of the shift with empty conveyance.
- 1.51 **IF** Digital Depth Indicator and Salt Mode Programmer did not coincide to within 12 feet in Step 1.15,
THEN perform the following:
- 1.51.1 Obtain permission to reset DDP from Hoist Management.
- 1.51.2 Position conveyance with lower mandeck at collar.
- 1.51.3 Position conveyance with skip at dump.
- 1.51.4 Verify readings coincide within 12 feet.
- 1.51.5 Depress DDP Reset (green) push button.
- 1.51.6 Verify (green) DDP Reset light illuminates and remains illuminated.
- 1.52 Perform Salt Mode Hoisting OT Test:
- 1.52.1 Raise Hoist slowly to Lilly Overtravel indicator on hoist drum.
- 1.52.2 Verify the following:
- Loop Contactor Opens - (red) light is **ON**.
 - Brake weights drop.
 - Hoist OT annunciator light flashes.
 - Alarm sounds on MCS console.
- 1.52.3 Silence alarm.
- 1.53 Perform Hoisting Magnetic OT Test:
- 1.53.1 Place OT/Backout (BO) switch in RAISE OT TEST position.
- 1.53.2 While holding OT/BO switch in RAISE OT TEST position, depress Safety Reset push button to reset power.
- 1.53.3 Raise to MAGNETIC OVERTRAVEL position indicated on hoist drum.
- 1.53.4 Verify the following:
- Loop contactor opens - (red) light is **ON**.

- Brake weights drop.
- Hoist OT annunciator light flashes.
- Alarm sounds on MCS console.

1.53.5 Silence alarm.

1.54 Perform OT/BO Test:

NOTE

Performing Step 1.54.1 will cause OT/BO (white) light on MCS to flash.

1.54.1 Place OT/BO switch in BO RAISE position.

1.54.2 While holding OT/BO switch in BO RAISE position, depress Safety Reset push button to reset power.

1.54.3 Verify hoisting power cannot be applied.

1.54.4 Apply lowering power to lower away from OT condition.

NOTE

Performance of Step 1.55 resets salt mode DDP to 49 feet.

1.55 Return conveyance to Dump position.

1.56 Verify Conveyance at Dump light (white) illuminates.

CAUTION

Equipment damage will be prevented by not exceeding 500 fpm (feet per minute) under the following conditions:

- Present trip is first trip of day.
- Maintenance has been performed in shaft.
- Oversized load has been sent through shaft.

1.57 Move conveyance through shaft while observing ammeter for indications of shaft obstruction.

1.58 Verify conveyance decelerates in salt retard zone.

1.59 Verify Loading Pocket light comes **ON** and goes **OFF** as muck skip passes loading pocket.

1.60 Perform Lowering OT Test:

1.60.1 Lower conveyance to Lilly Overtravel indicator on hoist drum.

1.60.2 Verify the following:

- Loop contactor opens - (red) light is **ON**.
- Brake weights drop.
- Lower OT annunciator light flashes.
- Alarm sounds on MCS console.

1.60.3 Silence alarm.

1.61 Perform Lowering Magnetic OT Test:

NOTE

Performing Step 1.61.1 will cause OT/BO (white) light on MCS to flash.

1.61.1 Place OT/BO switch to LOWER OT TEST position.

1.61.2 While holding OT/BO switch in LOWER OT TEST position, depress Safety Reset push button to reset power.

1.61.3 Lower to MAGNETIC OVERTRAVEL position indicated on hoist drum.

1.61.4 verify the following:

- Loop contactor opens - (red) light is **ON**.
- Brake weights drop.
- Lower OT annunciator light flashes.
- Alarm sounds on MCS console.

1.61.5 Silence alarm.

1.62 Perform OT/BO Test:

1.62.1 Place OT/BO switch in BO LOWER position.

1.62.2 While holding OT/BO switch in BO LOWER position, depress Safety Reset push button to reset power.

1.62.3 Verify lowering power cannot be applied.

1.62.4 Apply hoisting power to hoist away from OT condition.

CAUTION

If maximum hoist speed is exceeded by more than 10 percent, hoist overspeed will occur, possibly causing damage to shaft furnishings.

1.63 Hoist conveyance at full power to verify 1,800 (1,782 to 1,818) fpm.

1.64 Stop conveyance at approximately MID-SHAFT position as indicated on dial Indicator.

1.65 Manually check overspeeds on Lilly Controller:

1.65.1 Verify the following:

- Loop contactor opens - (red) light is **ON**.
- Brake weights drop.
- Lilly Overspeed indicator illuminates on annunciator panel.
- Alarm sounds on MCS console.

1.65.2 Silence alarm.

1.65.3 Depress Safety Reset push button to reset power.

1.66 Hoist conveyance at full power ensuring conveyance decelerates in salt retard zone.

1.67 Change Speed Profile control to PERSONNEL UPPER DECK mode.

1.68 Hoist conveyance past collar slowly.

1.69 Verify Conveyance at Collar level indicator illuminates as conveyance reaches collar.

1.70 Perform Personnel Hoisting OT Test:

1.70.1 Hoist slowly to Lilly Overtravel indicator on hoist drum.

1.70.2 Verify the following:

- Loop contactor opens - (red) light is **ON**.
- Brake weights drop.

- Hoist OT annunciator light flashes.
- Alarm sounds on MCS console.

1.70.3 Silence alarm.

1.71 Perform OT/BO Test:

NOTE

Performing Step 1.71.1 will cause OT/BO (white) light on MCS to flash.

1.71.1 Place OT/BO switch in BO RAISE position.

1.71.2 While holding OT/BO switch in BO RAISE position, depress Safety Reset push button to reset power.

1.71.3 Verify hoisting power cannot be applied.

1.71.4 Apply lowering power to lower away from OT condition.

1.72 Place Hoist Speed profile control to PERSONNEL LOWER DECK.

NOTE

Performance of Step 1.73 resets PERSONNEL mode DDP to zero feet.

1.73 Return conveyance to COLLAR position.

1.74 Verify Conveyance at Collar Level indicator light illuminates.

1.75 Lower conveyance through shaft at full speed and verify the following:

- Conveyance velocity 800 (792 to 808) fpm.
- Conveyance decelerates at personnel retard zone.
- Conveyance at Storage Level light illuminates when conveyance reaches station level.

1.76 Perform Personnel Lowering OT Test:

1.76.1 Lower slowly to Lilly Overtravel indicator on hoist drum.

1.76.2 Verify the following:

- Loop contactor opens - (red) light is **ON**.
- Brake weights drop.

- Lower OT annunciator flashes.
- Lower OT push button indicator flashes.
- Alarm sounds on MCS console.

1.76.3 Silence alarm.

1.77 Perform OT/BO Test:

NOTE

Performing Step 1.77.1 will cause OT/BO (white) light on MCS to flash.

1.77.1 Place OT/BO switch in BO LOWER position.

1.77.2 While holding OT/BO switch in BO LOWER position, depress Safety Reset push button to reset power.

1.77.3 Verify lowering power cannot be applied.

1.77.4 Apply hoisting power to hoist away from OT condition.

1.78 Return conveyance to released position.

1.79 Notify CMRO that hoist checks have been completed and hoist operation is satisfactory.

2.0 SHIFT CHANGE OPERATIONAL CHECKS

NOTE

This section is to be performed at the beginning of each shift.

2.1 Ensure the following on the Trip Recorder:

- Ink supply - ink not fading
- Recorder chart paper - color stripe not showing
- Trip Recorder **ON** in HOUR position

2.2 Enter the following information on recorder chart, using black ink only:

- Recorder serial number each time new chart is started
- Operator initials
- Time
- Date

NOTE

Items to be inspected are on the Salt Hoist Operator's Log Sheet.

- 2.3 Perform Salt Hoist Inspection.
 - 2.4 Document results of inspection on Salt Hoist Operator's Log Sheet.
 - 2.5 Perform Steps 1.43 through 1.78.
- 3.0 DDP BYPASS OPERATIONS MODE

NOTE

Hoist will be operated in DDP Bypass Operations Mode with approval of Hoist Management. Salt and Personnel mode indicators on DDP may not coincide with depth/dial indicators in hoist cab.

- 3.1 Obtain permission to operate hoist in DDP Bypass Operations Mode from Hoist Management.

CAUTION

To prevent overspeeding of hoist and damage to shaft furnishings, Hoist Operator must manually slow hoist in retard zones due to no automatic slowdowns.

- 3.2 **IF** DDP Reset (green) push button is illuminated, **THEN** cycle control power switch at 38P-HCP04/3.
- 3.3 Verify the following:
 - Programmer Bypassed light is flashing on hoist console.
 - DDP Emergency Reset (red) push button is **OFF**.
 - DDP Reset (green) push button is **OFF**.
- 3.4 Depress (red) DDP Emergency Reset push button.
- 3.5 Verify (red) DDP Emergency Reset push button illuminates and remains illuminated.

4.0 HOIST SHUTDOWN

- 4.1 Park conveyance in RELEASED position.
- 4.2 Notify CMRO hoist will be shut down.
- 4.3 Depress Emergency Stop push button to open safety loop.
- 4.4 Turn **OFF** Brake Air Compressor.
- 4.5 Turn **OFF** Lube Oil Pump switches.
- 4.6 Set Armature Loop Control Lockoff switch to LOCKOFF.
- 4.7 Remove key from Armature Loop Control Lockoff switch.
- 4.8 Configure air valves to bypass Air Dryer as follows:
 - 4.8.1 Open bypass valve PA-384-V-010.
 - 4.8.2 Close inlet valve PA-384-V-009.
 - 4.8.3 Close outlet valve PA-384-v-011.
- 4.9 Turn **OFF** Air Dryer compressor.
- 4.10 Turn **OFF** hoist motor A/C unit.
- 4.11 Depress (red) Off buttons on DC CBs at SCR Converters A and B.
- 4.12 Turn **OFF** Trip Recorder.
- 4.13 Depress Reset button on annunciator panel.
- 4.14 If hoist is being shut down for planned power outages, maintenance or as directed by Hoist Management, perform the following for complete hoist shutdown:
 - 4.14.1 Turn Control Power Switch 38P-HCP04/3 to **OFF**.
 - 4.14.2 Turn rocker switch to STOP position on UPS 38P-UPS03/1.
 - 4.14.3 Switch CB 38P-PC04/1 (38P-MCC04/2) to **OFF**.
 - 4.14.4 Switch CB 38P-PC04/2 (38P-MCC04/2) to **OFF**.
 - 4.14.5 Close air valve PA-384-V-020 (at 38-K-001).

5.0 MG SET START-UP

WARNING

Closing a circuit breaker with a flag displayed could cause personnel injury or equipment damage.

NOTE

Performance of this section will bring MG Set on line and isolate SCR Converters. Periodic start-up and hoist operation using MG Set is performed to assure MG Set operates properly and within required parameters.

- 5.1 Verify that NO protection relay flags are present prior to closing Breaker Control CB6 at 38P-SWG05/1-6.
- 5.2 **IF** protection relay flags are present **DO NOT CLOSE** Breaker Control CB6,
AND notify CMRO and Hoisting Operations Manager.
- 5.3 Ensure Breaker Control CB6 at 38P-SWG05/1-6 is **CLOSED**.
- 5.4 Perform the following at MCS:
 - 5.4.1 Depress Emergency Stop to open Armature Loop.
 - 5.4.2 Silence Alarm.
 - 5.4.3 Set Armature Loop Control Lockoff to LOCKOFF.

NOTE

Performance of Step 5.4.4 will cause SCR Operation light on MCS to go **OFF**.

- 5.4.4 Set keyed STATIC/MG Set switch to MG SET.
- 5.5 Perform the following in Hoist Electric Room:
 - 5.5.1 Push **OFF** button on DC CBs on both SCR Converters 38P-PC04/1 and 38P-PC04/2.
 - 5.5.2 Switch Control Power CBs 38P-PC04/1 and 38P-PC04/2 (38P-MCC04/2) to **OFF**.
 - 5.5.3 Switch Jacking Pump CB 38-G-004 (38P-MCC04/2) to **ON**.

- 5.6 Perform the following in Hoist Motor Room:
- 5.6.1 Open SCR (Normal) Pringle switch 38P-SW04/1.
 - 5.6.2 Close MG Set Pringle switch 38P-SW04/1.
 - 5.6.3 Ensure position of the following valves:
 - Flow valve to motor 38-GM-004A - OPEN
 - Flow valve to motor 38-GM-004B - CLOSED
 - Flow valves to three MG bearings - CLOSED
 - 5.6.4 Switch disconnect at Jacking Pump 38-GS-004 to **ON**.
 - 5.6.5 Depress Start push button.
- 5.7 Perform the following at MG Set:
- 5.7.1 Open flow valve at west-end outboard bearing.
 - 5.7.2 While looking into inspection cap, adjust pressure on bypass valve on Jacking Pump until flow is present in bearing.
 - 5.7.3 **WHEN** oil flow into bearing approaches overflow point,
THEN close flow valve.
 - 5.7.4 Open flow valve at east-end outboard bearing.
 - 5.7.5 While looking into inspection cap, adjust pressure on bypass valve on Jacking Pump until flow is present in bearing.
 - 5.7.6 **WHEN** oil flow into bearing approaches overflow point,
THEN close flow valve.
 - 5.7.7 **WHEN** both outboard bearings are pumped up,
THEN open flow valve to center bearing.
 - 5.7.8 Adjust bypass valve to maximum pressure of 1,800 to 2,000 psi.
 - 5.7.9 **WHEN** oil flow to center bearing approaches overflow point,
THEN close flow valve.
 - 5.7.10 Adjust bypass valve pressure to 500 (450 to 550) psi.

- 5.8 Perform the following at 38-GS-004:
- 5.8.1 Depress Stop button.
 - 5.8.2 Switch disconnect switch to **OFF**.
- 5.9 Switch Jacking Pump CB 38-G-004 at 38P-MCCO 4/2 to **OFF**.
- 5.10 Switch CB-2 and CB-4 for MG Heater (38P-DP03/1 at 38P-MCC04/2) to **OFF**.
- 5.11 Switch CB 38-B-014, MG Set A/C, at 38P-MCC04/2 to **ON**.
- 5.12 Set MG A/C thermostat to AUTO.
- 5.13 Verify operability of MG A/C by lowering thermostat temperature setting until A/C unit starts.
- 5.14 Reset thermostat setting to 72 (70 to 74) °F.
- 5.15 Perform the following in Hoist Electric Room:
- 5.15.1 Place Limitamp 2400 V disconnect 38P-SMC05/1 in **ON**.
 - 5.15.2 Place Hand/Off/Automatic (HOA) switch on Limitamp Control in **HAND**.

CAUTION

Waste Handling Hoist must be parked and secure to prevent damage to hoist.

- 5.16 Contact Waste Handling Hoist Operator to verify Waste Handling Hoist is parked and secure.
- 5.17 Momentarily depress Start push button on Limitamp Control.
- 5.18 Verify MG Set start-up.
- 5.19 Wait approximately one minute for MG Set to reach full speed and synchronize.
- 5.20 **IF** MG Set does not synchronize,
THEN perform the following:
- 5.20.1 Allow MG Set rotor to come to a complete stop.

5.20.2 Place HOA switch on Limitamp in **OFF**.

5.21 Perform the following in Hoist Electric Room:

5.21.1 Place HOA switch on Limitamp Control in **HAND**.

CAUTION

Waste Handling Hoist must be parked and secure to prevent damage to hoist.

5.22 Contact Waste Handling Hoist Operator to verify Waste Handling Hoist is parked and secure.

5.23 Momentarily depress Start push button on Limitamp Control.

5.24 Verify MG Set start-up.

5.25 Wait approximately one minute for MG Set to reach full speed and synchronize.

5.26 **IF** MG set did not start on second attempt, **THEN** perform the following.

5.26.1 Place HOA switch on Limitamp in **OFF**.

5.26.2 Place Limitamp 2400 V disconnect 38P-SMC05/1 in **OFF**.

5.26.3 Notify Hoist Management of start failure.

NOTE

Proper lubrication is indicated by the pickup rings rotating freely and picking up oil from bearing sump.

5.27 Verify MG Set bearings are properly lubricated.

5.28 Document MG Set start-up on Salt Hoist Operator's Log Sheet.

5.29 If MG Set will be used for hoisting operations, perform the following:

CAUTION

Sufficient warmup time, as indicated by 78 to 83 amps I-Field reading on Limitamp, is required to prevent damage to the MG Set.

5.29.1 Verify MG Set is warmed up sufficiently.

5.29.2 Perform the following in Hoist Electric Room:

[A] Switch Gen. Field Power Supply 38P-HCP04/3, CB-18 (38P-MCC04/2), to **ON**.

[B] Place Hoist Generator Exciter Disconnect in **ON**.

5.29.3 Place Armature Loop Lockoff switch in **NORMAL**.

NOTE

Hoist will become operational on MG Set power supply after performance of Step 5.29.4.

5.29.4 Depress Safety Reset push button to reset power.

6.0 MG SET SHUTDOWN AND CONVERTER START-UP

6.1 Perform the following at MCS:

6.1.1 Depress Emergency Stop to open Armature Loop.

6.1.2 Silence alarm.

6.1.3 Place Armature Loop Control Lockoff switch in **LOCKOFF**.

6.2 Perform the following in Hoist Electric Room:

6.2.1 Place Hoist Generator Exciter Disconnect in **OFF**.

6.2.2 Switch Gen. Field Power Supply 38P-HC04/3, CB-18 (38P-MCC04/2), to **OFF**.

6.2.3 Perform the following at Limitamp Control Panel:

[A] Depress Stop push button.

[B] Switch HOA switch to **OFF**.

- 6.3 Place Limitamp 2400 V disconnect 38P-SMC05/1 in **OFF**.
- 6.4 Place MG A/C thermostat in **OFF** position.
- 6.5 Switch 38-B-014, MG Set AC, at 38P-MCC04/2 to **OFF**.
- 6.6 Switch CB-2 and CB-4 for MG Heater (38P-DP03/1 at 38P-MCC04/2) to **ON**.
- 6.7 Open MG Set Pringle switch 38P-SW04/1 (Hoist Motor Room).
- 6.8 Perform the following to align switches for SCR operation:
 - 6.8.1 Close SCR (Normal) Pringle switch 38P-SW04/1 (Hoist Motor Room).
 - 6.8.2 Switch SILCO A480V CB 38P-PC04/1 (38P-MCC04/2) to **ON**.
 - 6.8.3 Switch SILCO B480V CB 38P-PC04/2 (38P-MCC04/2) to **ON**.
- 6.9 Verify the following:
 - 6.9.1 AC CB Closed RIL 1 is **ON** (SCR panel).
 - 6.9.2 Bridge fans are running.
 - 6.9.3 Bridge test is complete (Converter Fault RIL is **ON**).
 - 6.9.4 DC Power Break switch is **ON** (indicated by red indicator flag).
 - 6.9.5 Converter Fault RIL goes out.
- 6.10 Set Static/MG key switch to STATIC.
- 6.11 Verify the following:
 - SCR Operation (green) light is **ON**.
 - M/G Set Operation (green) light is **OFF**.
- 7.0 REVIEW
 - 7.1 Hoisting Manager, perform the following:
 - Review Salt Hoist Operator's Log Sheet for completeness.
 - Sign the log sheet as an indication of review approval and validation.

8.0 MANAGEMENT OF RECORDS

All records produced during the implementation this procedure are Resource Conservation and Recovery Act operating records and must be maintained in accordance with the respective department's Records Inventory and Disposition Schedule (RIDS). Final disposition after facility closure will be in accordance with the RIDS. Record retention is automatically extended by any enforcement action involving these records.

Official Use Only

Attachment 1 - Sample Salt Hoist Operators Log Sheet

DATE: _____

NIGHT SHIFT

I have read and noted all entries made by the previous shift hoistman and all special instructions.

I tested the hoist brakes at _____ (time) and report as follows: _____

I have tested the overwinds at _____ (time), and report as follows: _____

I made the following trial trips and report as follows (give time) _____

The working condition of the hoist: including brakes, clutches, and their interlocks: and depth indicator: and all safety devices and fittings: as follows: _____

The working condition of the signaling equipment was as follows: _____

Hoistman _____ Reviewed by: _____

SALT HOIST OPERATOR'S LOG

DAY SHIFT

I have read and noted all entries made by the previous shift hoistman and all special instructions.

I tested the hoist brakes at _____ (time) and report as follows: _____

I have tested the overwinds at _____ (time), and report as follows: _____

I made the following trial trips and report as follows (give time) _____

The working condition of the hoist: including brakes, clutches, and their interlocks: and depth indicator: and all safety devices and fittings: as follows: _____

The working condition of the signaling equipment was as follows: _____

Hoistman _____ Reviewed by: _____

MID SHIFT

I have read and noted all entries made by the previous shift hoistman and all special instructions.

I tested the hoist brakes at _____ (time) and report as follows: _____

I have tested the overwinds at _____ (time), and report as follows: _____

I made the following trial trips and report as follows (give time) _____

The working condition of the hoist: including brakes, clutches, and their interlocks: and depth indicator: and all safety devices and fittings: as follows: _____

The working condition of the signaling equipment was as follows: _____

Hoistman _____ Reviewed by: _____

Salt Hoist Inspection	TIME	COMMENTARY
1 Examination of Work Area	<input type="checkbox"/>	_____
2 Brake Paths - Clean	<input type="checkbox"/>	_____
3 Hoist Bearings - Oil Flow	<input type="checkbox"/>	_____
4 Pump Reservoir - Oil Level	<input type="checkbox"/>	_____
5 Air Brake Oilers - Oil Level	<input type="checkbox"/>	_____
6 Lilly Controller - Functional	<input type="checkbox"/>	_____
7 Drain Receivers/Dryer	<input type="checkbox"/>	_____
8 Hoist Mr. Vent. - Functional	<input type="checkbox"/>	_____
9 Hoist Gen.-No loose Connections	<input type="checkbox"/>	_____
10 Notified CMR - Hoist Operable	<input type="checkbox"/>	_____

TIME _____

Comments: _____

Hoistman _____ Time _____

Salt Collar Inspection	TIME	COMMENTARY
1 Examination of Work Area	<input type="checkbox"/>	_____
2 Rope Connection - No Slippage	<input type="checkbox"/>	_____
3 Safety Gates - No Damage	<input type="checkbox"/>	_____
4 Top Roller & Shoes - No Damage	<input type="checkbox"/>	_____
5 Conveyance Doors - No Damage	<input type="checkbox"/>	_____
6 Cage Welds - No Damage	<input type="checkbox"/>	_____
7 BTM Roller & Shoes - No Damage	<input type="checkbox"/>	_____
8 Cage Phone - Functional	<input type="checkbox"/>	_____
9 Safety Dogs - No Damage	<input type="checkbox"/>	_____
10 Bell Signal - No Damage	<input type="checkbox"/>	_____
11 Mine Phone - Functional	<input type="checkbox"/>	_____

Comments: _____

Toplander _____ Time _____

Salt Station Inspection	TIME	COMMENTARY
1 Examination of Work Area	<input type="checkbox"/>	_____
2 Station Steel - No Damage	<input type="checkbox"/>	_____
3 Safety Gates - No Damage	<input type="checkbox"/>	_____
4 Load Pocket - Oilers & Grease	<input type="checkbox"/>	_____
5 Load Pocket - Drain Air Line	<input type="checkbox"/>	_____
6 Sump Fan - Functional	<input type="checkbox"/>	_____
7 Mine Phone - Functional	<input type="checkbox"/>	_____
8 Bell Signal - Functional	<input type="checkbox"/>	_____

Comments: _____

Bottomlander _____ Time _____

Salt Hoist Inspection	TIME	COMMENTARY
1 Examination of Work Area	<input type="checkbox"/>	_____
2 Brake Paths - Clean	<input type="checkbox"/>	_____
3 Hoist Bearings - Oil Flow	<input type="checkbox"/>	_____
4 Pump Reservoir - Oil Level	<input type="checkbox"/>	_____
5 Air Brake Oilers - Oil Level	<input type="checkbox"/>	_____
6 Lilly Controller - Functional	<input type="checkbox"/>	_____
7 Drain Receivers/Dryer	<input type="checkbox"/>	_____
8 Hoist Mr. Vent. - Functional	<input type="checkbox"/>	_____
9 Hoist Gen.-No loose Connections	<input type="checkbox"/>	_____
10 Notified CMR - Hoist Operable	<input type="checkbox"/>	_____

TIME _____

Comments: _____

Hoistman _____ Time _____

Salt Collar Inspection	TIME	COMMENTARY
1 Examination of Work Area	<input type="checkbox"/>	_____
2 Rope Connection - No Slippage	<input type="checkbox"/>	_____
3 Safety Gates - No Damage	<input type="checkbox"/>	_____
4 Top Roller & Shoes - No Damage	<input type="checkbox"/>	_____
5 Conveyance Doors - No Damage	<input type="checkbox"/>	_____
6 Cage Welds - No Damage	<input type="checkbox"/>	_____
7 BTM Roller & Shoes - No Damage	<input type="checkbox"/>	_____
8 Cage Phone - Functional	<input type="checkbox"/>	_____
9 Safety Dogs - No Damage	<input type="checkbox"/>	_____
10 Bell Signal - No Damage	<input type="checkbox"/>	_____
11 Mine Phone - Functional	<input type="checkbox"/>	_____

Comments: _____

Toplander _____ Time _____

Salt Station Inspection	TIME	COMMENTARY
1 Examination of Work Area	<input type="checkbox"/>	_____
2 Station Steel - No Damage	<input type="checkbox"/>	_____
3 Safety Gates - No Damage	<input type="checkbox"/>	_____
4 Load Pocket - Oilers & Grease	<input type="checkbox"/>	_____
5 Load Pocket - Drain Air Line	<input type="checkbox"/>	_____
6 Sump Fan - Functional	<input type="checkbox"/>	_____
7 Mine Phone - Functional	<input type="checkbox"/>	_____
8 Bell Signal - Functional	<input type="checkbox"/>	_____

Comments: _____

Bottomlander _____ Time _____

SPECIAL INSTRUCTIONS
Requires Time, Date, & Authorized Signatures

