1. INTRODUCTION

1.1 Purpose

Annual inspection of the Fort St. Vrain (FSV) Independent Spent Fuel Storage Installation (ISFSI) crane ensures a properly maintained, safely operating crane.

1.2 Scope and Applicability

This procedure specifies the actions necessary to perform an annual inspection of the Modular Vault Dry Store (MVDS) crane. Additionally, this procedure specifies the actions to visually inspect the MVDS crane hoist dead stop device every 12 months (SR 3.2.2.1) to ensure the MVDS crane hoist lift limits are operable during STORAGE OPERATIONS and HANDLING OPERATIONS. (LCO 3.2.2)

2. PRECAUTIONS AND LIMITATIONS

2.1 Any deficiency, hazard, or abnormal condition noted during the performance of this inspection procedure must be entered into Appendix A, "Inspection Deficiencies," and reported verbally to the FSV ISFSI Manager.

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

3. PREREQUISITES

3.1 Planning and Coordination

Initial/Date

_____ 3.1.1 FSV ISFSI Manager: Ensure as a minimum, the following personnel are available:

A. Facility Safety Officer (FSO)

B. Certified crane inspector (CI)

C. Quality inspector (QI) (level II or III) if NDT is to be performed.

_____ 3.1.2 ISFSI Manager: Conduct a pre-job 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 action associated with the conduct of this procedure.

B. A review of Step 4 of this procedure

C. Assure training and qualification of personnel are current

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

_____ 3.1.3 Facility Safety Officer (FSO): Ensure this procedure is the most current revision.

3.2 Performance Documents

3.2.1 ICP forms:

A. Form 434.14, "Pre-Job Briefing Checklist"

B. Form 434.15, "Pre-Job Briefing Attendance Record," (if used)

C. Form 433.24, "Task Evolution Feedback Form," (if used)

D. Form 441.49, "ICP Radiation Work Permit," (if used).

3.3 Special Tools, Equipment, Parts, and Supplies

_____ 3.3.1 CI: Ensure the following is available:

Material and Equipment List			
Item	Description	Remarks	Quantity
1	Fall protection equipment	Approved and inspected per PRD-5096, "Fall Protection"	As Required
2	Flashlight		1
3	Wire brush		1
4	Inspection mirror		1
5	NDT inspection equipment for Magnetic Particle Examination	Per ASTM E-709 if NDT is to be performed	(as necessary)

Material and Equipment List			
Item	Description	Remarks	Quantity
6	NDT inspection equipment for Liquid Penetrant Inspection	Per ASTM E-165 if NDT is to be performed	(as necessary)
7	Nitrile gloves for performance of liquid penetrant testing	If NDT is to be performed	1 pair

3.4 Training Requirements

3.4.1 Ensure the training requirements of Appendix C are met.

3.5 Approvals and Notifications

3.5.1 Ensure prerequisites have been completed.

3.5.1.1 Log the inspection procedure in the FSV Daily Operations Log and release it to commence work.

4. INSTRUCTIONS

NOTE: *Unless designated in front of step, certified Crane Inspector (CI) is person performing steps.*

4.1 Visually inspect the CHM dead stop device (SR 3.2.2.1).

NOTE: *Any visible cracks, deformation, or wear constitute an unsatisfactory inspection result.*

Initial/Date

_____ 4.1.1 Perform a visual inspection of the CHM dead stop device.

Sat: _____ Unsat:_____

_____ 4.1.2 IF a result is unsatisfactory,
THEN notify the FSV ISFSI Manager immediately of result.

_____ 4.1.3 Document any visible cracks, deformation, or wear in Appendix A, Crane Inspection Checklist.

4.2 Perform the annual inspection of the FSV ISFSI crane.

_____ 4.2.1 ISFSI Manager: Use a level 1 lockout/tagout to place the FSV ISFSI crane out of service.

4.2.1.1 Open the FSV ISFSI crane local disconnect switch located on the south wall of the FSV ISFSI.

4.2.1.2 Place personal lock and tag on the FSV ISFSI crane local disconnect switch located on the south wall of the FSV ISFSI.

_____ 4.2.2 ISFSI Manager: Insert and turn key No. 1 in lock on crane pendant.

4.2.2.1 Perform a zero energy check of the FSV ISFSI crane by pressing the POWER ON button on the crane pendant.

4.2.2.2 Attempt to operate the bridge, trolley, and hoist. (They should not operate.)

_____ 4.2.3 ISFSI Manager: Turn and remove key No. 1 from lock on crane pendant.

WARNING

Leaving the working platform could cause the inspector to fall and be injured.

_____ 4.2.3.1 CI: IF leaving the work platform,
THEN don fall protection gear and attach to an approved attachment point.

_____ 4.2.3.2 CI: Perform Sections A through Section D of Appendix A, Crane Inspection Checklist.

_____ 4.2.3.3 ISFSI Manager: Remove lockout/tagout from FSV ISFSI crane.

_____ 4.2.3.4 ISFSI Manager: Shut the FSV ISFSI crane local disconnect switch located on the south wall of the FSV ISFSI.

_____ 4.2.3.5 ISFSI Manager: Insert and turn key No. 1 in lock on crane pendant.

_____ 4.2.3.6 ISFSI Manager: Press the POWER ON button on the crane control pendant.

4.2.3.6.1 Ensure the tornado clamps indicating lamps are OFF.

_____ 4.2.3.7 CI: Perform Section E through Section H of Appendix A.

_____ 4.2.3.7.1 Inspector: IF performing liquid penetrant testing,
THEN don nitrile gloves.

_____ 4.2.3.7.2 Inspector: WHEN liquid penetrant testing is completed,
THEN doff nitrile gloves and dispose of waste generated in performance of NDT in accordance with MCP-62, "Waste Generator Services—Low-Level Waste Management."

_____ 4.2.3.8 ISFSI Manager: WHEN the annual inspection of the FSV ISFSI crane has been completed,
THEN ensure that any necessary information has been recorded on Appendix A.

_____ 4.2.3.9 ISFSI Manager: IF deficiencies are detected,
THEN initiate corrective maintenance.

_____ 4.2.3.10 CI: Position the FSV ISFSI crane as directed by the FSV ISFSI Manager.

_____ 4.2.3.11 ISFSI Manager: Press the OFF button on the crane control pendant.

4.2.3.11.1 Ensure the tornado clamps indicating lights illuminate.

_____ 4.2.3.12 ISFSI Manager: Turn and remove key No. 1 from lock on crane pendant.

4.3 Perform post-performance activities.

4.3.1 FSO: Do the following:

4.3.1.1 Review the results of the inspection checklist.

4.3.1.2 Generate necessary deficiency recording documents and work performance documents to track and correct any deficiencies.

4.3.1.3 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

4.3.2 FSV ISFSI Manager: Do the following.

4.3.2.1 Verify inspection procedure is complete.

FSV ISFSI Manager: _____ _____
Signature Date

4.3.2.2 Document completion of inspection procedure on the FSV Daily Operations Log.

5. RECORDS

Records package with completed copy of this procedure:

433.24, "Task Evolution Feedback Form," (if used)

434.14, "Pre-Job Briefing Checklist"

434.15, "Pre-Job Briefing Attendance Record," (if used)

441.49, "ICP Radiation Work Permit," (if used)

Field Changes (if any)

NOTE: *Records management requirements are described in MCP-557, "Managing Records". See Records Schedule Matrix – NRC Record Center (NRC Schedule Matrix) for information on uniform file code, disposition authority, and retention period.*

6. REFERENCES

GEC Dwg. No. 362 F 0152, "Fort St. Vrain Maintenance, Inspection and Monitoring Requirements"

FSV ISFSI Technical Specification 3.2.2

Manual 14A, *Safety and Health*, PRD-5096, "Fall Protection"

MCP-6503, "Inspection and Testing of Hoisting and Rigging Equipment"

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, Inspection Deficiencies

Appendix B, Crane Inspection Checklist

Appendix C, Procedure Hazard Analysis

Appendix D, Procedure Basis

Appendix A

Inspection Deficiencies

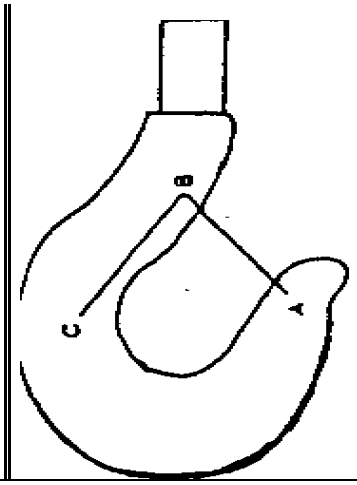
Step No. from Above	Condition	Corrective Action Required/Taken

Appendix B

Crane Inspection Checklist

Certified Crane Inspector (signature): _____ Inspection Date: _____

INSPECTION REQUIREMENTS	INSPECTION RESULTS (check one)			Initial
	NA	OK	Faulty	
A. BRIDGE and BRIDGE DRIVE INSPECTION REQUIREMENTS (Inspect for the following:)				
1. Deformed, cracked, or corroded members.				
2. Loose or missing bolts, rivets, nuts, or pins.				
3. Cracked or worn wheels.				
4. Worn, cracked, or distorted parts such as bumpers, stops, and drive shafts.				
5. Excessive wear on brake system parts (linings, pawls, latches, etc.).				
6. Handrails and foot walk for secure attachment and any deterioration.				
7. Warning labels in place.				
B. TROLLEY and TROLLEY DRIVE INSPECTION REQUIREMENTS (Inspect for the following:)				
1. Deformed, cracked, or corroded members.				
2. Loose or missing bolts, rivets, nuts, or pins.				
3. Cracked or worn wheels.				
4. Excessive wear on brake system parts (linings, pawls, latches, etc.).				
5. Worn, cracked, or twisted retaining devices.				
6. Warning labels in place.				
C. HOIST and HOIST DRIVE INSPECTION REQUIREMENTS (Inspect for the following:)				
1. Deformed, cracked, or corroded members.				
2. Loose or missing bolts, rivets, nuts, or pins.				
3. Cracked or worn sheaves and drums.				
4. Excessive wear on brake system parts (linings, pawls, latches, etc.)				
5. Worn, cracked, or twisted retaining devices.				
6. Warning labels in place.				
D. RUNWAY (rails, rail joints, rail fasteners, etc.) INSPECTION REQUIREMENTS (Inspect for the following:)				
1. Deformed, cracked, or corroded members.				
2. Loose or missing bolts, rivets, nuts, or pins.				
3. Worn, cracked, or twisted retaining devices.				
4. Warning labels in place.				

INSPECTION REQUIREMENTS	INSPECTION RESULTS (check one)			Initial
	NA	OK	Faulty	
E. HOIST WIRE ROPE INSPECTION REQUIREMENTS (Operate the hoist and perform an inspection, foot by foot, of the wire rope on the hoist. Examine the entire length of the wire rope. Inspect for the following:)				
1. Kinking, crushing, cutting, or unstranding of the wire rope.				
2. Cracked, deformed, or worn end attachments.				
3. Corrosion of the wire rope or end attachments.				
4. Ten random distributed broken wires in one rope lay or five broken wires in one strand in one rope lay.				
5. Loss of less than one-third the original outside diameter of the individual wire due to wear. Enter the original (new) diameter of the wire: .625 in. Enter the existing diameter of the wire: Calculate the amount of change in the wire: (original diameter - existing diameter)/original diameter = change				
F. HOIST HOOK and HOOK ATTACHMENT INSPECTION REQUIREMENTS (Inspect for the following:)				
1. Cracks, nicks, and gouges.				
2. Deformation—any bending or twisting from the plane of the unbent hook.				
3. Throat opening—any distortion causing an increase in throat opening exceeding 5% (compare as new/baseline measurements to existing measurements). Enter as new or baseline data: Date measurements were taken 10/08/97 Length AB 11.0 in. Length BC 11.0 in. Enter existing data: Date measurements were taken _____ Length AB _____ in. Length BC _____ in. 				
4. Damage from chemicals.				
5. Hook retaining nuts or collars and pins for cracks, deformation, excessive wear, and any other damage.				

INSPECTION REQUIREMENTS	INSPECTION RESULTS (check one)			Initial
	NA	OK	Faulty	
G. HOIST LOAD BLOCK INSPECTION REQUIREMENTS (Inspect for the following:)				
1. Cracked or worn sheaves.				
2. Worn sheave bearings and pins (without taking the load block apart for inspection).				
3. Loose sheave pins and missing retainers.				
4. Crack or worn block housing.				
H. FUNCTIONAL INSPECTION REQUIREMENTS (Operate the hoist, inspect for the following:)				
1. Control and operating mechanisms for proper operation.				
2. Hoist upper limit switch for proper operation.				
3. Hoist braking system for proper operation.				
4. Hoist rope for proper reeving on the drum and through the blocks and sheaves.				

Appendix C

Procedure Hazard Analysis

Highly Hazardous Activity? ☐ Yes ☒ No	**HPSC No.:** TPR-5612

Disciplines (SMEs) involved in hazard analysis: (Checking the box indicates discipline is/was involved in the hazard analysis for the procedure.)

	Discipline		Discipline		Discipline
☒	Industrial Safety	☐	RCT/RAD Eng.	☐	Engineering
☐	Industrial Hygiene	☐	Env. Protection	☒	Operations
☐	Fire Protection	☒	Quality Assurance	☐	Other:

Required Job Training/Required Personal Protective Equipment

Training	PPE
Certified Fuel Handler	Substantial footwear
Personal Protection Equipment	Appropriate gloves for operation with pinch points/chemicals
Fall protection (for at-risk workers)	Fall protection harness, fall arrest device, and connector strap
RCT/RCM	Eye protection
Ladder training (when using ladder)	
Lockout/tagout	
Scaffolding (if used)	

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
1. General to all procedure	1a. Unqualified operator, unsafe condition of crane	1a. Personnel must verify crane operator qualification and familiarity with operation of the crane.
	1b. Crane failure	1b. Personnel must verify that testing and inspection of the crane has been performed per the requirements of PRD-650.
	1f. Pinch points	1f. Personnel must 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 Personnel must wear substantial footwear.
	1h. Fall from a ladder	1h.1 Personnel must maintain three points of contact while ascending or descending the ladder, raise or lower tools via a bucket or rope.
		1h.2 Personnel must visually inspect ladder prior to use.
		1h.3 Personnel must follow the requirements of the current FSV FHPA.
	1i. Heat Stress	1i. Personnel must monitor heat stress in accordance with MCP-2704.

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
(1 continued)	1j. Ergonomics	1j.1 Personnel must ensure proper body position, use proper lifting techniques while attaching/detaching rigging.
		1j.2 Personnel must follow applicable steps of MCP-2692.
	1k. Exposure to chemicals	1k. Personnel must wear appropriate gloves and eye protection.

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.	DOE Hoisting and Rigging Manual	
2.1 Appendix B	Any deficiency, hazard, or abnormal condition noted during the performance of this inspection procedure must be entered into Appendix A, "Inspection Deficiencies," and reported verbally to the FSV ISFSI Manager. Appendix B must also include any actions taken as a result.	ICARE 105899	
2.2	Personnel must follow the applicable hazard mitigations detailed in Appendix C.	Procedure hazard analysis	
3.4.1	Ensure training requirements of Appendix B have been met.	Procedure hazard analysis	
4.1	Satisfy Technical Specification Surveillance	FSV ISFSI	

Step	Basis	Source	Citation
	Requirements.	Technical Specification Surveillance Requirement 3.2.2.1	
4.2.3.7.1	If performing liquid penetrant testing, the inspector must don nitrile gloves.	Procedure hazard analysis	
4.2.3.7.2	When liquid penetrant testing is complete, the inspector must dispose of waste generated in performance of NDT in accordance with MCP-62.	Procedure hazard analysis	