

FSV ISFSI CRANE HOIST LIMIT SWITCH FUNCTIONAL TEST	Identifier: TPR-6271 Revision*: 13 Page: 1 of 17
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INTEC	Technical Procedure	For Additional Info: http://EDMS	Effective Date: 07/18/13
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Manual: INTEC FSV3

USE TYPE 1Change Number: 129798, 339473

*The current revision can be verified on EDMS.

1. INTRODUCTION

1.1 Purpose

Verify the Container Handling Machine (CHM) lifting height as required by Technical Specification Limiting Condition for Operation (LCO) Number 3.2.2.

1.2 Scope and Applicability

This procedure specifies the actions necessary to perform a functional test of the crane hoist limit switch required by LCO 3.2.2, Technical Specification (TS) Surveillance Requirement (SR) Number 3.2.2.2 (Steps 4.1.1 through 4.1.3).

The crane hoist limit switch functional test is required within 31 days prior to lifting the CHM and at least once every 31 days during CHM lifting operations. The functional test is also performed after an “Off-Normal” event as described in the FSV ISFSI *Safety Analysis Report for the Fort St. Vrain Independent Spent Fuel Storage Installation*.

This procedure provides steps for measuring CHM lifting height, which is considered to be a best management practice prior to lifting a fuel storage container loaded with spent nuclear fuel (Steps 4.1.4 through 4.1.17).

2. PRECAUTIONS AND LIMITATIONS

- 2.1 Any deficiency, hazard, or abnormal condition noted during the performance of this procedure must be entered in Appendix A, and reported verbally to the FSV ISFSI Manager.
- 2.2 Personnel must follow the applicable hazard mitigations detailed in Appendix B, “Procedure Hazard Analysis.”

3. PREREQUISITES

3.1 Planning and Coordination

- 3.1.1 Ensure that as a minimum, two Certified Fuel Handlers (CFH) are present to perform this procedure.
- 3.1.2 Certified Fuel Handler: Check the revision number of this procedure to ensure it is the current issue.

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3.1.3 Ensure the training requirements in Appendix B are met.

3.2 Special Tools, Equipment, Parts, and Supplies

Item Description	Remarks	Quantity
Measuring device	1 ft minimum	
Molykote lubricant, or equivalent		
Torque wrench capable of torquing to 200 ft · lbs Upper range of torque wrench _____	S/N _____ Calibration Due Date _____	
Safety glasses		
Powderless latex or nitrile gloves		
Leather gloves		
MVDS Crane	Inspection due date _____	
2 3/8-in. socket (3/4-in. drive)		
1 1/8-in. wrench (socket or combination)		
1 1/2-in. wrenches (socket or combination) (2)		
Breaker bar		
Substantial footwear		
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

3.3 Approvals and Notifications

3.3.1 FSV ISFSI Manager: Check that the prerequisites have been completed.

3.3.1.1 Log the inspection procedure in the FSV Daily Operations Log and release it to start work.

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4. INSTRUCTIONS

NOTE 1: *Unless designated in front of step, a CFH is the person performing steps.*

NOTE 2: *Steps which do not need to be performed may be marked “N/A”*

4.1 Perform a functional test of the MVDS crane hoist limit switch (SR 3.2.2.2) (Steps 4.1.1 through 4.1.3), and perform a CHM lifting height measurement (Steps 4.1.4 through 4.1.17 as directed by the ISFSI Manager).

NOTE: *If the crane is already in use, only Step 4.1.3.3 needs to be performed to complete the surveillance. Steps 4.1.1, 4.1.2, 4.1.3.1, 4.1.3.2, and 4.1.3.4 may be marked “N/A” in this case.*

Initial

- _____ 4.1.1 Insert and turn key No. 1 in lock on crane pendant.
- _____ 4.1.2 Press the POWER ON button on the crane control pendant.
 - _____ 4.1.2.1 Ensure the tornado clamps indicating lamps are OFF.
- _____ 4.1.3 Perform daily check of the crane. (SAR 9.2.4, Table 9.2-1)
 - _____ 4.1.3.1 Traverse the crane bridge north and south to ensure the bridge limits function.
 - _____ 4.1.3.2 Traverse the crane trolley west and east to ensure the trolley limits function.
 - _____ 4.1.3.3 Lower the crane hoist to the change of speed then raise the hook to ensure the motion limit and the upper datum limit (MVDS Crane hoist limit switch) function. (SR 3.2.2.2)
 - _____ 4.1.3.4 Lower the crane hoist to eye level and inspect the hook and wire rope for obvious deficiencies.

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NOTE 1: Steps 4.1.4 through 4.1.17 are *NOT* required to complete the functional test of the MVDS Crane hoist limit switch required by LCO 3.2.2, Technical Specification (TS) Surveillance Requirement (SR) Number 3.2.2.2, and are performed at the discretion of the ISFSI Manager.

NOTE 2: If the CHM is already attached to the crane, Steps 4.1.4.1 through 4.1.5.2 may be marked "N/A".

_____ 4.1.4 Attach CHM to the crane, if directed by the ISFSI Manager:

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.*

_____ 4.1.4.1 Inspect fall protection equipment.

_____ 4.1.4.2 Don fall protection equipment.

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.*

_____ 4.1.4.3 Align the crane hook with the CHM lifting pin

_____ 4.1.4.4 Using supplied speed wrench, hand drive the lifting pin into its fully inserted position through the crane hook.

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.*

_____ 4.1.4.5 Attach fall protection equipment to the crane restraint rope thimbles.

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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.

- _____ 4.1.4.6 Crane Operator: While performing Steps 4.1.4.7 through 4.1.4.10, do the following:
- _____ 4.1.4.6.1 Maintain constant visual and verbal contact with the person on the CHM or working platform.
- _____ 4.1.4.6.2 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.
- _____ 4.1.4.7 Attach the secondary seismic restraints from the CHM top plate to the crane restraint ropes.
- _____ 4.1.4.7.1 IF the operator needs an assist in attaching the restraint ropes, THEN move the crane slightly in the up or down motion as needed.
- _____ 4.1.4.8 Disconnect fall protection equipment from the crane restraint rope thimbles.
- _____ 4.1.4.9 Connect the crane electrical supply to the CHM wearing leather gloves.
- _____ **NOTE:** *Fall protection equipment may be doffed any time after completing Step 4.1.4.10.*
- _____ 4.1.4.10 Ensure all personnel are clear of the CHM top plate area.

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_____ 4.1.5 Two CFH: Remove the bolts that attach the CHM to its storage pedestal.

4.1.5.1 First CFH (performer): Remove bolts attaching CHM to its storage pedestal.

Signature Date

4.1.5.2 Second CFH: Verify (independent) all bolts were removed.

Signature Date

_____ 4.1.6 Wearing powderless latex or nitrile gloves and safety glasses, lubricate the threads and friction face of the CHM bolts using “Molykote” or equivalent, as needed.

_____ 4.1.7 Raise the CHM to the crane upper limit.

4.1.8 Two CFH: Perform measurement.

4.1.8.1 First CFH (performer): Measure from the bottom of each CHM shock absorber leg to the charge face.

Southeast reading: _____

Southwest reading: _____

Northwest reading: _____

Northeast reading: _____

Signature Date

4.1.8.2 Second CFH (verifier): Measure from the bottom of each CHM shock absorber leg to the charge face.

Southeast reading: _____

Southwest reading: _____

Northwest reading: _____

Northeast reading: _____

Signature Date

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NOTE: *If all the measurements recorded in Step 4.1.8 are less than or equal to 3.5 inches, the FSV ISFSI crane upper limit is adjusted correctly and no action is necessary.*

4.1.9 IF any measurements recorded in Step 4.1.8 are greater than 3.5 inches, THEN do the following (FSV ISFSI crane upper limit **IS NOT** adjusted correctly):

_____ 4.1.9.1 Immediately lower the CHM to the floor (LCO 3.2.2).

_____ 4.1.9.2 Appropriate Engineering Support Personnel: Generate necessary deficiency recording documents and work performance documents to track and correct deficiencies.

_____ 4.1.9.3 CFH: Do the following:

_____ 4.1.9.3.1 Mark Steps 4.1.10, 4.1.11, and 4.1.12 N/A.

_____ 4.1.9.3.2 GO TO Step 4.1.13 and continue with procedure,
WITHOUT RETURNING TO this step.

_____ 4.1.10 Ensure bridge and trolley will move with CHM attached.

NOTE: *If continued CHM handling is intended, Steps 4.1.11 through 4.1.17 may be marked "N/A".*

_____ 4.1.11 Traverse the CHM and align the CHM with its parking plinth.

NOTE 1: *Additional alignment may be required if CHM was not aligned with bolt holes when seated.*

NOTE 2: *Steps 4.1.12 through 4.1.14 may be performed concurrently.*

_____ 4.1.12 Lower the CHM until seated on the parking plinth.

_____ 4.1.13 IF the hold down bolts can NOT be started to ensure proper alignment AND as directed by the Job Supervisor, THEN reposition the CHM until the hold down bolts can be started.

_____ 4.1.14 Install CHM bolts to the plinth.

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4.1.15 Two CFH: Torque the CHM bolts.

4.1.15.1 First CFH (performer): Do the following:

4.1.15.1.1 Verify the torque wrench is in calibration and is set at 200 ft • lb.

4.1.15.1.2 Torque the CHM bolts to 200 ft • lb.

Signature

Date

4.1.15.2 Second CFH: Verify (witness) the following:

A. The torque wrench was in calibration

B. It was set at 200 ft • lb

C. The CHM bolts were torqued to 200 ft • lb.

Signature

Date

4.1.16 Detach the CHM from the crane as follows:

_____ 4.1.16.1 Disconnect the crane electrical supply from the CHM wearing leather gloves.

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.*

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

_____ 4.1.16.2.1 Inspect fall protection equipment.

_____ 4.1.16.2.2 Don fall protection equipment.

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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.

4.1.16.3 Crane Operator: While performing Steps 4.1.16.4 through 4.1.16.8, do the following:

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

4.1.16.3.2 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.

4.1.16.4 Attach fall protection equipment to the crane restraint rope thimbles.

4.1.16.5 Detach the secondary seismic restraints from between the CHM top plate and the crane restraints ropes.

4.1.16.5.1 IF the operator needs an assist in detaching the restraint chains
THEN move the crane slightly in the up or down motion as needed.

4.1.16.6 Disconnect fall protection equipment from the crane restraint rope thimbles.

4.1.16.7 Using supplied speed wrench, hand drive the lifting pin into its fully retracted position from the crane hook.

4.1.16.7.1 IF the operator needs an assist in retracting the lifting pin,
THEN move the crane slightly as needed.

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NOTE: *Fall protection equipment may be doffed any time after completing Step 4.1.16.88.*

- _____ 4.1.16.8 Ensure all personnel are clear of the CHM top plate area.
- _____ 4.1.17 Position the crane as directed by the ISFSI Manager.

4.2 Performing Post-Performance Activities

4.2.1 Facility Safety Officer: Do the following:

- 4.2.1.1 Review the results of the procedure.
- 4.2.1.2 Using input from Appropriate Engineering Support Personnel, verify that the necessary deficiency recording documents and work performance documents to track and correct any deficiencies have been generated.
- 4.2.1.3 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

Facility Safety Officer: _____
Signature
Date

4.2.2 FSV ISFSI Manager: Do the following:

- 4.2.2.1 Verify procedure is complete.
- 4.2.2.2 Document completion of procedure on the FSV Daily Operations Log.

FSV ISFSI Manager: _____
Signature
Date

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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 NRC [record types list](#) provide current information on the storage, turnover, and retention requirements for these records.*

6. REFERENCES

FSV ISFSI Technical Specification 3.2.2

GEC Technical Specification, 362F0152, Fort St. Vrain Maintenance, Inspection and Monitoring Requirements

Safety Analysis Report for the Fort St. Vrain Independent Spent Fuel Storage Installation

Wazee Crane, Denver, Colorado, Drawings 1534-2636, 1535-2636, 1536-2636

7. APPENDIXES

Appendix A, Procedure Discrepancies

Appendix B, Procedure Hazard Analysis

Appendix C, Procedure Basis

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Appendix B

Procedure Hazard Analysis

Highly Hazardous Activity? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		HPSC No.: TPR-6271	
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"/>	Engineering
		<input checked="" type="checkbox"/>	Operations
		<input type="checkbox"/>	Other:
Required Job Training/Required Personal Protective Equipment			
Training		PPE	
Certified Fuel Handler		Substantial footwear	
Incidental Crane Operator		Appropriate gloves for operation with pinch points/chemicals	
Fall protection		Fall protection harness, fall arrest device, and connector strap	
Heat/cold stress		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.	
	1e. Pinch points	1e. Wear leather gloves for pinch points associated with rigging.	
	1f. Uneven walking/working surface	1f.1 Personnel to be aware of tripping hazards that occur through design.	
1f.2 Operator to be aware of proper body position while working on the Charge Face.			
1f.3 Wear substantial footwear.			
1g. Fall from a ladder	1g.1 Maintain three points of contact while ascending or descending the ladder, raise or lower tools via a bucket or rope.		

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Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
(1 continued)		1g.2 Visually inspect ladder prior to use.
		1g.3 Follow the requirements of the current FHPA.
	1h. Heat/cold Stress	1h. Monitor heat/cold stress in accordance with MCP-2704.
	1i. Ergonomics	1i.1 Ensure proper body position, use proper lifting techniques while attaching/detaching rigging.
1i.2 Applicable steps of MCP-2692 should be followed.		
2. Positioning the CHM	2a. Fall hazard	2a.1 Ensure inspection tags for fall protection harness, fall arrest device, and lanyard are current.
	2b Chemical exposure	2b.1 Wear powderless latex or nitrile gloves when lubricating components.
	2c. Personnel injury	2c.1 Maintain constant visual and verbal contact with person on the CHM or working platform.
		2c.2 Only operate the crane as directed by the person on the CHM or working platform.

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Appendix C

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	<i>Safety Analysis Report for the Fort St. Vrain Independent Spent Fuel Storage Installation, Section 9, Conduct of Operations, Part 9.4.1</i>	
Entire procedure	Written procedures shall be established, implemented, and maintained for routine operations and control of surveillances and tests.	Technical Specifications 5.4.1.b and 5.4.1.f	

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Step	Basis	Source	Citation
1.2	The crane hoist limit switch functional test is required within 31 days prior to lifting the CHM and at least once every 31 days during CHM lifting operations. The functional test is also performed after an “Off-Normal” event as described in the FSV ISFSI <i>Safety Analysis Report for the Fort St. Vrain Independent Spent Fuel Storage Installation</i> .	SR 3.2.2.2	
2.1	Any deficiency, hazard, or abnormal condition noted during the performance of this procedure must be entered in Appendix A, and reported verbally to the FSV ISFSI Manager.	Best management practice	
2.2	Personnel must follow the applicable hazard mitigations detailed in Appendix B, “Procedure Hazard Analysis.”	Procedure hazard analysis	
3.1.3	Ensure the training requirements in Appendix B are met.	Procedure hazard analysis	
4.1.1 through 4.1.3	The MVDS crane hoist limit switch must be functionally tested.	TS SR 3.2.2.2	
4.1.1 through 4.1.3	Satisfy Technical Specification Surveillance Requirements	FSV ISFSI Technical Specification Surveillance Requirement 3.2.2.2	
4.1.4.9	Connect the crane electrical supply to the CHM wearing leather gloves.	Procedure hazard analysis	
4.1.6	Wearing powderless latex or nitrile gloves and safety glasses, lubricate the threads and friction face of the CHM bolts using “Molykote” or equivalent, as needed.	Procedure hazard analysis	
4.1.9.1	Satisfy Technical Specification required action requirements	LCO 3.2.2	Action A.1

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Step	Basis	Source	Citation
4.1.16.1	Disconnect the crane electrical supply from the CHM wearing leather gloves.	Procedure hazard analysis	