

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

November 4, 1992

NRC INFORMATION NOTICE 92-73: REMOVAL OF A FUEL ELEMENT FROM A RESEARCH
REACTOR CORE WHILE CRITICAL

Addressees

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert licensees to a recent event in which licensed operators at a research reactor inadvertently removed a fuel element from a reactor core that was critical. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

On June 8, 1992, at the University of Michigan's (the licensee's) Ford research nuclear reactor facility the Assistant Reactor Manager for Operations (ARM) and two other senior reactor operators (SROs) were conducting tests to measure changes in core reactivity. In each test, the operators would perform the following: move the fuel, bring the reactor to low power, collect data, and shut down the reactor. After collecting data following the third fuel movement, and with the reactor still critical at low power (8 kW), the ARM directed the two SROs to move the fuel a fourth time. The SRO acting as the control room operator then informed the ARM that the 2-hour control room log readings were due. The ARM then gave the SROs instructions on what to do while he obtained the log readings. The ARM subsequently told the NRC that he instructed the SROs to prepare for the fourth move; however, the SROs believed that they had clear direction to move fuel. The SROs then began moving the fuel. While one SRO monitored the test, the other latched a fuel element with the fuel handling tool, and then removed the fuel element. The research reactor immediately went subcritical and the control rod's servo-mechanism switched out of automatic control. At that time, another SRO not directly involved in the fuel movement, but recognizing what had happened, entered the control room and manually inserted the shim rods and control rod. The equipment performed as designed and the reactor remained in a safe condition.

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Discussion

As discussed in NRC's Augmented Inspection Team (AIT) Report No. 50-002/92001, dated July 9, 1992, and associated correspondence, several factors led to this event.

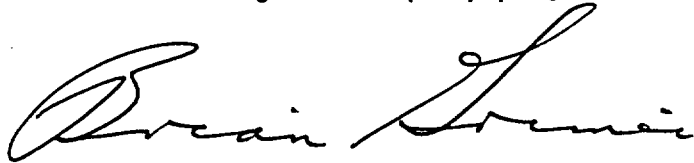
1. There was frequent informal turnover of control room responsibilities between the ARM and the control room operator during the fuel movements. Who was to have overall control of the reactor between the third and fourth fuel movements was not clearly established.
2. The ARM and the other two SROs moving the fuel did not communicate well. For example, both SROs believed that they had clear instructions to move the fuel, while the ARM believed that he only instructed them to prepare to move fuel. An intercom system between the control room and the fuel handling bridge was not used until the fuel element was being moved.
3. Relying on their experience and the routine nature of the fuel moves, the SROs did not use or review the procedures that applied to moving fuel either before or during the actions to move the fuel.
4. An excessive work load may have contributed to the event. For example, the NRC inspectors found that, after correcting a previous problem with the control and shim rod magnets, the SRO's had only four hours during their normal shift schedule to complete the planned fuel moves. This was said to create a rushed atmosphere for the test activities.

In moving the fuel element while the reactor was critical, the two SROs handling the fuel indicated that they did not clearly know the condition of the reactor when they removed the fuel element. The ARM did not maintain adequate control over the entire test activity. The distraction of completing the control room log contributed to poor communications with the other SROs.

The licensee has modified its procedures and will install illuminated indicators on the rod drive housing located on the bridge. The indicators will be illuminated only when the rods are fully inserted. These changes to the procedures and equipment will give more positive communication, enable operators to better control fuel changes, and visually indicate the status of the control rods.

This event is an example where licensed operators at a research reactor became so involved in tasks that they failed to maintain adequate control of the reactor. The operators did not maintain current knowledge of the condition of the reactor and therefore were not cognizant of the effect that their actions would have on that condition.

This information notice requires no specific action or written response. If you have any questions about this matter, please contact the technical contact listed below or the appropriate Nuclear Reactor Regulation (NRR) project manager.



Brian K. Grimes, Director
Division of Operating Reactor Support
Office of Nuclear Reactor Regulation

Technical contact: Charles Cox, RIII
(708) 790-5298

Project Manager: Theodore S. Michaels, NRR
(301) 504-1102

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
92-59, Rev. 1	Horizontally-Installed Motor-Operated Gate Valves	11/04/92	All holders of OLs or CPs for nuclear power reactors.
92-72	Employee Training and Shipper Registration Requirements for Transporting Radioactive Materials	10/28/92	All U.S. Nuclear Regulatory Commission Licensees.
91-64, Supp. 1	Site Area Emergency Resulting from A Loss of Non-Class 1E Uninterruptible Power Supplies	10/07/92	All holders of OLs or CPs for nuclear power reactors.
92-71	Partial Plugging of Suppression Pool Strainers At A Foreign BWR	09/30/92	All holders of OLs or CPs for nuclear power reactors.
92-70	Westinghouse Motor-Operated Valve Performance Data Supplied to Nuclear Power Plant Licensees	09/25/92	All holders of OLs or CPs for nuclear power reactors.
92-69	Water Leakage from Yard Area Through Conduits Into Buildings	09/22/92	All holders of OLs or CPs for nuclear power reactors.
91-29, Supp. 1	Deficiencies Identified During Electrical Distribution System Functional Inspections	09/14/92	All holders of OLs or CPs for nuclear power reactors.
92-68	Potentially Substandard Slip-On, Welding Neck, and Blind Flanges	09/10/92	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

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WASHINGTON, D.C. 20555-0001

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Original signed by
Brian K. Grimes

Brian K. Grimes, Director
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Office of Nuclear Reactor Regulation

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DOCUMENT NAME: 92-73.IN

*SEE PREVIOUS CONCURRENCE.

OFC	DRSS:RIII	DIR:PDNP	PM:PDNP	LA:PDNP	TECHED
NAME	CCox	SWeiss	TMichaels	EHylton	JMain
DATE	10/19/92*	10/6/92*	10/6/92*	9/29/92*	10/20/92*

OFC	BC:OGCB:DORS	DIR:DORS	OGCB:DORS
NAME	GHMarcus	BKGrimes	JPetrosino
DATE	10/23/92*	10/2/92	10/21/92*

This event at the research reactor is an example where licensed operators became so involved in a single task or several tasks that they failed to maintain adequate control of the reactor. The fundamental principle for safe reactor operations is that the operators always know the condition of the reactor and the effect that their actions would have on that condition.

This information notice requires no specific action or written response. If you have any questions about this matter, please contact the technical contact listed below or the appropriate Nuclear Reactor Regulation (NRR) project manager.

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OFC	BC:OGCB:DORS	DIR:DORS	OGCB:DORS
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DATE	10/23/92	10/ /92	10/21/92*

This event at the research reactor is an example where licensed operators became so involved in a single task or several tasks that they failed to maintain adequate control of the reactor. The fundamental principle for safe reactor operations is that the operators always know the condition of the reactor and the effect that their actions would have on that condition. Licensees are reminded that the reactor operators on duty have a licensed responsibility to know the condition of the reactor and to ensure safe operation of their facilities at all times.

This information notice requires no specific action or written response. If you have any questions about this matter, please contact the technical contact listed below or the appropriate Nuclear Reactor Regulation (NRR) project manager.

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OFC	BC:OGCB:DORS	DIR:DORS	OGCB:DORS
NAME	GHMarcus	BKGrimes	JPetrosino

October 6, 1992

MEMORANDUM FOR: Gail H. Marcus, Chief
Generic Communications Branch
Division of Operating Reactor Support
Office of Nuclear Reactor Regulation

FROM: Seymour H. Weiss, Director
Non-Power Reactors, Decommissioning and
Environmental Project Directorate
Division of Operating Reactor Support
Office of Nuclear Reactor Regulation

SUBJECT: PROPOSED DRAFT INFORMATION NOTICE ON NON-POWER REACTOR EVENT
CONSIDERATIONS

In accordance with NRC Inspection Manual Chapter 0720, I have enclosed, the subject draft information notice. The individuals who receive courtesy copies of this memorandum should also be considered by the Generic Communications Branch to be included for concurrence on this information notice.

/s/
Seymour H. Weiss, Director
Non-Power Reactors, Decommissioning and
Environmental Project Directorate
Division of Operating Reactor Support
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
F. Fouchard, OPA
C. Norelius, RIII/DRSS

Doc
"Marcus"

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