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March 11, 1993
Fort St. Vrain
Unit No. 1
P-93022

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Docket No. 50-267

SUBJECT: Licensee Event Report 93-002-00, Final Report

REFERENCE: Facility Operating License No. DPR-34

Gentlemen:

Enclosed is a copy of Licensee Event Report No. 50-267/93-002-00, Final, submitted per the requirements of 10 CFR 50.73(a)(2)(ii).

If you have any questions regarding this report, please contact Mr. M. H. Holmes at (303) 620-1701.

Sincerely,

Don W. Warembourg
Decommissioning Program Director

DWW/SWC

Enclosure

cc: Regional Administrator, Region IV

Mr. Ramon E. Hall, Director
Uranium Recovery Field Office

Mr. Robert M. Quillin, Director
Radiation Control Division
Colorado Department of Health

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Fort St. Vrain Unit No. 1										DOCKET NUMBER (2) 0 5 0 0 0 2 6 7				PAGE (3) 1 OF 0 7		
TITLE (4) Fuel Handling Machine in Unqualified Location																
EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)						
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES N/A				DOCKET NUMBER(S)			
0 2	1 0	9 3	9 3	0 0 2	0 0	0 3	1 1	9 3					0 5 0 0 0			
OPERATING MODE (9) N		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)														
POWER LEVEL (10) 0 0 0		20.402(b)				20.405(c)				50.73(a)(2)(iv)				72.71(b)		
		20.405(a)(1)(i)				50.36(c)(1)				50.73(a)(2)(v)				72.71(e)		
		20.405(a)(1)(ii)				50.36(c)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 365A)		
		20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(vii)(A)						
		20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(vii)(B)						
		20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(x)						
LICENSEE CONTACT FOR THIS LER (12)																
NAME M. H. Holmes, Project Assurance Manager										TELEPHONE NUMBER AREA CODE 3 0 3 6 2 0 - 1 7 0 1						
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC							
				N												
SUPPLEMENTAL REPORT EXPECTED (14)																
YES (If yes, complete EXPECTED SUBMISSION DATE)										X NO		EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On February 10, 1993, with the Fort St. Vrain reactor permanently shutdown and decommissioning actively in progress, the Fuel Handling Machine (FHM) was being used to remove radioactive core components from Equipment Storage Well No. 5. At approximately 11:30 a.m., the Reactor Building crane was detached from the FHM. Equipment Storage Well No. 5 is not a seismically qualified location for the FHM if it is not attached to the Reactor Building crane, so this action placed the plant in an unanalyzed condition.

This event occurred due to a misinterpretation of the applicable procedural requirements. After about 1 hour, the correct explanation of the procedural requirements was identified and the Reactor Building crane was re-attached to the FHM.

This event did not compromise decommissioning safety in that all safety barriers were maintained at all times. However, if a design basis earthquake had occurred, it is conceivable that the 165 ton FHM could have toppled and damaged the Reactor Building confinement or structural integrity.

PSC and its decommissioning contractor reviewed this event with all involved personnel and emphasized the need to prevent recurrence. Also, the applicable procedure was revised to strengthen FHM/crane attachment requirements.

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TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Fort St. Vrain Unit No. 1	DOCKET NUMBER (2) 0 5 0 0 0 2 6 7 9 3	LER NUMBER (6) <table border="1"><thead><tr><th>YEAR</th><th>SEQUENTIAL NUMBER</th><th>REVISION NUMBER</th></tr></thead><tbody><tr><td>—</td><td>0 0 2</td><td>— 0 0</td></tr></tbody></table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	—	0 0 2	— 0 0	PAGE (3) 0 2 OF 0 7
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							
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TEXT (If more space is required, use additional NRC Form 386A's) (17)

BACKGROUND:

The Fort St. Vrain Nuclear Station is being decommissioned in accordance with a Decommissioning Order issued November 23, 1992. This process includes the removal of all activated and radioactively contaminated core components and other material from within the Prestressed Concrete Reactor Vessel (PCRV) and affected systems.

The Fuel Handling Machine (FHM) was used to remove internal core components such as the region constraint devices, defueling elements, and various hexagonal reflector blocks. As shown in the attached figure, the FHM consists of a large gas-tight, shielded transfer cask that contains within it a circular storage rack and an extendable transfer mechanism. The transfer mechanism travels down into the PCRV, picks up the desired item, and carries it back into the shielded cask portion of the machine, where it is placed in a storage rack.

The FHM is over 45 feet tall and weighs approximately 165 tons. It can withstand a design basis seismic event without toppling if it is attached to the Reactor Building crane while sitting on a Reactor Isolation Valve or if it is bolted down in one of its seismically qualified locations. The Equipment Storage Wells are not seismically qualified locations for the FHM to be stored when it is not attached to the Reactor Building crane. The refueling floor, where the FHM operates, is the top floor of the Reactor Building. Any horizontal ground acceleration during a seismic event would be amplified at this elevation. In the event of an earthquake, it is conceivable that if the FHM is not properly anchored, it could topple and fall through the metal exterior walls of the Reactor Building, causing a breach of building integrity.

Reactor Building integrity is relied upon in several accidents analyzed in the FSV Decommissioning Plan, Section 3.4, involving handling of activated graphite blocks. The FSV Decommissioning Technical Specifications require Reactor Building integrity at all times when activated graphite blocks have been removed from the PCRV and remain within the Reactor Building.

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

EVENT DESCRIPTION:

On the morning of February 10, 1993, with the reactor permanently shutdown and decommissioning actively in progress, the FHM was being used to remove region constraint devices (RCDs) from Equipment Storage Well Number 5. RCDs had been stored in this well during the previous defueling process, and they were being transferred to a radioactive waste shipping liner for off-site disposal. The FHM also contained hexagonal graphite reflector blocks including hastelloy cans, that were being stored until a suitable shipping cask was available.

The Reactor Building crane is required for several top head decommissioning activities for which progress had stopped until the crane could be released from the FHM. The decommissioning contractor's Superintendent reviewed the applicable procedure, Work Package Number 2.3.1.8, "Hexagonal Core Component Removal With The Fuel Handling Machine," and determined (erroneously) that the Reactor Building crane could be disconnected from the FHM over the Equipment Storage Wells. At approximately 11:30 a.m. on February 10, 1993, the Reactor Building crane was disconnected from the Fuel Handling Machine. As noted above, the Equipment Storage Wells are not seismically qualified locations for the FHM if it is not connected to the Reactor Building crane.

About 1 hour later, after it was realized that the procedural requirements had been misinterpreted, the Reactor Building crane was re-attached to the FHM.

This event was evaluated and PSC determined that it placed the plant in an unanalyzed condition. PSC notified the NRC of this event in accordance with the requirements of 10 CFR 50.72(b)(2)(i), and this LER is submitted in accordance with the requirements of 10 CFR 50.73(a)(2)(ii).

ANALYSIS:

This event did not compromise decommissioning safety in that the Reactor Building confinement integrity was maintained at all times. Also, the FHM and Equipment Storage Well boundary was maintained at all times.

The likelihood of a design basis seismic event that may have challenged the stability of the FHM in this location was quite small for the 1 hour that this condition existed.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

However, had such an event occurred, it is conceivable that the FHM could have toppled, and either fallen through the Reactor Building exterior wall, or fallen in some other manner that, with its 165 ton weight, would have rendered the Reactor Building structural integrity indeterminate. The activated graphite blocks located within the Fuel Handling Machine may have been exposed during such a fall, that would have created a radiological hazard. Such a hazard could have been dealt with using portable shielding or other means to ensure protection of the health and safety of the public and workers.

A breach of the Reactor Building exterior wall would have required that all physical handling of activated graphite blocks be suspended until Reactor Building integrity could be restored.

CAUSE:

Detaching the Reactor Building crane from the FHM in an unqualified location on February 10, 1993, is attributed to human error in misinterpreting the requirements of the applicable procedure.

A contributing factor in the procedural misinterpretation is that, although the procedure did not list the Equipment Storage Wells as an allowable location to disconnect the Reactor Building crane, it did not have a specific precaution against disconnecting the crane in this location either.

Another contributing factor to the misinterpretation is that the licensing basis in the Decommissioning Plan is confusing. Decommissioning Plan Section 2.2.1.1 states that the Reactor Building will continue to be required to perform its confinement function following a seismic event. It also states that other than the Reactor Building, no additional seismic analysis of individual decommissioning tasks and removal activities will be required. This could be interpreted as saying that activities that do not physically affect the Reactor Building (e.g., that do not cut or weld to building structural steel or steel siding) need not be reviewed for seismic considerations.

A further confusion to personnel involved in detaching the crane is that other graphite block handling activities, such as loading and moving radiological waste casks, are not restricted for seismic considerations. These events have been analyzed and the consequences found acceptable, but this distinction was not apparent to the personnel involved.

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Cognizant PSC personnel involved in the event questioned the correctness of detaching the crane from the FHM, but largely because of the confusion in licensing basis requirements, they did not stop the job until further clarification could be obtained.

CORRECTIVE ACTION:

Within about 1 hour, the Reactor Building crane was re-attached to the FHM on Equipment Storage Well Number 5.

PSC and Westinghouse Team management reviewed the entire incident with the involved personnel, with emphasis on identifying the root cause, contributing factors, and corrective actions to prevent recurrence.

Field Superintendents were directed to discuss the event with their crews, and to document in the logs that the crane is to remain attached to the FHM at all times that the FHM is in a location that is not seismically qualified.

Letters were issued to all project personnel. PSC management explained the event to their personnel, reminded them of the stop work authority policy, and emphasized that PSC's oversight role is to question the safety and appropriateness of activities and to seek clarification of conditions that are not well defined or understood, prior to performance of the activity. The Westinghouse Team management emphasized to their personnel the need to be aware of safety concerns (both personal and radiation) and regulatory compliance requirements. The Westinghouse Team also held meetings with all of their employees to stress the importance of these issues.

The applicable procedure, Work Package 2.3.1.8, "Hexagonal Core Component Removal With The Fuel Handling Machine," was revised to clarify the only qualified locations for the Reactor Building crane to be detached from the FHM and the Auxiliary Transfer Cask, and to add suitable precautions.

Westinghouse Team management and engineers attended refresher training in pertinent aspects of the Decommissioning Plan, including licensing requirements, seismic requirements, and other considerations. This will be an ongoing progressive effort to provide refresher training and emphasize licensing basis concerns before applicable tasks are undertaken.

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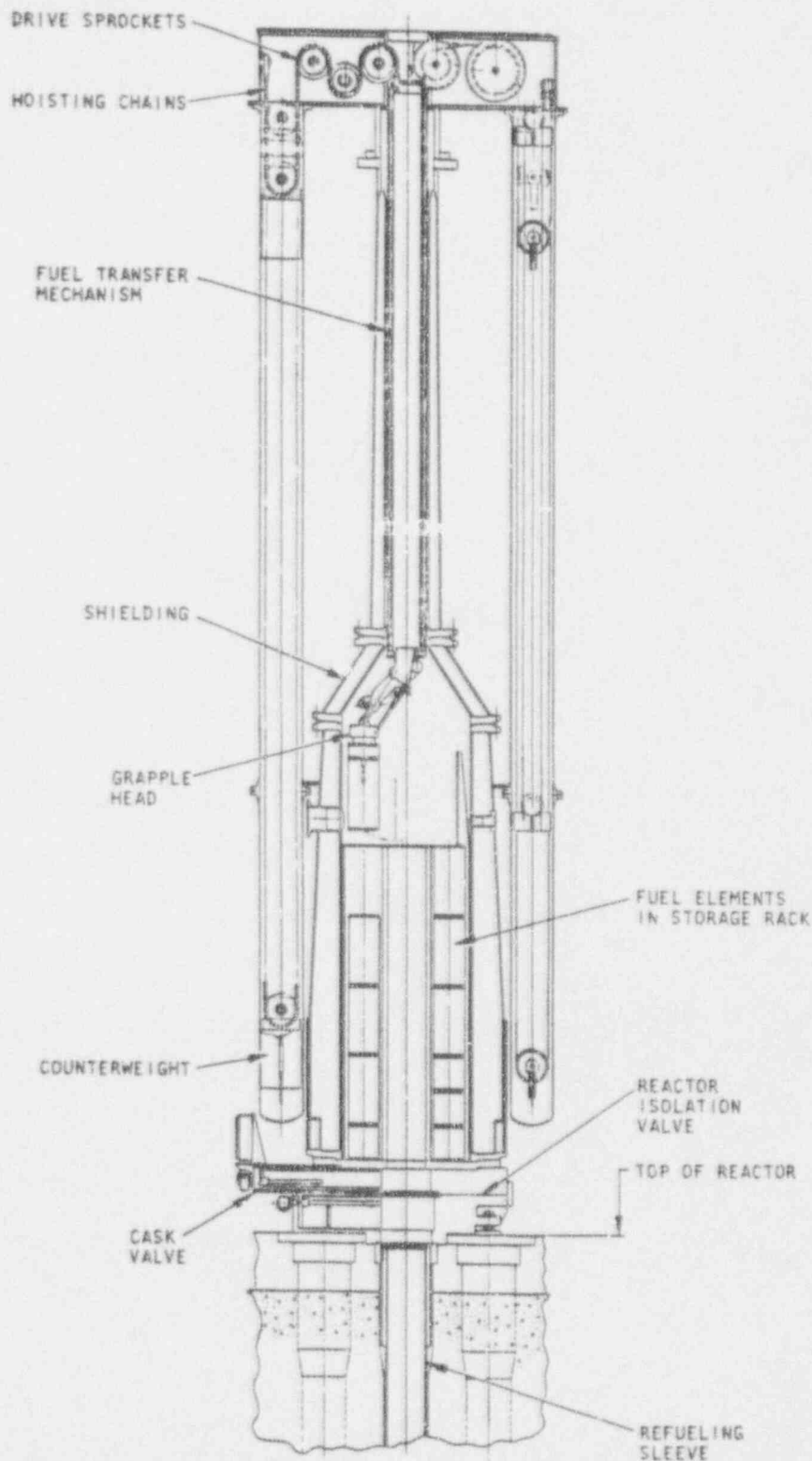
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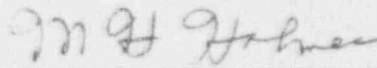
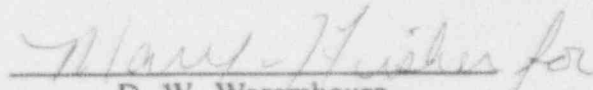
FUEL HANDLING MACHINE

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TEXT (If more space is required, use additional NRC Form 305A's) (17)

S. W. Chesnutt
Project AssuranceM. H. Holmes
Manager, Project AssuranceD. W. Warembourg
Decommissioning Program Director