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INTEC	Technical Procedure	For Additional Info: http://EDMS	Effective Date: 10/04/12
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Manual: INTEC FSV3

USE TYPE 1Change Number: 337273

*The current revision can be verified on EDMS.

INTRODUCTION

1.1 Purpose

To provide instructions for moving Fuel Storage Containers (FSC) between storage locations.

1.2 Scope and Applicability

This procedure will typically be used to perform either of the following:

- A. Transfer a FSC from a vault position to a Standby Storage Well (SSW). This evolution may be performed for training/demonstration purposes or to isolate a leaking FSC in a SSW.
- B. Return a FSC from a SSW to a vault position. This evolution may be performed for training/demonstration purposes or following replacement of O-rings in a previously leaking FSC.

Training/demonstration evolutions normally use an FSC containing dummy fuel blocks. This procedure may also be used for other FSC handling operations such as moving an FSC from one vault position to another or between SSWs.

This procedure may be performed using an FSC containing dummy fuel blocks to satisfy Technical Specification Surveillance Requirement (SR) 3.2.1.2.

This procedure may be performed using an FSC containing spent fuel to satisfy Technical Specification 3.3.1 Action A.1.2.1, "Transfer the FSC to a storage well," within 7 days of exceeding a seal leak rate limit for an FSC or storage well.

This procedure DOES NOT incorporate Material Control and Accountability requirements. Removal/installation of SSW lid O-rings, when required, will be controlled by separate work instructions.

2. PRECAUTIONS AND LIMITATIONS

- 2.1 Personnel must follow the applicable hazard mitigations detailed in Appendix C, "Procedure Hazard Analysis."

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- 2.2 All applicable Precautions and Limitations must be observed when handling individual components (such as Container Handling Machine).
- 2.3 FSCs containing spent fuel must not be handled if the ambient air temperature is less than 12°F per FSV ISFSI Technical Specification (TS) Limiting Condition for Operation (LCO) 3.3.2. (SR 3.3.2.1)
- 2.4 An FSC containing spent fuel must not be handled, or its lid bolts removed, until a sample of the fuel storage atmosphere has been analyzed and determined not to contain a combustible gas mixture, or evacuated and purged with air per TPR-6493, “Fort St. Vrain Fuel Storage Container Vacuum Purge Procedure,” to assure hydrogen concentrations are below flammable levels (SAR 5.1.1.1).
- 2.5 If a Radiation Work Permit (RWP) is not required for this job and general area radiation levels exceed 2 mrem/hr or removable contamination levels (beta-gamma) exceed 1,000 dpm/100 cm² (by smear), work must be stopped IMMEDIATELY, the incident investigated, and an RWP processed before proceeding.
- 2.6 If the need arises to suspend operation (such as, for lunch, breaks, end of day, correct deficiency) before completion of the procedure, the following must be done:
 - A. Steps necessary to secure the Container Handling Machine (CHM) and/or crane must be performed and annotated in the margin with signature and date
 - B. When resuming work, the steps necessary to return the CHM and/or crane to operation (including daily crane checks if required) must be performed and annotated in the margin with signature and date.
- 2.7 Additional PPE must be indicated in the RWP if it is required.
- 2.8 The Container Handling Machine (CHM) must be fully operable during HANDLING OPERATIONS (LCO 3.2.1). In the event the CHM is not fully operable during HANDLING OPERATIONS, any contained spent fuel must be IMMEDIATELY lowered in the nearest safe storage location (LCO Action 3.2.1 A.1).
- 2.9 The MVDS Crane Hoist lift limits must be fully operable during STORAGE OPERATIONS and HANDLING OPERATIONS (LCO 3.2.2). In the event the MVDS Crane Hoist lifts the CHM above 3.5 in. during STORAGE OPERATIONS or HANDLING OPERATIONS, the CHM must be IMMEDIATELY lowered to the floor (LCO Action 3.2.2 A.1).

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- 2.10 If access to the CHM, working platform, or crane platform (bridge catwalk) is needed, the individual(s) on the platform and the crane operator must be in constant visual or verbal contact. Crane operation must only be directed by the designated individual on the CHM or platform.
- 2.11 Prior to authorizing crane operation, the designated individual must ensure all individuals on the CHM, working platform or crane are in a safe location and are aware of pending crane movement.
- 2.12 When using this procedure to move components without handling fuel, unnecessary steps may be marked “Not Applicable (N/A),” and minimum personnel requirements and required materials and equipment may be adjusted as appropriate for the evolution.
- 2.13 Any potential deficiencies, hazard, or abnormal condition noted during the performance of this procedure must be entered in Appendix B, and reported verbally to the FSV ISFSI Manager.
- 2.14 Fuel handling must not be allowed during a tornado watch or a tornado warning.
- 2.15 The crane must NOT be moved when personnel are attached to the fall arrest device on the crane hook.

3. PREREQUISITES

3.1 Planning and Coordination

Init/Date

- _____ 3.1.1 FSV ISFSI Manager: Ensure, as a minimum, the following personnel are available:
 - A. Certified Fuel Handlers (CFH) (3 for IV movement, 2 otherwise)
 - B. Radiological Control Technicians (RCT)/Radiation Control Monitors (RCM) (2)
 - C. Facility Safety Officer (FSO)
 - D. FSV ISFSI Manager.
- _____ 3.1.2 CFH: Ensure this procedure is the most current revision.

3.2 Performance Documents

- 3.2.1 Ensure the following forms are available for use in this procedure:
 - A. Form 434.14, “Pre-Job Briefing Checklist”
 - B. Form 434.15, “Pre-Job Briefing Attendance Record” (if used)

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- C. Form 433.24, “Task Evolution Feedback Form”
- D. Form 441.49, “ICP Radiation Work Permit” (if used)
- E. The signed off FHPA FSV #1.

3.3 Special Tools, Equipment, Parts, and Supplies

_____ 3.3.1 CFH: Ensure the following is done:

- A. The identification number and calibration due date for calibrated tools/test equipment, in the following table are recorded
- B. The material/equipment listed in the following table is available:

Material and Equipment List		
Item Description	Remarks	Quantity
Torque wrench capable of torquing to 200 ft lbs Upper range of torque wrench _____	S/N _____ Calibration Due Date _____	1
Temperature indicating device or temperature information (for example, NOAA)		
2-3/8-in. socket		
2-3/8-in. open-end wrench		
Breaker bar		
Leather gloves		
Moly-Kote lubricant or equivalent		
1/2-inch. Allen head socket		
Bucket/tray for bolts		
Ratchet and extension		
Flat blade screwdriver		
AMS-4 constant air monitor or equivalent (if required by the RWP)		
RO-20, Micro-rem meter, or equivalent radiation instrument		
177L count rate meter or equivalent		
Substantial footwear		
HEPA filter unit	S/N _____	

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Material and Equipment List		
Item Description	Remarks	Quantity
	DOP Test Due Date _____	
MVDS Crane	Inspection Due Date _____	
Sling No. 2	Inspection Due Date _____	
Sling No. 3	Inspection Due Date _____	
Sling No. 4	Inspection Due Date _____	
Fall protection harnesses	Inspection Due Date _____	A/R
Fall protection lanyards	Inspection Due Date _____	A/R
Fall protection fall arrest device	Inspection Due Date _____	A/R
Fall protection connector straps	Inspection Due Date _____	A/R

3.4 Training

3.4.1 Ensure the training requirements in Appendix C are met.

4. INSTRUCTIONS

NOTE 1: *Unless designated in front of step, a Certified Fuel Handler (CFH) is the person performing steps.*

NOTE 2: *Steps 4.1.1 through 4.1.15 may be performed in any order as directed by the job supervisor.*

4.1 Perform preoperational steps.

Init/Date

- _____ 4.1.1 FSV ISFSI Manager: Conduct a prejob briefing (use Form 434.14, “Pre-Job Briefing Checklist,” and Form 434.15, “Pre-Job Briefing Attendance Record,” if needed) with the operations personnel and complete the following items:
- A. A discussion of safety precautions and emergency actions
 - B. A review of Section 4 of this procedure
 - C. Assurance that training and qualification of personnel are current

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D. RCT coverage has been assigned to provide radiological control surveillance when needed during the performance of this procedure.

NOTE: *If storing a leaking FSC in an SSW, the FSV ISFSI Manager can require TPR-5598, "FSV ISFSI Storage Well O-Ring Leak Test," be performed.*

_____ 4.1.2 FSV ISFSI Manager: Designate whether leak test is required: yes _____ no _____ (FSV ISFSI Manager initial appropriate space). (SAR 9.2.4, Table 9.2-1)

_____ 4.1.3 FSV IFSI Manager: Designate the donor and recipient storage locations to be used for this evolution.

Donor: _____ Recipient: _____

_____ 4.1.4 FSV ISFSI Manager: IF handling an FSC containing spent fuel, THEN ensure the FSC has been sampled and/or purged per TPR-6493, to remove all flammable gasses. (SAR 5.1.1.1)

Date performed: _____

_____ 4.1.5 FSO: IF handling a leaking FSC, THEN ensure an RWP has been completed and is in place.

_____ 4.1.6 FSO: Inspect the work area and ensure that it is free of any hazards that would make completion of this procedure unsafe.

_____ 4.1.7 FSO: Check the FSV Fuel Inventory Operator Aid to ensure the recipient storage location is not loaded with an FSC.

WARNING

Performing HANDLING OPERATIONS when the ambient temperature has been less than 12°F for the 8 hours prior to handling an FSC containing fuel, could result in a brittle failure of the FSC seal and a release of radioactive material.

_____ 4.1.8 FSO: IF handling an FSC containing spent fuel, THEN record the lowest ambient air temperature for the previous 8-hour period (SR 3.3.2.1).

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Temperature: _____

NOTE: *The ISFSI Manager may approve proceeding to Step 4.2 because several hours may elapse before an FSC actually needs to be handled. A step to verify that the temperature has remained above 12°F is included before each FSC handling step.*

4.1.8.1 IF the ambient air temperature was less than or equal to 12°F during the previous 8 hour period, THEN obtain ISFSI Manager approval before proceeding to Step 4.2.

Signature: _____ Date: _____

_____ 4.1.9 FSO: Ensure TPR-6271, “FSV ISFSI Crane Hoist Limit Switch Functional Test,” has been completed (within 31 days prior to lifting the CHM and every 31 days during CHM lifting operations) (SR 3.2.2.2).

Date performed: _____ Date due: _____

_____ 4.1.10 FSO: Ensure TPR-5612, “Annual Inspection of the MVDS Crane and CHM Dead Stop Device,” has been completed (required every 12 months) (SR 3.2.2.1).

Date performed: _____ Date due: _____

_____ 4.1.11 FSO: IF handling an FSC containing spent fuel, THEN ensure the following procedures have been completed as needed:

_____ A. TPR-5605, “Inspection of FSV ISFSI Container Handling Machine Raise/Lower Mechanism” (required within 31 days prior to commencing HANDLING operations and every 31 days during HANDLING operations) (SR 3.2.1.1)

Date performed: _____ Date due: _____

_____ B. All CHM control interlocks have been tested by moving an FSC containing dummy fuel blocks from one storage location to another per TPR-5653 within 31 days prior to starting HANDLING operations and every 12 months during HANDLING operations (SR 3.2.1.2)

Date performed: _____ Date due: _____

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_____ C. TPR-6270, “FSV ISFSI CHM Load Cell” (required within 31 days prior to commencing HANDLING operations and every 12 months during HANDLING operations)

Date performed: _____ Date due: _____

4.1.12 FSO: Ensure TPR-5606, “Inspection of FSV ISFSI Isolation Valves and Shield Plug Handling Devices,” has been completed within 31 days prior to use and at intervals not to exceed every 12 months during use.

Date performed: _____ Date due: _____

4.1.13 FSO: Ensure TPR-5609, “Inspection of FSC Grapple,” has been completed within 31 days prior to use and at intervals not to exceed every 6 months during use.

Date performed: _____ Date due: _____

4.1.14 FSO: Ensure TPR-6270, “FSV ISFSI CHM Load Cell,” has been completed every 12 months during STORAGE operations.

Date performed: _____ Date due: _____

4.1.15 FSO: Ensure TPR-5602, “Inspection of FSV ISFSI Container Handling Machine Structure,” has been completed every 12 months during STORAGE operations.

Date performed: _____ Date due: _____

4.1.16 FSV ISFSI Manager: Verify that the prerequisites and preoperational Steps 4.1.1 through 4.1.15 have been satisfied.

_____ FSV ISFSI Manager _____ Date

_____ 4.1.16.1 Log the transfer procedure in the FSV Daily Operations Log and release it to commence work.

_____ 4.1.17 FSO: Ensure the Charge Face is posted as a “Control Area.”

4.2 Perform daily crane checks.

Init/Date

_____ 4.2.1 Ensure the crane disconnect located on south FSV ISFSI wall is ON.

_____ 4.2.2 Insert Key No. 1 into lock on crane control pendant and turn clockwise.

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- _____ 4.2.3 Press the POWER ON button on the crane control pendant.
- _____ 4.2.3.1 Visually ensure that the tornado clamps have released by observing the lamps on the crane pendant are extinguished.

_____ 4.2.4 Ensure the crane hook is at the upper datum.

NOTE: *Steps 4.2.5.1 through 4.2.5.4 may be performed concurrently with positioning the crane and attaching rigging and must be completed prior to lifting a load.*

- _____ 4.2.5 Perform daily check of the crane. (SAR 9.2.4, Table 9.2-1)
 - 4.2.5.1 Traverse the crane bridge north and south to ensure the bridge limits function.
 - 4.2.5.2 Traverse the crane trolley west and east to ensure the trolley limits function.
 - 4.2.5.3 Lower the crane hoist to the change of speed then raise the hook to ensure the motion limit and the upper datum (MVDS Crane hoist upper limit switch) function properly.
 - 4.2.5.4 Lower the crane hoist to eye level and inspect the hook and wire rope for obvious deficiencies.

NOTE: *Steps 4.3 through 4.9 may be worked in any sequence as designated by the job supervisor.*

4.3 IF the SSW lid needs to be removed,
THEN remove SSW lid.

Init/Date

NOTE: *Steps 4.3.1 through 4.3.5 may be worked out of sequence.*

- _____ 4.3.1 Attach Sling No. 4 to the crane hook.
- _____ 4.3.2 Traverse crane and Sling No. 4 and then align over SSW.
- _____ 4.3.3 Install the lifting eyebolts with links into the SSW lid and attach a tagline.
- _____ 4.3.4 Remove the SSW 1/2-in. Allen head lid bolts.
- _____ 4.3.5 Lower the crane hook with Sling No. 4 and attach the sling hooks (with hooks facing out) to the eyebolts on the lid.

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WARNING

The weight and configuration of the IVs make them difficult to control during tagging. Due to the combination of the potential tripping hazard of the charge face and the difficulty of IV tagging, if EXTREME CAUTION IS NOT EXERCISED WHEN TRAVERSING AN ISOLATION VALVE, injury to personnel could result.

- _____ 4.4.2 Ensure two tag lines and two riggers are available and used when traversing isolation valves.
- _____ 4.4.3 Install the lifting eyebolts with links to the IV and attach two tags lines.
- _____ 4.4.4 Remove the dust caps from bolt holes and from the shield plug-lifting hole at the recipient storage location.
 - 4.4.4.1 Install the two IV location pegs at the recipient storage location per the IV positioning and bolting pattern in Appendix A.

WARNING

If IV is removed before the Charge Face Shield Plug is installed, injury to personnel could result.

- _____ **NOTE:** *Steps 4.4.5 and 4.4.6 may be worked in any sequence as directed by the job supervisor.*
- _____ 4.4.5 Connect Sling No. 3 to the eyebolts.
- 4.4.6 Remove the IV bolts, if needed.
 - 4.4.6.1 First CFH (Performer): Remove all IV bolts.

Signature

Date

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4.4.6.2 Second CFH (Verifier): Verify (independent) all IV bolts have been removed.

Signature

Date

4.4.7 Traverse and align the IV at the recipient storage location.

4.4.7.1 Place valve mechanism of the IV ONLY in a southwest direction.

4.4.8 Lower the IV to the recipient storage location ensuring correct alignment on the location pegs.

NOTE: *Steps 4.4.9 through 4.4.14 may be worked in conjunction with Steps 4.5.1 through 4.5.5.*

4.4.9 Disconnect Sling No. 3 from the IV.

NOTE: *Steps 4.4.10 and 4.4.11 may be worked in any sequence as directed by the job supervisor.*

4.4.10 Remove eyebolts from the IV.

4.4.11 Inspect the IV bolts.

4.4.11.1 Clean and/or lubricate the threads and friction face of the IV bolts using “Moly Kote” or equivalent, if needed.

4.4.12 Bolt the IV at the recipient storage location.

4.4.13 Two CFH: Torque the IV bolts.

4.4.13.1 First CFH (Performer): Torque the IV bolts to 200 ft • lb with the exception of the short bolt located under the IV plunger (if used), per the IV positioning and bolting pattern in Appendix A.

Signature

Date

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4.4.13.2 Second CFH: Verify (witness) the specified IV bolts have been torqued to 200 ft • lb per the IV positioning and bolting pattern in Appendix A.

Signature

Date

_____ 4.4.14 Hand tighten the short bolt (if used).

4.5 Install IV at the donor storage location.

WARNING

The weight and configuration of the IVs make them difficult to control during tagging. Due to the combination of the potential tripping hazard of the charge face and the difficulty of IV tagging, if EXTREME CAUTION IS NOT EXERCISED WHEN TRAVERSING AN ISOLATION VALVE, injury to personnel could result.

NOTE: *Steps 4.5.1 through 4.5.5 may be worked out of sequence as directed by the Job Supervisor.*

_____ 4.5.1 Ensure two tag lines and two riggers are available and used when traversing isolation valves.

_____ 4.5.2 Install the lifting eyebolts with links to the IV and attach two tag lines to the IV.

_____ 4.5.3 Remove the dust covers from the bolts holes and the shield plug-lifting hole.

_____ 4.5.3.1 Install the two IV location pegs at the donor storage location per the IV positioning and bolting pattern in Appendix A.

_____ 4.5.4 IF needed, THEN remove the IV bolts.

4.5.4.1 First CFH (Performer): Remove all IV bolts.

Signature

Date

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4.5.4.2 Second CFH (Verifier): Verify (independent) all IV bolts have been removed.

Signature

Date

_____ 4.5.5 Position the crane above the IV to be placed at the donor storage location.

_____ 4.5.6 Attach Sling No. 3 to the lifting eyebolts.

_____ 4.5.7 Traverse and align the IV at the donor storage location.

_____ 4.5.7.1 Place the valve mechanism of the IV ONLY in a southwest direction.

_____ 4.5.8 Lower the IV to the donor storage location ensuring correct alignment on the location pegs.

NOTE: *Steps 4.5.9 through 4.5.14 may be worked concurrently with Steps 4.5.15 and 4.5.16.*

_____ 4.5.9 Disconnect Sling No. 3 from the eyebolts.

_____ 4.5.10 Traverse the crane to the sling laydown area.

_____ 4.5.11 Disconnect Sling No. 3 from the crane hook.

_____ 4.5.12 Remove eyebolts from the IV.

_____ 4.5.13 Inspect the IV bolts.

_____ 4.5.13.1 Clean and/or lubricate the threads and friction face of the IV bolts using “Moly Kote” or equivalent, if needed.

_____ 4.5.14 Bolt the IV at the donor storage location.

4.5.15 Two CFH: Torque the IV bolts.

4.5.15.1 First CFH (Performer): Torque the IV bolts to 200 ft • lb with the exception of the short bolt located at the IV plunger (if used), per the IV positioning and bolting pattern in Appendix A.

Signature

Date

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4.5.15.2 Second CFH: Verify (witness) the specified IV bolts have been torqued to 200 ft lbs per the IV positioning and bolting pattern in Appendix A.

Signature

Date

_____ 4.5.16 Hand tighten the short bolt (if used).

4.6 Install Shield Plug Handling Device (SPHD) 1 to IV at recipient storage location.

Init/Date

_____ 4.6.1 Connect Sling No. 2 to crane hook.

_____ 4.6.2 Connect fall arrest device to crane hook using connector strap as needed.

_____ 4.6.3 Traverse Sling No. 2 and fall arrest device to align with SPHD 1 located at its parked position.

_____ 4.6.4 Don fall protection equipment.

WARNING

Moving the crane when personnel are attached to the fall arrest device on the crane hook could result in personnel injury.

_____ 4.6.5 Do NOT move the crane when personnel are attached to the fall arrest device on the crane hook.

_____ 4.6.6 Connect fall arrest device to fall protection equipment.

_____ 4.6.7 Connect Sling No. 2 to SPHD 1.

_____ 4.6.8 Disconnect fall arrest device from fall protection equipment.

4.6.9 Doff fall protection equipment.

_____ 4.6.10 Traverse and align SPHD 1 at the IV positioned at the recipient storage location using a tag line.

_____ 4.6.11 Lower SPHD 1 to seat on the IV, ensuring correct alignment has been achieved using the locating pins.

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_____ 4.6.12 Rotate SPHD 1 clockwise by hand to engage the valve interlock, allowing the IV to be opened.

4.7 Open the IV and remove the shield plug at the recipient storage location.

Init/Date

_____ 4.7.1 Fully open the IV by the hand drive.

_____ 4.7.2 Remove the lifting pin from SPHD 1.

_____ 4.7.3 Lower the rod to engage on the shield plug.

_____ 4.7.4 Disconnect Sling No. 2 from SPHD 1.

NOTE: *Indication of proper lifting rod thread engagement is by the lifting rod traveling approximately the length of the wide red band.*

_____ 4.7.5 Screw the lifting rod into the shield plug.

_____ 4.7.6 Connect Sling No. 2 to SPHD 1.

NOTE: *Indications are given on the lifting rod to assist the operator to line up the lifting pin and avoid attempting to lift the complete SPHD off the IV prior to disconnecting the interlock.*

First a green band appears on the lifting rod indicating a further 6 in. of lift is required to align the lifting pin, second an orange band appears on the lifting rod indicating a further 3 in. of lift is required to align the lifting pin. The pin is aligned when the 1-in. plain band is exposed below the orange band. The appearance of a red band indicates that the lifting rod is being raised too high for location of the lifting pin.

_____ 4.7.7 Raise the lifting rod and shield plug into SPHD 1 to the 1-in. plain band.

_____ 4.7.8 Align the lifting pin holes and insert the lifting pin.

_____ 4.7.9 Fully close the IV by the hand drive.

_____ 4.7.10 Rotate SPHD 1 counter-clockwise to disengage the valve interlock.

_____ 4.7.11 Raise SPHD 1 to the crane upper datum.

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NOTE: *Step 4.7.12 and associated surveys may be performed concurrently with Steps 4.7.13 through 4.7.15.*

4.7.12 FSO: Request RCT/RCM perform radiation and contamination surveys of the top of the IV gate.

Signature Date

_____ 4.7.13 Ensure all personnel in the truck bay are wearing head protection (that is, hard hats).

NOTE 1: *The normal shield plug laydown position for this evolution is the receptacle at the CLUP.*

NOTE 2: *Steps 4.7.14 and 4.7.15 may be worked concurrently.*

_____ 4.7.14 Ensure the cover has been removed from the shield plug laydown position.

_____ 4.7.15 Traverse SPHD 1 to the shield plug laydown position using a tag line.

_____ 4.7.16 Lower SPHD 1 to seat.

4.8 Remove the shield plug from SPHD 1 and position SPHD 1 at the donor storage location.

Init/Date

_____ 4.8.1 Remove the lifting pin from SPHD 1.

_____ 4.8.2 Lower the shield plug to rest in its laydown position.

_____ 4.8.3 Disconnect Sling No. 2 from SPHD 1.

_____ 4.8.4 Fully unscrew the lifting rod from the shield plug.

_____ 4.8.5 Connect Sling No. 2 to SPHD 1.

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NOTE: *Indications are given on the lifting rod to assist the operator to line up the lifting pin.*

First a green band appears on the lifting rod indicating a further 6 in. of lift is required to align the lifting pin, second an orange band appears on the lifting rod indicating a further 3 in. of lift is required to align the lifting pin. The pin is aligned when the 1-in. plain band is exposed below the orange band. The appearance of a red band indicates that the lifting rod is being raised too high for location of the lifting pin.

- _____ 4.8.6 Raise the lifting rod into SPHD 1.
 - _____ 4.8.7 Align the lifting pin holes and insert the lifting pin.
 - _____ 4.8.8 Traverse SPHD 1 to the IV at the donor storage location using a tag line.
 - _____ 4.8.9 Lower SPHD 1 to seat on the IV ensuring correct alignment has been achieved using the locating pins.
 - _____ 4.8.10 Rotate SPHD 1 clockwise by hand to engage the valve interlock allowing the IV to be opened.
- 4.9 Open the IV at the donor storage location and remove the shield plug.

Init/Date

- _____ 4.9.1 Fully open the IV by the hand drive.
- _____ 4.9.2 Remove the lifting pin from SPHD 1.
- _____ 4.9.3 Lower rod to engage on the shield plug.
- _____ 4.9.4 Disconnect Sling No. 2 from SPHD 1.

NOTE: *Indication of proper lifting rod thread engagement is by the lifting rod traveling approximately the length of the wide red band.*

- _____ 4.9.5 Screw the lifting rod into the shield plug.
- _____ 4.9.6 Connect Sling No. 2 to SPHD 1.

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WARNING

Moving the crane when personnel are attached to the fall arrest device on the crane hook could result in personnel injury.

- _____ 4.9.16 Do NOT move the crane when personnel are attached to the fall arrest device on the crane hook.
- _____ 4.9.17 Connect fall arrest device to fall protection equipment.
- _____ 4.9.18 Disconnect Sling No. 2 from SPHD 1.
- _____ 4.9.19 Disconnect fall arrest device from fall protection equipment.
- _____ 4.9.20 Doff fall protection equipment.
- _____ 4.9.21 Disconnect Sling No. 2 and the fall arrest device from the crane hook at the sling laydown area.
- 4.10 Position the Container Handling Machine (CHM) at the donor storage location.

Init/Date

- _____ 4.10.1 Attach CHM to the crane, as follows:

WARNING

To attach the secondary seismic restraints will require an operator to leave the working platform and go out on the CHM. Failure to use approved fall protection gear when an operator leaves the working platform and goes out on the CHM to attach the secondary seismic restraints could result in injury or death.

NOTE: *The approved attachment points are the crane restraint rope thimbles.*

- _____ 4.10.1.1 Inspect fall protection equipment.
- _____ 4.10.1.2 Don fall protection equipment.

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NOTE: *During the alignment of the lifting pin, the crane may be moved slightly as needed, to assist the operator in inserting the lifting pin.*

- _____ 4.10.1.3 Align the crane hook with the CHM lifting pin.
- _____ 4.10.1.4 Using supplied speed wrench, hand drive the lifting pin into its fully inserted position through the crane hook.

WARNING

Not maintaining constant visual and verbal contact between the crane operator and person attaching the crane to the CHM, could result in injury to personnel from motion of the hoist block, lifting beam, or seismic restraints.

4.10.1.5 Crane Operator: While performing Steps 4.10.1.6 through 4.10.1.8, do the following:

- _____ 4.10.1.5.1 Maintain constant visual and verbal contact with the person on the CHM or working platform.
- _____ 4.10.1.5.2 Only operate the crane as directed by the person on the CHM while that person is connected to the crane, or on the working platform for access to the CHM.

NOTE: *During the attachment of the secondary seismic restraints, the crane may be moved slightly in the up or down motion as needed, to assist the operator in attaching the restraint chains.*

- _____ 4.10.1.6 Attach fall protection equipment to the crane restraint rope thimbles.
- _____ 4.10.1.7 Attach the secondary seismic restraints from the CHM top plate to the crane restraints ropes.
- _____ 4.10.1.8 Remove fall protection equipment from the crane restraint rope thimbles.

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_____ 4.10.1.9 Connect the crane electrical supply to the CHM using gloves.

NOTE: *Fall protection equipment may be doffed any time after completing step 4.10.2.*

_____ 4.10.2 Ensure all personnel are clear of the CHM top plate area.

_____ 4.10.3 Unbolt the CHM from the plinth.

4.10.3.1 First CFH (Performer): Remove all CHM bolts.

_____ Signature _____ Date

4.10.3.2 Second CFH (Verifier): Verify (independent) all CHM bolts have been removed.

_____ Signature _____ Date

_____ 4.10.4 Traverse the CHM and align the CHM to the IV at the donor storage location.

_____ 4.10.5 Rotate the CHM IV location pegs through 90 degrees and deploy to their lowered position.

_____ 4.10.6 Lower the CHM to seat on the IV ensuring correct alignment has been achieved using the location pegs.

_____ 4.10.7 Install the bolts for the CHM; bolt into position on the IV.

4.10.8 Two CFH: Torque the CHM bolts.

4.10.8.1 First CFH (Performer): Torque the CHM bolts to 200 ft • lb.

_____ Signature _____ Date

4.10.8.2 Second CFH: Verify (witness) CHM bolts have been torqued to 200 ft • lb.

_____ Signature _____ Date

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- _____ 4.10.9 FSO: Ensure the area adjacent to the CHM control panel is posted as an “At-the-Controls Area.”
- _____ 4.10.10 Connect the two electrical supply leads from the CHM to the grapple orientation plunger limit switches.
- _____ 4.10.11 Place the ICDT key into the ICDT lock on the left panel door and turn clockwise.
- _____ 4.10.12 Insert the ISFI-OPR key into emergency stop button lock, turn key clockwise and pull emergency stop button out.
- _____ 4.10.13 Remove the ISFI-OPR key from the emergency stop button.
- _____ 4.10.14 Turn ON/OFF/TEST switch on the CHM control panel to ON.
 - _____ 4.10.14.1 ACCEPT and RESET all alarms at the GENERAL panel.
- _____ 4.10.15 Press the LAMP TEST push-button at the GENERAL panel to ensure all lamps are functional.
- _____ 4.10.16 If necessary, move the IV handwheel slightly in the shut direction to obtain the CLOSED indication on ISOLATION VALVES panel.
- _____ 4.10.17 Ensure the following lamps are indicating ON:

DESIGNATED PANEL	
PANEL	LIGHT TO CHECK
RAISE/LOWER MECHANISM	UPPER DATUM
ISOLATION VALVES	CLOSED
GRAPPLE	FSC GRAPPLE FITTED FSC HANDLING JAWS LOCKED JAWS DISENGAGED
GENERAL	CHARGE FACE VALVE CONNECTED AT VAULT POWER

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_____ 4.10.18 Record the load indicated at the RAISE/LOWER MECHANISM panel for the empty FSC grapple at upper datum.

LOAD: _____

4.11 Open the CHM and IV at the donor storage location.

Init/Date

NOTE: *The following action isolates the crane from CHM operation.*

_____ 4.11.1 Push POWER OFF button on crane pendant and remove Key No. 1.

NOTE: *The following action withdraws the valve gate locking bolt. Key No. 1 is held in MVDS Key 1 Lock when the bolt is withdrawn.*

_____ 4.11.2 Insert and turn Key No. 1 counter-clockwise in MVDS Key 1 Lock at the CHM IV.

4.11.3 IF handling a leaking FSC,
THEN do the following:

_____ 4.11.3.1 Turn ON/OFF/TEST switch on the CONTAINER HANDLING MACHINE DISTRIBUTION PANEL (to the right of the CHM control panel) to ON.

_____ 4.11.3.2 Start the high-efficiency particulate air (HEPA) filter.

NOTE: *Lamp indication is given at the ISOLATION VALVES panel of the valve state. As the valve gate moves off its fully closed condition the CLOSED lamp will extinguish. The OPEN lamp will illuminate when the valve is fully open. The valve gate is to be driven until the internal valve gate stop prevents further movement.*

_____ 4.11.4 Open the CHM and CFS IVs.

_____ 4.11.5 Ensure that the CLOSED lamp extinguishes and the valve OPEN lamp illuminates at the ISOLATION VALVES panel.

NOTE: *The following action extends the valve gate locking bolt to lock the IV open and allows Key No. 2 to be removed.*

_____ 4.11.6 At the IV, turn Key No. 2 clockwise and remove Key No. 2.

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NOTE: *The following action enables CHM raise/lower operations. Once inserted and turned, Key No. 2 is only allowed to be removed when grapple is at upper datum.*

_____ 4.11.7 Insert Key No. 2 into MVDS Key 2 Switch at the ISOLATION VALVES panel and turn clockwise.

NOTE: *Both Key No. 2 and No. 3 must be inserted and turned clockwise at the CHM control panel to allow raise/lower mechanism operations.*

_____ 4.11.8 Insert Key No. 3 in MVDS Key 3 Switch at the RAISE/LOWER MECHANISM panel and turn clockwise.

4.12 Load FSC into the CHM at the donor storage location.

Init/Date

_____ 4.12.1 Lower the grapple to the insert grapple orientation plunger position by pressing the LOWER push-button on the RAISE/LOWER MECHANISM panel.

_____ 4.12.1.1 Ensure that the following indications are observed:

- A. UPPER DATUM lamp goes OFF
- B. LOWERING lamp comes ON
- C. When grapple stops then the LOWERING lamp goes OFF (RAISE/LOWER MECHANISM panel) and INSERT PLUNGER lamp comes ON (GENERAL panel).

NOTE: *The following action deploys the orientation plunger into the FSC grapple guide, the orientation of the grapple from this point is controlled.*

_____ 4.12.2 Withdraw the locking pin from the grapple orientation plunger.

_____ 4.12.2.1 Insert grapple orientation plunger, and lock plunger in the inserted position with locking pin.

_____ 4.12.2.2 Ensure INSERT PLUNGER lamp is OFF at GENERAL panel.

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_____ 4.12.3 Record the load indicated at the RAISE/LOWER MECHANISM panel for the FSC grapple located at the plunger insertion level.

LOAD: _____

NOTE 1: *Failure to hold the “LOWER” push-button depressed for a sufficient amount of time (approximately one second) may result in an overtorque trip of the Raise/Lower mechanism.*

NOTE 2: *The Raise/Lower mechanism may experience a momentary underload trip (the underload lamp may not illuminate) as the grapple contacts the FSC.*

_____ 4.12.4 Lower the grapple to seat on FSC lid and automatically engage FSC grapple jaws by pressing the LOWER push-button at the RAISE/LOWER MECHANISM panel.

_____ 4.12.4.1 Reset the overtorque trip as necessary and continue lowering the grapple.

_____ 4.12.4.2 Reset the underload trip as necessary and continue lowering the grapple until seated on the FSC.

_____ 4.12.4.3 Ensure that the following indications are observed:

- A. Lowering lamp comes ON (RAISE/LOWER MECHANISM panel)
- B. IN GRAPPLE RELEASE BAND lamp comes ON after approximately 40 seconds
- C. When grapple seats then:
 - 1. JAWS LOCKED lamp goes OFF (GRAPPLE panel)
 - 2. JAWS UNLOCKED lamp comes ON (GRAPPLE panel)
 - 3. GRAPPLE SEATED lamp comes ON (RAISE/LOWER MECHANISM panel)
 - 4. LOWERING lamp goes OFF (RAISE/LOWER MECHANISM panel)
 - 5. JAWS ENGAGED lamp comes ON (GRAPPLE panel)
 - 6. JAWS DISENGAGED lamp goes OFF (GRAPPLE panel).

_____ 4.12.5 Record the load indicated at the RAISE/LOWER MECHANISM panel for the FSC grapple seated on the FSC.

LOAD: _____

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NOTE 1: *The FSC grapple and FSC will raise, lock the grapple jaws and automatically stop at the grapple orientation plunger insertion level.*

NOTE 2: *Failure to hold the “RAISE” push-button depressed for a sufficient amount of time (approximately one second) may result in a trip of the Raise/Lower mechanism.*

_____ 4.12.8 Raise grapple and FSC to remove grapple orientation plunger by pressing the RAISE push-button at the RAISE/LOWER MECHANISM panel.

_____ 4.12.8.1 RESET any trips as necessary and continue raising the grapple.

- _____ 4.12.8.2 Ensure that the following indications are observed:
- A. RAISING lamp comes ON (RAISE/LOWER MECHANISM panel)
 - B. JAWS LOCKED lamp comes ON (GRAPPLE panel)
 - C. GRAPPLE SEATED lamp goes OFF (RAISE/LOWER MECHANISM panel)
 - D. JAWS UNLOCKED lamp goes OFF (GRAPPLE panel)
 - E. As grapple leaves the release band, IN GRAPPLE RELEASE BAND lamp goes OFF (GRAPPLE panel)
 - F. When grapple automatically stops, the RAISING lamp goes OFF (RAISE/LOWER MECHANISM panel) and the WITHDRAW PLUNGER lamp comes ON (GENERAL panel).

NOTE: *A loaded FSC should weigh approximately 3,550 lbs.*

_____ 4.12.9 Record the load indicated at the RAISE/LOWER MECHANISM panel for the FSC and FSC grapple at plunger insertion level.

LOAD: _____

_____ 4.12.10 Withdraw the locking pin from the grapple orientation plunger and withdraw the plunger.

_____ 4.12.10.1 Lock the plunger in its withdrawn position with the locking pin.

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_____ 4.12.10.2 Ensure that the WITHDRAWN PLUNGER lamp OFF is indicated at the GENERAL panel.

NOTE: *The FSC and FSC grapple will raise and automatically stop at upper datum.*

_____ 4.12.11 Raise grapple and FSC to CHM upper datum limit by pressing the RAISE push-button at the RAISE/LOWER MECHANISM panel.

_____ 4.12.11.1 Ensure that the following indications are observed:

- A. RAISING lamp comes ON (RAISE/LOWER MECHANISM panel)
- B. When grapple stops, then the UPPER DATUM lamp comes ON, and the RAISING lamp goes OFF.

_____ 4.12.12 Record the load indicated at the RAISE/LOWER MECHANISM panel for the FSC and FSC grapple at plunger upper datum level.

LOAD: _____

4.13 Close the CHM and IV at the donor storage location.

Init/Date

NOTE: *The following action isolates the Raise/Lower mechanism. The key release push-button will only release the key with the grapple at upper datum.*

_____ 4.13.1 While pressing the INTERLOCK KEY push-button on the ISOLATION VALVES panel, remove Key No. 2 from MVDS Key 2 Switch.

NOTE: *The following action withdraws the valve gate locking bolt.*

_____ 4.13.2 Insert Key No. 2 into MVDS Key 2 Lock on IV and turn counter-clockwise.

_____ 4.13.3 Close the CHM and CFS IVs.

_____ 4.13.3.1 Ensure that the following indications are observed on the ISOLATION VALVES panel:

- A. OPEN lamp goes OFF as valve gate moves off fully opened
- B. CLOSED lamp comes ON when valve fully closed.

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4.13.4 IF a leaking FSC was handled,
THEN do the following:

4.13.4.1 Turn off the HEPA filter.

4.13.4.2 Turn the ON/OFF/TEST switch on the CONTAINER HANDLING MACHINE DISTRIBUTION PANEL to OFF.

NOTE: *The following action extends the locking bolt and locks the valve gate in the closed position.*

4.13.5 Turn Key No. 1 clockwise and remove Key No. 1.

4.13.6 Disconnect the two electrical supply leads from the CHM to the grapple orientation plunger limit switches.

4.13.7 Ensure the CHARGE FACE VALVE CONNECTED lamp OFF at GENERAL panel.

4.13.8 Switch ON/OFF/TEST switch at CHM control panel to OFF.

4.13.9 IF the “At-the-Controls Area” posting at the CHM control panel needs to be removed to facilitate moving the CHM,
THEN remove it.

4.13.10 Unbolt the CHM from IV.

4.13.10.1 First CFH (Performer): Remove the CHM bolts.

Signature Date

4.13.10.2 Second CFH (Verifier): Verify (independent) CHM bolts have been removed.

Signature Date

4.13.11 Place Key No. 1 in MVDS Key 1 Switch on the crane pendant and turn the key clockwise for crane operation.

4.13.11.1 Turn crane power on.

4.13.12 Raise the CHM to the crane upper datum.

4.13.13 Withdraw the CHM location pegs and rotate to the raised position.

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4.14 Position the CHM at the Recipient Storage Location.

NOTE: *Step 4.14.1 and associated surveys may be performed concurrently with Step 4.14.2.*

4.14.1 FSO: Request RCT/RCM perform radiation and contamination surveys of the top of the donor storage location IV gate.

_____ : _____
Signature Date

_____ 4.14.2 Traverse the CHM and align with the IV (located at the recipient storage location).

_____ 4.14.3 Rotate the CHM IV location pegs through 90 degrees and deploy to their lowered position.

_____ 4.14.4 Lower the CHM and seat to the IV ensuring correct alignment has been achieved using the locating pegs.

_____ 4.14.5 Push POWER OFF button on crane pendant and remove Key No. 1.

_____ 4.14.6 Install the CHM bolts into position on the IV.

4.14.7 Two CFH: Torque the CHM bolts.

4.14.7.1 First CFH (Performer): Torque the CHM bolts to 200 ft • lb.

_____ Signature Date

4.14.7.2 Second CFH: Verify (witness) the CHM bolts have been torqued to 200 ft lbs.

_____ Signature Date

_____ 4.14.8 FSO: Ensure the area adjacent to the CHM control panel is posted as an “At-the-Controls Area”.

_____ 4.14.9 Connect the two electrical supply leads from the CHM to the grapple orientation plunger limit switches.

_____ 4.14.10 Switch the power supply ON at ON/OFF/TEST switch on the CHM control panel.

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- _____ 4.14.11 ACCEPT and RESET alarms on the CHM GENERAL panel.
- _____ 4.14.12 Press the LAMP TEST push-button at the GENERAL panel to ensure all lamps are functional.

NOTE: *It may be necessary to move the IV handwheel slightly in the shut direction to obtain the closed indication on the ISOLATION VALVES panel.*

- _____ 4.14.13 Ensure the following lamp indications on the CHM control panel are indicating ON:

DESIGNATED PANEL	
PANEL	LIGHT TO CHECK
RAISE/LOWER MECHANISM PANEL	UPPER DATUM
ISOLATION VALVES	CLOSED
GRAPPLE	FSC GRAPPLE FITTED FSC HANDLING JAWS LOCKED JAWS ENGAGED
GENERAL	CHARGE FACE VALVE CONNECTED AT VAULT POWER

- _____ 4.14.14 Record the load indicated at the RAISE/LOWER MECHANISM panel for the loaded FSC grapple at the upper datum.

LOAD: _____

- 4.15 Open the CHM and IV at the recipient storage location.

Init/Date

NOTE: *The following action withdraws the valve gate locking bolt. Key No. 1 is held in MVDS Key 1 Lock when the bolt is withdrawn.*

- _____ 4.15.1 Insert Key No. 1 in MVDS Key 1 Lock at the CHM IV and turn it counter-clockwise.

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WARNING

Performing HANDLING OPERATIONS when the ambient temperature has been less than or equal to 12°F anytime in the 8 hours prior to handling an FSC containing fuel, could result in a brittle failure of the FSC seal and a release of radioactive material.

_____ 4.16.2 FSC: IF handling an FSC containing spent fuel, THEN record the lowest ambient air temperature for the previous 8-hour period.

Temperature: _____

4.16.2.1 ISFSI Manager: IF the ambient (outside) air temperature was greater than 12°F during the previous 8-hour period, THEN Verify this condition. (SR 3.3.2.1)

_____ ISFSI Manager Signature _____ Date

4.16.2.2 FSC: IF the ambient air temperature was less than or equal to 12°F during the previous 8-hour period, THEN do the following:

_____ 4.16.2.2.1 Immediately place the FSC in a safe condition, but do NOT lower the FSC.

_____ 4.16.2.2.2 Suspend further HANDLING operations. (LCO 3.3.2 A)

NOTE 1: *The following action will cause the FSC and FSC grapple to lower and automatically stop at the grapple orientation plunger insertion level.*

NOTE 2: *Failure to hold the “LOWER” push-button depressed for a sufficient amount of time (approximately one second) may result in a trip of the Raise/Lower mechanism*

_____ 4.16.3 Press the LOWER push-button at the RAISE/LOWER MECHANISM panel.

_____ 4.16.3.1 Reset any trips as necessary and continue lowering the grapple.

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- _____ 4.16.3.2 Ensure that the following indications are observed:
- A. LOWERING lamp comes ON, UPPER DATUM lamp goes OFF (RAISE/LOWER MECHANISM panel)
 - B. When raise/lower mechanism stops the LOWERING lamp goes OFF RAISE/LOWER MECHANISM, and the INSERT PLUNGER lamp comes ON (GENERAL panel).

NOTE: *The following action deploys the orientation plunger into the FSC grapple guide. Orientation of the FSC grapple and FSC is controlled from this point.*

- _____ 4.16.4 Withdraw the locking pin from the grapple orientation plunger and insert the plunger.

- _____ 4.16.4.1 Lock the plunger in its inserted position with the locking pin.

- _____ 4.16.5 Ensure the INSERT PLUNGER lamp goes OFF (GENERAL panel).

- _____ 4.16.6 Record the load indicated at the RAISE/LOWER MECHANISM panel for the FSC and FSC grapple at plunger insertion level.

LOAD: _____

NOTE 1: *The following action will lower the FSC grapple and FSC, the FSC will seat, the grapple jaws will unlock automatically stopping the raise/lower mechanism.*

NOTE 2: *Failure to hold the “LOWER” push-button depressed for a sufficient amount of time may result in an overtorque trip of the Raise/Lower mechanism.*

NOTE 3: *The Raise/Lower mechanism may experience a momentary underload trip (the underload lamp may not illuminate) as the grapple contacts the FSC.*

- _____ 4.16.7 Press the LOWER push-button at the RAISE/LOWER MECHANISM panel.

- _____ 4.16.7.1 RESET the overtorque trip as necessary and continue lowering the grapple.

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- _____ 4.16.7.2 RESET the underload trip as necessary and continue lowering the grapple until seated on the FSC.
- _____ 4.16.7.3 Ensure that the following indications are observed:
- A. LOWERING lamp comes ON (RAISE/LOWER MECHANISM panel)
 - B. IN GRAPPLE RELEASE BAND lamp comes ON after approximately 40 seconds (GRAPPLE panel)
 - C. When the FSC seats the JAWS LOCKED lamp goes OFF (GRAPPLE panel), JAWS UNLOCKED lamp comes ON (GRAPPLE panel), LOWERING lamp comes OFF (RAISE/LOWER MECHANISM panel), and GRAPPLE SEATED lamp comes ON (RAISE/LOWER MECHANISM panel).
- _____ 4.16.8 Record the load indicated at the RAISE/LOWER MECHANISM panel for the FSC seated at the recipient storage location.
- LOAD: _____
- _____ 4.16.9 Press the DISENGAGE & RAISE push-button on the RAISE/LOWER MECHANISM panel.
- _____ 4.16.9.1 IF the weight of the raising grapple increases by more than 1000 lbs., THEN press the STOP push-button and inform the job supervisor.
- _____ 4.16.9.2 Ensure that the following indications are observed:
- A. JAWS ENGAGED lamp goes OFF (GRAPPLE panel)
 - B. JAWS DISENGAGED lamp comes ON (GRAPPLE panel)
 - C. RAISING LAMP comes ON (RAISE/LOWER MECHANISM panel)
 - D. JAWS LOCKED lamp comes ON (GRAPPLE panel)
 - E. GRAPPLE SEATED lamp goes OFF (RAISE/LOWER MECHANISM panel)

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- F. JAWS UNLOCKED lamp goes OFF (GRAPPLE panel)
- G. IN GRAPPLE RELEASE BAND lamp goes OFF (GRAPPLE panel)
- H. When the grapple stops at the plunger insertion level the RAISING lamp goes OFF (RAISE/LOWER MECHANISM panel), and the WITHDRAW PLUNGER lamp comes ON (GENERAL panel).

_____ 4.16.10 Record the load indicated at the RAISE/LOWER MECHANISM panel for the FSC grapple at the plunger insertion level.

LOAD: _____

_____ 4.16.11 Withdraw the locking pin from the grapple orientation plunger and withdraw the plunger.

_____ 4.16.11.1 Lock the plunger in its withdraw position with the locking pin.

_____ 4.16.12 Ensure the WITHDRAW PLUNGER lamp OFF at the GENERAL panel is indicated.

_____ 4.16.13 Press the RAISE push-button at the RAISE/LOWER MECHANISM panel.

_____ 4.16.13.1 Ensure that the following indications are observed on the RAISE/LOWER MECHANISM panel:

- A. RAISING lamp comes ON
- B. When the grapple stops the RAISING lamp goes OFF
- C. The UPPER DATUM lamp comes ON.

_____ 4.16.14 Record the load indicated at the RAISE/LOWER MECHANISM panel for the FSC grapple at upper datum.

LOAD: _____

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4.17 Close the CHM and IV at the recipient storage location.

Init/Date

NOTE: *The following action isolates the Raise/Lower mechanism. The key release push-button will only release the key with the grapple at upper datum.*

_____ 4.17.1 Press the INTERLOCK KEY push-button on the ISOLATION VALVE panel and remove Key No. 2 from MVDS Key 2 Switch.

NOTE: *The following action withdraws the valve gate locking bolt.*

_____ 4.17.2 Insert Key No. 2 into MVDS Key 2 Lock on IV and turn counter-clockwise.

_____ 4.17.3 Close the CHM and CFS IVs.

_____ 4.17.3.1 Ensure that the following indications are observed on the ISOLATION VALVES panel:

A. OPEN lamp goes OFF as valve gate moves off fully opened

B. CLOSED lamp comes ON when valve fully closed.

4.17.4 IF a HEPA filter was used (Step 4.15.2), THEN do the following:

_____ 4.17.4.1 Turn the HEPA filter OFF.

_____ 4.17.4.2 Turn the ON/OFF/TEST switch on the CONTAINER HANDLING MACHINE DISTRIBUTION PANEL to OFF.

NOTE: *The following action extends the locking bolt and locks the valve gate in the closed position.*

_____ 4.17.5 Turn Key No. 1 in MVDS Key 1 Lock clockwise, and then remove Key No. 1.

_____ 4.17.6 Disconnect the two electrical supply leads from the CHM to the grapple orientation plunger limit switches.

_____ 4.17.7 Ensure the CHARGE FACE VALVE CONNECTED lamp OFF is indicated at the GENERAL panel.

_____ 4.17.8 Switch ON/OFF/TEST switch at CHM control panel to OFF.

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_____ 4.17.9 Remove the following keys from the CHM control panel.

- A. ICDT
- B. Key No. 3 (RAISE/LOWER MECHANISM panel).

_____ 4.17.10 IF the “At-the-Controls Area” posting at the CHM control panel needs to be removed to facilitate moving the CHM, THEN remove it.

_____ 4.17.11 Unbolt the CHM from IV.

4.17.11.1 First CFH (Performer): Remove the CHM bolts.

Signature _____
 Date

4.17.11.2 Second CFH (Verifier): Verify (independent) CHM bolts have been removed.

Signature _____
 Date

_____ 4.17.12 Place Key No. 1 in Switch No. 1 on the crane pendant and turn the key clockwise for crane operation.

4.17.12.1 Turn crane power on.

_____ 4.17.13 Raise CHM to crane upper datum.

_____ 4.17.14 Withdraw CHM location pegs and rotate to the raised position.

NOTE: *Step 4.17.15 and associated surveys may be performed concurrently with Step 4.17.16.*

4.17.15 FSO: Request RCT/RCM to perform radiation and contamination surveys of the top of the IV gate.

Signature _____
 Date

_____ 4.17.16 Traverse the CHM and align the CHM with its parking plinth.

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NOTE: *It may be necessary to lower the CHM until the hold down bolts can be started to ensure proper alignment and then continue lowering the CHM. The Job Supervisor will direct this action.*

_____ 4.17.17 Lower the CHM until seated on the parking plinth.

NOTE: *Additional alignment may be required if the CHM was not aligned with bolt holes when seated.*

_____ 4.17.17.1 With the Job Supervisor directing, raise the CHM until it can be aligned with bolt holes, and repeat as necessary.

_____ 4.17.18 Install CHM bolts into the CHM and parking plinth.

_____ 4.17.18.1 Bolt the CHM to the parking plinth.

4.17.19 Two CFH: Torque the CHM bolts.

4.17.19.1 First CFH (Performer): Torque the CHM bolts to 200 ft lbs.

_____ Signature _____ Date _____

4.17.19.2 Second CFH: Verify (witness) CHM bolts have been torqued to 200 ft lbs.

_____ Signature _____ Date _____

_____ 4.17.20 Detach the CHM from the crane as follows:

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WARNING

To detach the secondary seismic restraints will require an operator to leave the working platform and go out on the CHM. Failure to use approved fall protection gear when an operator leaves the working platform and goes out on the CHM to detach the secondary seismic restraints could result in injury or death

NOTE: *The approved attachment points are the crane restraint rope thimbles.*

4.17.20.1 IF NOT already established,
THEN establish fall protection as follows:

_____ 4.17.20.1.1 Inspect fall protection equipment.

_____ 4.17.20.1.2 Don fall protection equipment.

WARNING

Not maintaining constant visual and verbal contact between the crane operator and person detaching the crane from the CHM could result in injury to personnel from motion of the hoist block, lifting beam, or seismic restraints.

4.17.20.2 Crane Operator: While performing Steps 4.17.20.3 and 4.17.20.6, do the following:

_____ 4.17.20.2.1 Maintain constant visual and verbal contact with the person on the CHM or working platform.

_____ 4.17.20.2.2 Only operate the crane as directed by the person on the CHM while that person is connected to the crane, or on the working platform for access to the CHM.

_____ 4.17.20.3 Disconnect the crane electrical supply from the CHM wearing leather gloves.

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- _____ 4.17.20.4 Attach fall protection equipment to the crane restraint rope thimbles.
- _____ 4.17.20.5 Detach the secondary seismic restraints from between the CHM top plate and the crane restraints ropes.
 - 4.17.20.5.1 IF the operator needs an assist in detaching the restraint chains,
THEN move the crane slightly in the up or down motion as needed.
- _____ 4.17.20.6 Disconnect fall protection equipment from the crane restraint rope thimbles.
- _____ 4.17.20.7 Using supplied speed wrench, hand drive the lifting pin into its retracted position from the crane hook.
 - 4.17.20.7.1 IF the operator needs an assist in retracting the lifting pin,
THEN move the crane slightly in the up or down motion as needed.
- NOTE:** *Fall protection equipment may doffed any time after completing step 4.17.20.8.*
- _____ 4.17.20.8 Ensure all personnel are clear of the CHM top plate area.

4.18 Install SPHD 1 to IV at the donor storage location.

Init/Date

- _____ 4.18.1 Connect Sling No. 2 and fall arrest device to the crane hook.
- _____ 4.18.2 Don fall protection equipment.

WARNING

Moving the crane when personnel are attached to the fall arrest device on the crane hook could result in personnel injury.

- _____ 4.18.3 Do NOT move the crane when personnel are attached to the fall arrest device on the crane hook.
- _____ 4.18.4 Connect fall arrest device to fall protection equipment.

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- _____ 4.18.5 Connect Sling No. 2 to SPHD 1.
- _____ 4.18.6 Disconnect fall arrest device from fall protection equipment.
- _____ 4.18.7 Doff fall protection equipment.
- _____ 4.18.8 Traverse and align SPHD 1 to the IV positioned at the donor storage location using a tag line.
- _____ 4.18.9 Lower SPHD 1 to seat on the IV ensuring correct alignment has been achieved using the locating pins.
- _____ 4.18.10 Rotate SPHD 1 clockwise by hand to engage the valve interlock allowing the IV to be opened.
- 4.19 Open the IV and install the shield plug at the donor storage location.

Init/Date

- _____ 4.19.1 Fully open the IV valve by the hand drive.
- _____ 4.19.2 Remove the lifting pin from SPHD 1.
- _____ 4.19.3 Lower the shield plug to seat in the donor storage location.
- _____ 4.19.4 Disconnect Sling No. 2 from SPHD 1.
- _____ 4.19.5 Unscrew the lifting rod from the shield plug.
- _____ 4.19.6 Connect Sling No. 2 to SPHD 1.

NOTE: *Indications are given on the lifting rod to assist the operator to line up the lifting pin and avoid attempting to lift the complete SPHD off the IV prior to disconnecting the interlock.*

First a green band appears on the lifting rod indicating a further 6-in. of lift is required to align the lifting pin, second an orange band appears on the lifting rod indicating a further 3-in. of lift is required to align the lifting pin. The pin is aligned when the 1-in. plain band is exposed below the orange band. The appearance of a red band indicates that the lifting rod is being raised too high for location of the lifting pin.

- _____ 4.19.7 Raise the lifting rod into SPHD 1 to the 1-in. plain band.
- _____ 4.19.7.1 Align the lifting pin holes and insert the lifting pin.
- _____ 4.19.8 Fully close the IV valve by the hand drive.

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- _____ 4.19.9 Rotate SPHD 1 counter-clockwise to disengage the valve interlock.
- 4.20 Install Shield Plug into SPHD1 and install to IV at the recipient storage location.

Init/Date

NOTE: *Step 4.20.1 and associated surveys may be performed concurrently with Step 4.20.2.*

4.20.1 FSO: Request RCT/RCM perform general area radiation and contamination surveys while lifting and initially traversing SPHD 1.

_____	_____
Signature	Date

- _____ 4.20.2 Traverse SPHD 1 to the shield plug laydown area using a tag line.
- _____ 4.20.3 Lower the SPHD 1 and align with the shield plug.
- _____ 4.20.4 Remove the lifting pin from SPHD 1.
- _____ 4.20.5 Lower the lifting rod to engage the shield plug.
- _____ 4.20.6 Disconnect Sling No. 2 from SPHD 1.

NOTE: *Indication of proper lifting rod thread engagement is by the lifting rod traveling approximately the length of the wide red band.*

- _____ 4.20.7 Fully screw the lifting rod into the shield plug.
- _____ 4.20.8 Connect Sling No. 2 to SPHD 1.

NOTE: *Indications are given on the lifting rod to assist the operator to line up the lifting pin. First a green band appears on the lifting rod indicating a further 6 in. of lift is required to align the lifting pin. Second, an orange band appears on the lifting rod indicating a further 3 in. of lift is required to align the lifting pin. The pin is aligned when the 1-in. plain band is exposed below the orange band. The appearance of a red band indicates that the lifting rod is being raised too high for location of the lifting pin.*

- _____ 4.20.9 Raise the lifting rod and shield plug into SPHD 1 to the 1-in. plain band.
- _____ 4.20.9.1 Align the lifting pin holes and insert the lifting pin.
- _____ 4.20.10 Traverse SPHD 1 to the recipient storage location using a tag line.

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- _____ 4.20.11 Lower SPHD 1 to seat on the IV, ensuring correct alignment has been achieved using the locating pins.
- _____ 4.20.12 Rotate SPFD 1 clockwise by hand to engage the valve interlock, allowing the IV to be opened.
- 4.21 Open the IV and install the shield plug at the recipient storage location.

Init/Date

- _____ 4.21.1 Fully open the IV.
- _____ 4.21.2 Remove the lifting pin from SPHD 1.
- _____ 4.21.3 Lower the shield plug to seat into the recipient storage location.
- _____ 4.21.4 Disconnect Sling No. 2 from SPHD 1.
- _____ 4.21.5 Fully unscrew the lifting rod from the shield plug.
- _____ 4.21.6 Connect Sling No. 2 to SPHD 1.

NOTE: *Indications are given on the lifting rod to assist the operator to line up the lifting pin and avoid attempting to lift the complete SPHD off the IV prior to disconnecting the interlock.*

First a green band appears on the lifting rod indicating a further 6 in. of lift is required to align the lifting pin, second an orange band appears on the lifting rod indicating a further 3 in. of lift is required to align the lifting pin. The pin is aligned when the 1-in. plain band is exposed below the orange band. The appearance of a red band indicates that the lifting rod is being raised too high for location of the lifting pin.

- _____ 4.21.7 Raise the lifting rod to the 1-in. plain band.
- _____ 4.21.7.1 Align the lifting pin holes and insert the lifting pin.
- _____ 4.21.8 Fully close the IV.
- _____ 4.21.9 Rotate SPHD 1 counter-clockwise to disengage the valve interlock.

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4.22 Remove the IV from the donor storage location.

Init/Date

NOTE: *Steps 4.22.1 through 4.22.4 may be worked out-of sequence as directed by the job supervisor.*

_____ 4.22.1 Align Sling No. 3 to the IV located at the donor storage location.

_____ 4.22.2 Install the IV eyebolts with links to the IV.

_____ 4.22.3 CFH: Unbolt the IV from the donor storage location.

4.22.3.1 First CFH (Performer): Remove the IV bolts.

Signature

Date

4.22.3.2 Second CFH (Verifier): Verify (independent) IV bolts have been removed.

Signature

Date

WARNING

The weight and configuration of the IVs make them difficult to control during tagging. Due to the combination of the potential tripping hazard of the charge face and the difficulty of IV tagging, if EXTREME CAUTION IS NOT EXERCISED WHEN TRAVERSING AN ISOLATION VALVE injury to personnel could result.

_____ 4.22.4 Ensure two tag lines and two riggers are available and used when traversing isolation valves.

_____ 4.22.5 Lower Sling No. 3 and connect to eyebolt links and attach two tag lines.

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4.25 IF the SSW lid needs to be installed,
THEN do the following:

Init/Date

NOTE: *Step 4.25.3 may be worked concurrently with Steps 4.25.1 and 4.25.2.*

_____ 4.25.1 IF a leaking FSC has been placed in the SSW,
THEN ensure the SSW lid O-rings have been installed per the applicable steps of TPR-5659 before proceeding.

_____ 4.25.2 Connect Sling No. 4 to the crane hook.

_____ 4.25.3 Align crane over nominated SSW lid laydown position.

_____ 4.25.4 Ensure the lifting eyebolts are installed into the SSW lid.

_____ 4.25.5 Attach the sling hooks to the eyebolts on the lid.

_____ 4.25.6 Traverse the crane and lid to the SSW.

NOTE 1: *To facilitate proper alignment of the lid bolt holes, the 1/2-in. Allen head bolts may be started prior to seating the SSW lid.*

NOTE 2: *The correct direction for alignment of the storage well lid leak check points are for the storage well leak check point – EAST and the seal interspace leak check point – SOUTH.*

_____ 4.25.7 Lower the SSW lid to seat on the SSW.

_____ 4.25.8 Remove Sling No. 4 from the SSW lid.

_____ 4.25.9 Raise Sling No. 4 to the crane upper datum.

_____ 4.25.10 Remove the lifting eyebolts from the SSW lid.

NOTE 1: *Steps 4.25.12 through 4.26.3 may be worked concurrently with the installation of the 1/2-in. Allen head bolts (Steps 4.25.11 and 4.25.12).*

NOTE 2: *SSW lid O-rings are installed as directed by supervision.*

_____ 4.25.11 IF lid O-rings are not installed
THEN hand-tighten lid bolts.

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- _____ 4.25.12 IF lid O-rings are installed,
THEN install the 1/2-in. Allen head bolts in the SSW lid per the applicable steps of TPR-5659.
- _____ 4.25.13 Remove Sling No. 4 from the crane hook at the sling laydown area.
- 4.26 Secure the crane.

Init/Date

- _____ 4.26.1 Traverse the crane as necessary to place the crane in standby.
- _____ 4.26.2 Secure power at the crane pendant.
 - _____ 4.26.2.1 Ensure the tornado clamps have engaged by observing that the lamps on the crane pendant illuminate.
- _____ 4.26.3 Remove Key No. 1 from crane pendant control.
- 4.27 **IF performing this procedure to satisfy Technical Specification 3.3.1, Action A.1.2.1, THEN complete a successful Storage Well leak test per TPR-5598 within 7 days of exceeding a seal leak rate limit. (TS 3.3.1, Action A.1.2.2)**
- 4.28 Perform the post-performance activities.

Init/Date

- 4.28.1 FSO: Do the following:
 - _____ 4.28.1.1 Review this technical procedure.
 - _____ 4.28.1.2 Update the inventory for the fuel placement
 - 4.28.1.3 FSO: Verify that the necessary deficiency recording documents and work performance documents to track and correct any deficiencies have been generated.
 - 4.28.1.4 Request all personnel signing or initialing steps in this procedure to complete the information in the table below:

Printed Name	S Number	Job Function	Initials	Signature

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Printed Name	S Number	Job Function	Initials	Signature

_____ Date

FSO Signature

4.28.2 FSV ISFSI Manager: Verify technical procedure completed.

_____ Date

FSV ISFSI Manager Signature

4.28.2.1 Document completion of technical procedure on FSV Operations Log.

5. RECORDS

Records package with completed copy of this procedure and all data sheets and recorded information pertaining to this procedure.

NOTE: *[MCP-557, "Records Management,"](#) the [INL Records Schedule Matrix](#), and associated [record types list\(s\)](#) provide current information on the storage, turnover, and retention requirements for these records.*

6. REFERENCES

FSV ISFSI Technical Specification, 3.3.2, "FSC Low Temperature"

GEC Technical Specification, 362F0154, "Operating Sequence"

GEC Technical Specification, 362F0350, "Tests After FSC Insertion at the SSW"

GEC Technical Specification, 362F0352, "FSC and SSW 'O' Ring Installation and Lid Bolt Torque Tightening"

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GEC Technical Specification, 362F0356, “Method of Leak Vacuum Testing Fuel Storage Container and Storage Well Tubes”

GEC Technical Specification, 36F0367, “FSV MVDS Integrated Commissioning and Functional Testing”

GEC Technical Specification, 362F0387, “Positioning and Securing of CFS Isolation Valve at the CFS CLUP, SSW and NSW”

General Electric Company (GEC) DWG. No. 362 A 0060 Standby Storage Well

Safety Analysis Report for the Fort St. Vrain Independent Spent Fuel Storage Installation, Section 5.1, “Storage System Operations”

RDP Electrosense Inc. Technical Manual for the E725 Microprocessor based Transducer

Indicator/Controller DC Input Version.

7. APPENDIXES

Appendix A, IV Positioning and Bolting Pattern

Appendix B, Procedure Discrepancies

Appendix C, Procedure Hazard Analysis

Appendix D, Procedure Basis

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Appendix A

IV Positioning and Bolting Pattern

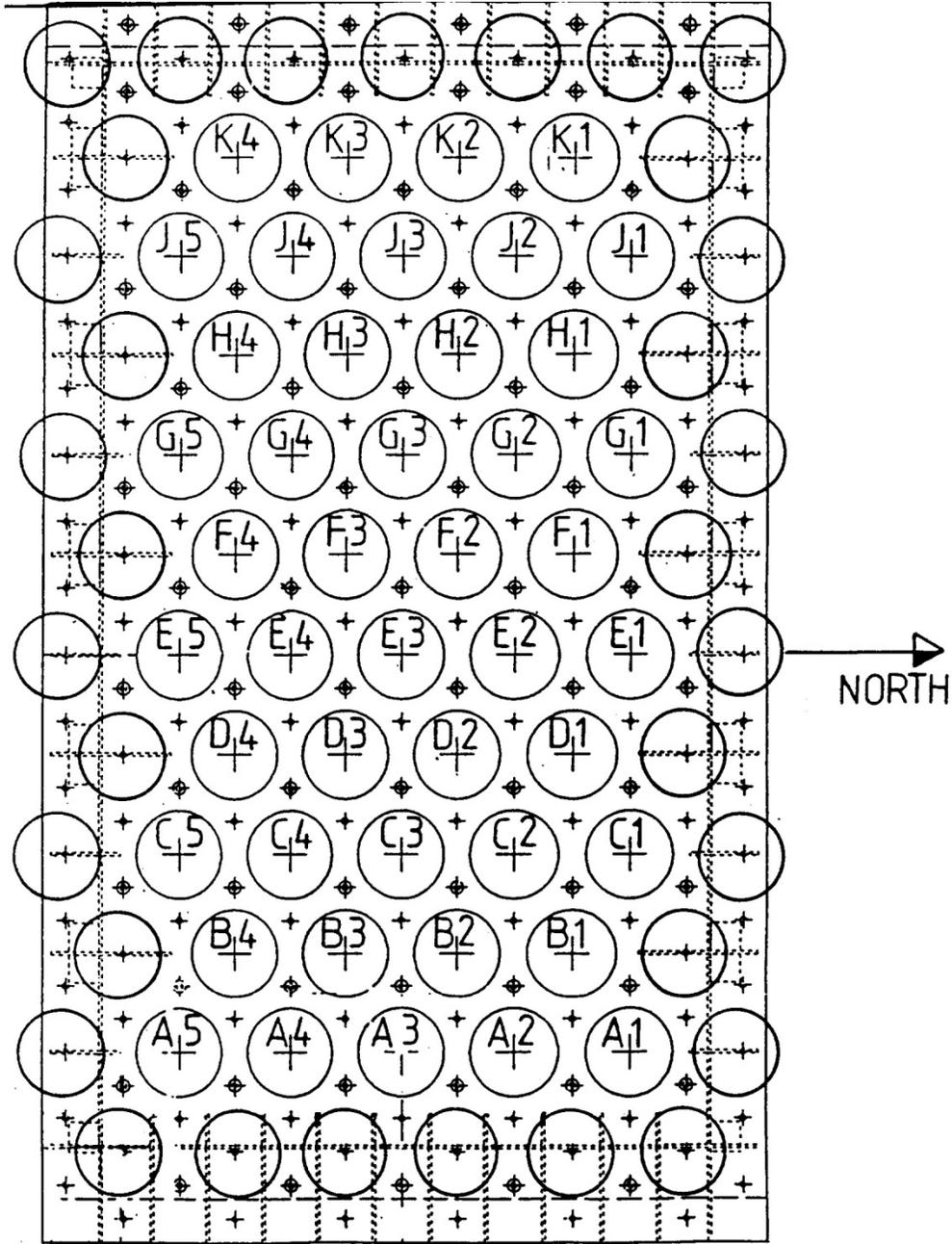


FIG 1 VM STORAGE LOCATIONS

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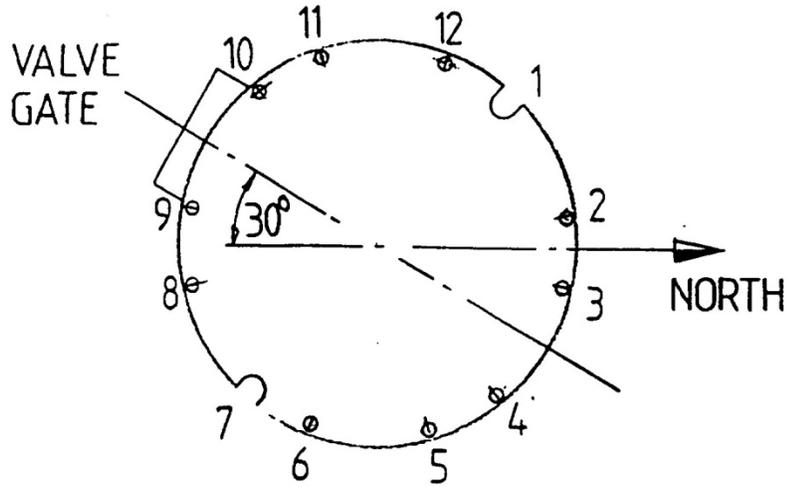


FIG2 VALVE -CFS BOLT LOCATION

VM STORAGE LOCATION	LOCATION AND BOLT	BOLT
A5.C5.E5.G5.J5.	1 AND 7	2,3,4,5,6,10,11,12.
K1.K2.K3.K4.	1 AND 7	2,3,4,5,6,8, 9,10.
ALL OTHER POSITIONS	1 AND 7	4,5,6,8,9,10,11,12.

TABLE 1 BOLTING PATTERN -CFS

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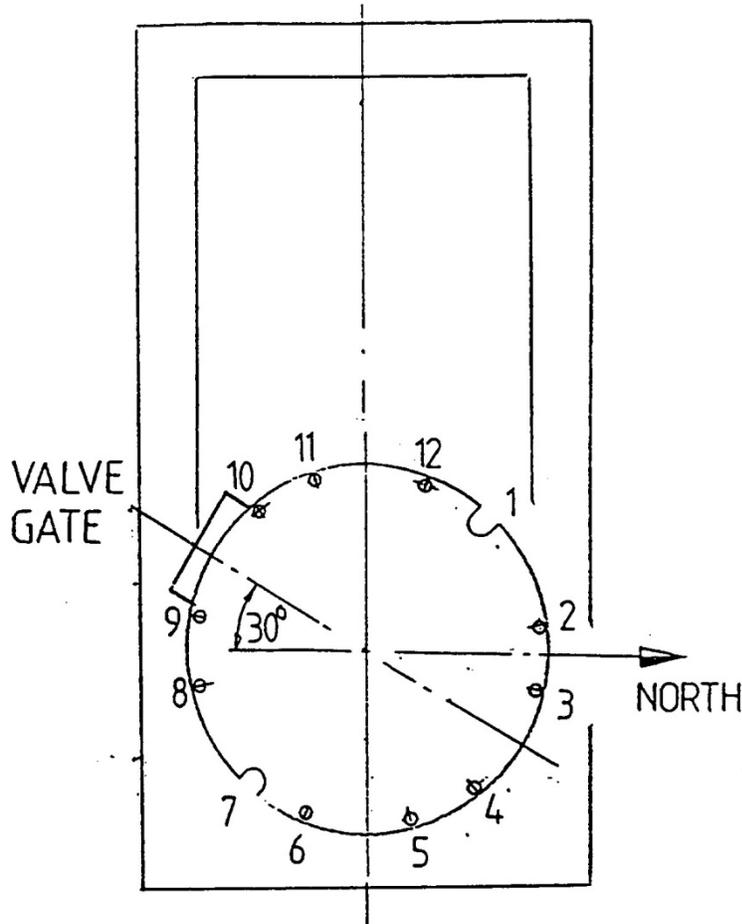


FIG 3 VALVE - CLUP BOLT LOCATION

POSITION	LOCATION	BOLT
CLUP	1 AND 7	2,3,4,5,6,8,9,10,11,12

TABLE 2 BOLTING PATTERN - CLUP

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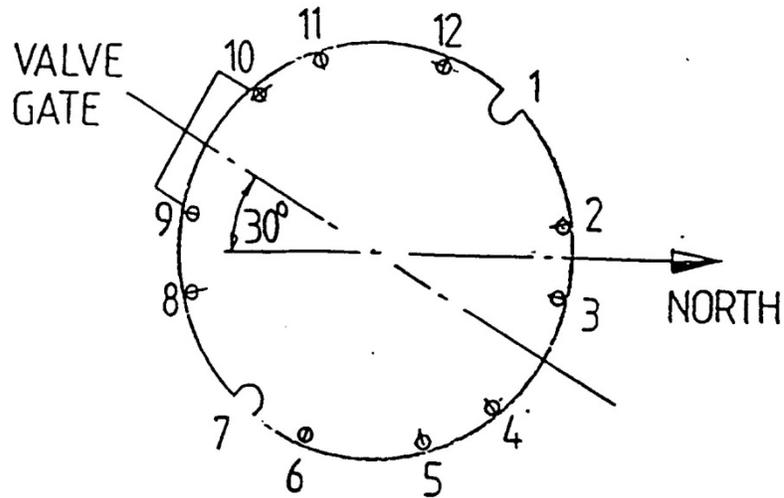


FIG 4 VALVE -SSW/NSW BOLT LOCATION

POSITION	LOCATION	BOLT
SSW/NSW	1 AND 7	2,3,4,5,6,8,9,10,11,12

TABLE 3 BOLTING PATTERN - SSW/NSW

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Appendix C

Procedure Hazard Analysis

Highly Hazardous Activity? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		HPSC No.: TPR-5653	
Disciplines (SMEs) involved in hazard analysis: (Checking the box indicates discipline is/was involved in the hazard analysis for the procedure.)			
	Discipline		Discipline
<input checked="" type="checkbox"/>	Industrial Safety	<input type="checkbox"/>	RCT/RAD Eng.
<input type="checkbox"/>	Industrial Hygiene	<input type="checkbox"/>	Env. Protection
<input type="checkbox"/>	Fire Protection	<input checked="" type="checkbox"/>	Quality Assurance
<input type="checkbox"/>		<input type="checkbox"/>	Engineering
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Operations
<input type="checkbox"/>		<input type="checkbox"/>	Other:
Required Job Training/Required Personal Protective Equipment			
Training		PPE	
Certified Fuel Handler		Substantial footwear	
Heat/cold stress		Appropriate gloves for operation with pinch points/chemicals	
Fall protection		Fall protection harness, fall arrest device, and connector strap	
RCT/RCM		Eye protection	

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE	
1. General to all procedure	1a. Unqualified operator, unsafe condition of crane	1a. Verify crane operator qualification and familiarity with operation of the crane.	
	1b. Crane failure	1b. Verify that testing and inspection of the crane has been performed per the requirements of PRD-650.	
	1c. Rigging failure	1c.1	Verify that testing and inspection of rigging has been performed per the requirements of PRD-650.
		1c.2	Maintain personnel clear of suspended loads.
		1c.3	Use tag lines and long handled tools as appropriate for positioning loads.
		1c.4	Ensure eyebolts are fully seated.
	1d. Exceeding rated capacity of crane	1d.1	Verify load is within the capacity of the crane.
		1d.2	Perform lifts in accordance with procedure requirements.

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Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
1. (continued)	1e. Radiation/contamination	1e.1 Verify radiological conditions with RCT/RCM prior to beginning work.
		1e.2 Follow requirements of RWP if applicable.
		1e.3 The HEPA must have a current DOP test date.
	1f. Pinch points	1f. Wear leather gloves for pinch points associated with rigging.
	1g. Uneven walking/working surface	1g.1 Personnel to be aware of tripping hazards that occur through design.
		1g.2 Operator to be aware of proper body position while working on the Charge Face.
		1g.3 Wear substantial footwear.
	1h. Fall from a ladder	1h.1 Maintain three points of contact while ascending or descending the ladder, raise or lower tools via a bucket or rope.
		1h.2 Visually inspect ladder prior to use.
		1h.3 Follow the requirements of FHPA FSV#1.
	1i. Heat Stress	1i. Monitor heat stress in accordance with MCP-2704.
	1j. Ergonomics	1j.1 Ensure proper body position, use proper lifting techniques while attaching/detaching rigging.
		1j.2 Applicable steps of MCP-2692 should be followed.
2. Removing or installing the SSW lid	See general hazards	See general hazards
3. Installing or removing IV at designated location	3a. Chemical exposure	3a.1 Wear powderless latex or nitrile gloves when lubricating components.
	3b. Low level waste	3b.1 Dispose of low-level waste per MCP-62, "Waste Generator Services-Low-Level Waste Management."

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Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
4. Installing or removing SPHD 1 to IV	4a. Fall hazard	4a.1 Ensure inspection tags for fall protection harness, fall arrest device, and connector strap are current.
		4a.2 The crane must <u>NOT</u> be moved when personnel are attached to the fall arrest device on the crane hook.
5. Opening the IV and removing the shield plug or installing the shield plug	5a. Fall hazard	5a.1 Ensure inspection tags for fall protection harness, fall arrest device, and connector strap are current.
		5a.2 The crane must <u>NOT</u> be moved when personnel are attached to the fall arrest device on the crane hook.
6. Positioning the CHM	6a. Fall hazard	6a.1 Ensure inspection tags for fall protection harness, fall arrest device, and lanyard are current
	6b. Personnel injury	6b.1 Maintain constant visual and verbal contact with person on the CHM or working platform.
		6b.2 Only operate the crane as directed by the person on the CHM or working platform.
7. Opening and closing the CHM and IV	See general hazards	See general hazards
8. Loading and unloading the FSC into and out of the CHM	See general hazards	See general hazards
9. Aligning the shield plug	See general hazards	See general hazards

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Appendix D

Procedure Basis

Procedure Review Table							
Review Discipline	Rev.	DFC Intent ^b Change	DFC Nonintent ^c Change	Review Discipline	Rev.	DFC Intent ^b Change	DFC Nonintent ^c Change
Operations Management	X ^a	X	X	Industrial Safety	X	X	X
Qualified Operator	X	X	X	Engineering			
Radiological Engineering				Industrial Hygiene			
Environmental				Other:			
Quality	X ^a	X	*				

a. X = review required.

b. Reviews for intent DFCs require the same discipline reviews required for a revision.

c. Reviews for nonintent DFCs can be performed with only Operations management and a qualified operator’s review and then implemented for immediate use. However, the remaining discipline reviews, as indicated by an asterisk (*), must be obtained within two (2) weeks. See MCP-2985, “Chapter XVI – Operations Procedures,” for definitions of intent and nonintent changes.

Step	Basis	Source	Citation
Entire procedure	Documents will be established and implemented to describe the planning and execution of inspections.	SAR, Section 9, Conduct of Operations GEC Technical Specification 362F0154, “Operating Sequence” GEC Technical Specification 362F0350, “Tests after FSC insertion at the SSW”	

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Step	Basis	Source	Citation
Entire procedure	Documents will be established and implemented to describe the planning and execution of inspections.	GEC Technical Specification 362F0352, “FSC and SSW ‘0’ Ring Installation and Lid Bolt Torque Tightening” GEC Technical Specification 362F0356, “Method of Leak Vacuum Testing Fuel Storage Container and Storage Well Tubes” GEC Technical Specification 362F0387, “Positioning and Securing of CFS Isolation Valve at the CFS, CLUP, SSW and NSW”	
2.1	Personnel must follow the applicable hazard mitigations detailed in Appendix B, “Procedure Hazard Analysis.”	Procedure hazard analysis	
2.2	All applicable Precautions and Limitations must be observed when handling individual components (such as Container Handling Machine).	Company policy	
Steps 2.3 and 3.4.1	Ensure compliance with Technical Specification.	FSV ISFSI Technical Specifications	3.3.2
2.3	FSCs containing spent fuel must not be handled if the ambient air temperature is less than or equal to 12°F per FSV ISFSI Technical Specification (TS) Limiting Condition for Operation (LCO) 3.3.2.	SR 3.3.2.1	

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Step	Basis	Source	Citation
2.4	An FSC containing spent fuel must not be handled, or its lid bolts removed, until a sample of the fuel storage atmosphere has been analyzed and determined not to contain a combustible gas mixture, or evacuated and purged with air to assure hydrogen concentrations are below flammable levels.	<i>Safety Analysis Report for the Fort St. Vrain Independent Spent Fuel Storage Installation</i>	5.1.1.1
2.5	If a Radiation Work Permit (RWP) is not required for this job and general area radiation levels exceed 2 mrem/hr or removable contamination levels (beta-gamma) exceed 1,000 dpm/100 cm ² (by smear), work must be stopped IMMEDIATELY, the incident investigated, and an RWP processed before proceeding.	RadCon requirement	
2.6	If the need arises to suspend operation (such as, for lunch, breaks, end of day, correct deficiency) before completion of the procedure, the following must be done: A. Steps necessary to secure the Container Handling Machine (CHM) and/or crane must be performed and annotated in the margin with signature and date B. When resuming work, the steps necessary to return the CHM and/or crane to operation (including daily crane checks if required) must be performed and annotated in the margin with signature and date.	Company policy	
2.7	Additional PPE must be indicated in the RWP if it is required.	Procedure hazard analysis	
2.8	The Container Handling Machine (CHM) must be fully operable during HANDLING OPERATIONS. In the event the CHM is not fully operable during HANDLING OPERATIONS, IMMEDIATELY place any contained spent fuel in the nearest safe storage location.	LCO 3.2.1	Action 3.2.1 A.1

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Step	Basis	Source	Citation
2.9	The MVDS Crane Hoist lift limits must be fully operable during STORAGE OPERATIONS and HANDLING OPERATIONS. In the event the MVDS Crane Hoist lifts the CHM above 3.5 in. during STORAGE OPERATIONS or HANDLING OPERATIONS, IMMEDIATELY lower the CHM to the floor.	LCO 3.2.1	Action 3.2.1 A.1
2.10	<p>If access to the working platform is needed, the individual(s) on the platform and the crane operator must be in constant visual or verbal contact. Crane operation must only be directed by the designated individual on the platform.</p> <p>Prior to authorizing crane operation, the designated individual will ensure all individuals on the working platform are in a safe location and are aware of pending crane movement.</p> <p>Maintain constant visual and verbal contact with the person(s) on the working platform.</p> <p>Only operate the crane as directed by the designated person on the working platform for access to the CHM.</p>	Procedure hazard analysis	
2.11	Prior to authorizing crane operation, the designated individual must ensure all individuals on the CHM, working platform or crane are in a safe location and are aware of pending crane movement.	Procedure hazard analysis	
2.12	When using this procedure to move components without handling fuel, unnecessary steps may be marked “Not Applicable (N/A),” and minimum personnel requirements and required materials and equipment may be adjusted as appropriate for the evolution.	Best management practice	

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Step	Basis	Source	Citation
2.13	Any potential deficiencies, hazard, or abnormal condition noted during the performance of this procedure must be entered in Appendix B, and reported verbally to the FSV ISFSI Manager.	Best management practice	
2.14	Fuel handling must not be allowed during a tornado watch or a tornado warning.	Best management practice	
2.15	The crane must <u>NOT</u> be moved when personnel are attached to the fall arrest device on the crane hook.	Procedure hazard analysis	
3.4.1	Ensure the training requirements in Appendix C are met:	Procedure Hazard Analysis	
4.1.2	Prior to storing a leaking FSC in an SSW, the FSV ISFSI Manager can require TPR-5598, “ISFSI Storage Well O-Ring Leak Test,” be performed. Method of leak test will be specified by the FSV ISFSI Manager.	SAR 9.2.4	Table 9.2-1
4.1.4	No FSC containing spent fuel will be handled or its lid bolts removed, until a sample of the fuel storage atmosphere has been analyzed and determined not to contain a combustible gas mixture, or evacuated and purged with air to assure hydrogen concentrations are below flammable levels.	(SAR 5.1.1.1)	
4.1.5	RWP will be issued as necessary	Procedure hazard analysis	
4.1.8	Within 8 hours of lifting an FSC containing spent fuel, the FSO must verify ambient (MVDS) temperature is greater than 12°F.	SR 3.3.2.1	
4.1.9	Ensure the following Technical Specification surveillance procedure has been completed as required: TPR-6271, “FSV ISFSI Crane Hoist Limit Switch Functional Test”; required within 31 days prior to lifting the CHM and every 31 days during CHM lifting operations.	SR 3.2.2.2	

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Step	Basis	Source	Citation
4.1.10	Ensure the following Technical Specification surveillance procedure has been completed as required: TPR-5612, “Annual Inspection of the MVDS Crane and CHM Dead Stop Device,” required every 12 months.	SR 3.2.2.1	
4.1.11	<p>If handling an FSC containing spent fuel blocks, ensure the following Technical Specification surveillance procedure has been completed as required: TPR-5605, “Inspection of FSV ISFSI Container Handling Machine Raise/Lower Mechanism,” required within 31 days prior to commencing HANDLING operations and every 31 days during HANDLING operations.</p> <p>If handling an FSC containing spent fuel , ensure the following Technical Specification surveillance procedure has been completed as required:</p> <p>B. All CHM control interlocks have been tested by moving an FSC containing dummy fuel blocks from one storage location to another per TPR-5653 within 31 days prior to commencing HANDLING operations and every 12 months during HANDLING operations.</p>	SR 3.2.1.1 SR 3.2.1.2	
4.1.12	<p>Ensure the following procedure has been completed as required: TPR-5606, “Inspection of FSV ISFSI Isolation Valves and Shield Plug Handling Devices,” required within 31 days prior to use and at intervals not to exceed every 12 months during use.</p> <p>Ensure the Isolation Valves and Shield Plug Handling Devices have been inspected prior to use.</p>	GEC Technical Specification 362F0152 Management decision	6.1.6

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Step	Basis	Source	Citation
4.1.13	Ensure the following procedure has been completed as required: TPR-5609, “Inspection of FSC Grapple,” required within 31 days prior to use and at intervals not to exceed every 6 months during use. Ensure the Grapple has been inspected prior to use	GEC Technical Specification 362F0152 Management decision	6.1.7.3
4.1.11 C, 4.1.14	Ensure the following procedure has been completed as required: TPR-6270, “FSV ISFSI CHM Load Cell,” required every 12 months during STORAGE and HANDLING operations and within 31 days of commencing HANDLING operations.	E725 Technical Manual	6.1-6.4, 6.10, and 9.3
4.1.15	Ensure the following procedure has been completed as required: TPR-5602, “Inspection of FSV ISFSI Container Handling Machine,” required every 12 months during STORAGE operations.	GEC Technical Specification 362F0152	6.1.7.1
4.1.17 4.10.9 4.13.9 4.14.8 4.17.10	These steps implement – FSV conduct of operations Chapter 3, Control Area Activities	MCP-2975 MCP-1077	
4.2.5	A Certified Fuel Handler must perform daily check of the crane.	SAR 9.2.4	Table 9.2-1
4.3	Remove SSW Lid	362F0367	6.4.34
4.4 4.5	Installation of the Isolation Valve	362F0367	6.4.16 6.4.35
*4.6 *4.8	Installation of SPHD 1 to the Isolation Valve.	362F0367	6.4.17 6.4.36
*4.7 *4.9	Opening the Isolation Valve and removal of the Shield Plug.	362F0367	6.4.18
*4.10 *4.14	Positioning of the CHM.	362F0367	6.4.26 6.4.38
*4.11 *4.15	Opening the CHM and CFS Isolation Valves.	362F0367	6.4.27 6.4.39

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Step	Basis	Source	Citation
*4.12	Loading the FSC into the CHM.	362F0367	6.4.30
4.12.7 4.16.2	A CFH must ensure the ambient air temperature is greater than 12°F immediately prior to loading the CHM.	SR 3.3.2.1	
*4.13	Closing the CHM and CFS isolation valves.	362F0367	6.4.31 6.4.42
*4.16	Lowering the FSC. Releasing the FSC grapple from the FSC and raising the empty FSC grapple to upper datum.	362F0367	6.4.28 6.4.29 6.4.41 6.4.40
*4.17	Closing the CHM and CFS isolation valves. Moving the CHM to its parking plinth.	362F0367	6.4.31 6.4.32
*4.18 *4.20	Installation of SPHD 1 to the Isolation valve.	362F0367	6.4.44
*4.19 *4.21	Opening the Isolation valve and insertion of the Shield Plug.	362F0367	6.4.45
4.22 4.23	Removal of the charge face isolation valve.	362F0367	6.4.46
4.27	Complete a successful storage well leak test per TPR-5598 within 7 days of exceeding a seal leak rate.	TS 3.3.1, Action A.1.2.2	

NOTE: *The information marked by an “*” is related to FSV ISFSI Technical Specifications 3.2 / LCO 3.2.1 / SR-3.2.1.2. The following shows the source of this information:*

- A. *GEC Specification 362 F 0357, FSV MVDS Works Erection, Commissioning and Functional Testing Specification, Section 4.3, Interlock Testing, states, “Full interlock testing will form part of the integrated commissioning and functional tests performed at site after initial erection is complete (see specification 362F0367).”*
- B. *GEC Specification 262 F 0367, FSV MVDS Integrated Commissioning and Functional Testing, Section 1.2, Object of Tests, states under Part 1.1.2, “To confirm the integrity of the installed interlock system.” Section 6.0, Integrated Functional Testing provides detailed test procedures that ensure that all equipment in the MVDS is functioning correctly for all operating modes and verify that the vault modules can be safely loaded and unloaded with FSCs. Therefore the requirement to “Functionally test the charge face isolation valves, the CHM isolation valve, and all CHM control interlocks”*

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(FSV SR-3.2.1.2) is satisfied by any combination of the Section 6.4, Test Procedures (6.4.1- 6.4.196) that demonstrate that a FSC can be transferred from any combination of locations i.e. vault to SSW, SSW to vault, vault to vault. Transfer of a FSC from any one location to another functionally tests the charge face isolation valves, the CHM isolation valve, and all CHM control interlocks as intended by this specification.

TPR-5653, Section 4, instruction steps marked with an asterisk in the above table has incorporated the corresponding cited GEC Specification 262 F 0367 test procedures and therefore fulfills SR-3.2.1.2 requirements.

Functional tests of interlocks associated with the IFE grapple and grapple exchange operations are not required to satisfy FSV SR-3.2.1.2. Applicability of LCO 3.2.1 is “During Handling Operations”. Per FSV Technical Specification definition, “Handling Operations includes all licensed activities on a FSC containing spent fuel while the FSC is not within an approved storage position within the MVDS.” The repackaging of fuel assemblies is not authorized by license number SNM-2504, License Condition 13. Therefore operations involving the IFE grapple are not currently licensed.