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

June 28, 1994

NRC INFORMATION NOTICE 94-13, SUPPLEMENT 1: UNANTICIPATED AND UNINTENDED MOVEMENT OF FUEL ASSEMBLIES AND OTHER COMPONENTS DUE TO IMPROPER OPERATION OF REFUELING EQUIPMENT

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 supplement to alert addressees to an event involving unauthorized movement of a defective spent fuel rod. 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.

Background

The NRC issued Information Notice (IN) 94-13, "Unanticipated and Unintended Movement of Fuel Assemblies and Other Components Due to Improper Operation of Refueling Equipment," to alert addressees to problems that could result from inadequate oversight of refueling operations and inadequate performance on the part of refueling personnel. IN 94-13 described various refueling events that occurred at Vermont Yankee, Peach Bottom, Susquehanna, and Nine Mile Point. These events demonstrate the importance of proper controls over, and operation of, refueling equipment during use. A recent event at the Waterford Steam Electric Station (Waterford) demonstrates the potential for fuel damage or personnel hazards which could result from fuel-handling equipment that is not properly stored and not secured from unauthorized use.

Description of Circumstances

On February 18, 1994, the Waterford plant was operating at 100-percent power when a senior reactor operator found an unknown object hanging from the fuel-handling machine in the fuel-handling building. Health physics technicians measured radiation levels in the spent fuel pool area and found them to be normal. Licensee personnel remotely secured the object with vise grips and determined that underwater radiation levels were .2 to .7 Sv/hr [20 to 70 R/hr] at 15 centimeters [6 inches] from the object. A Combustion Engineering employee identified the object as a fuel rod encapsulation tube. No visual damage was apparent on the tube. The licensee posted a security guard in the spent fuel pool area and reported the event to the NRC.

The licensee reviewed fuel storage records and determined that the tube contained a defective fuel rod that had been removed from an irradiated fuel assembly several years earlier. At that time, the tube had been placed in a center guide tube in a grid cage stored in the spent fuel racks. The licensee reviewed computer access records for the fuel-handling area and interviewed relevant personnel about the event. Personnel who may have had access to the fuel-handling machine completed questionnaires regarding the event. The licensee determined that the refueling director had used the fuel-handling machine the day before the object was discovered and had parked the fuel-handling machine at a location directly over the fuel rod encapsulation tube. However, the refueling director had not used the hoist and was not sure that he would have noticed if the encapsulation tube was hanging from the hoist at the time he used the machine. Surveillance records indicated that the fuel rod encapsulation tube must have become attached to the fuel-handling tool sometime between February 11 and 18, 1994.

Design drawings of the cap of the fuel rod encapsulation tube showed that the outer diameter of the cap was about equal to the inner diameter of the end of the fuel-handling tool. Apparently, the cap had become bound in the fuel-handling tool when the hoist was lowered to the top of the spent fuel rack and, when the hoist was raised, the tube was completely removed from the grid cage.

Although contractors had performed the fuel-handling operations for previous refueling outages, Waterford personnel were scheduled to perform the fuel handling for the March 1994 refueling outage. The licensee speculated that one of the people assigned to fuel-handling activities for the March outage may have inadvertently lifted the encapsulation tube while practicing the use of the hoist. Personnel were required to notify health physics staff before accessing the refueling machine; however, health physics records showed that no one had made such a notification during this time. No keys or special knowledge was needed to access the controls of the fuel-handling machine. Electrical power could be obtained by closing two electrical breakers and pushing one switch that were located on the machine. The licensee questioned several employees, but no one admitted to unauthorized use of the fuel-handling machine.

As an interim corrective action, the licensee deenergized the computer that controls the fuel-handling machine by opening a breaker in a locked power control center. The licensee planned to (1) develop a means to prevent the fuel rod encapsulation tube from being inadvertently lifted by the fuel-handling tool, (2) add a precaution to the operating procedure warning operators not to lower the fuel-handling tool over the storage location, and (3) add hoist manipulations to the lesson plans for proficiency training.

Discussion

Procedures governing the use of equipment for handling fuel and core components may not prevent unauthorized or unintended operation of that equipment. Precautions such as locking out breakers that energize the fuel-handling equipment and the placement of placards in highly visible areas declaring that unauthorized operation of fuel-handling equipment is forbidden

may help ensure that the equipment is not used without proper authorization. Additionally, storing the fuel-handling machine in an area where accidental movement of the hoist or grapple will not impact stored fuel or other components may contribute to the prevention of inadvertent fuel movement or damage. Management attention and oversight of the operation of fuel and core component handling equipment is important to ensure that fuel and core components are protected from damage or unauthorized movement and that plant personnel are protected from unnecessary exposure to radiation.

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

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

Technical contact: Dale A. Powers, RIV
(817) 860-8195

Attachment:
List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
94-47	Accuracy of Information Provided to NRC during the Licensing Process	06/21/94	All U.S. Nuclear Regulatory Commission Material Licensees.
94-46	NonConservative Reactor Coolant System Leakage Calculation	06/20/94	All holders of OLs or CPs for nuclear power reactors.
94-45	Potential Common-Mode Failure Mechanism for Large Vertical Pumps	06/17/94	All holders of OLs or CPs for nuclear power reactors.
94-44	Main Steam Isolation Valve Failure to Close on Demand because of Inadequate Maintenance and Testing	06/16/94	All holders of OLs or CPs for nuclear power reactors.
94-43	Determination of Primary-to-Secondary Steam Generator Leak Rate	06/10/94	All holders of OLs or CPs for pressurized water reactors.
94-42	Cracking in the Lower Region of the Core Shroud in Boiling-Water Reactors	06/07/94	All holders of OLs or CPs for boiling-water reactors (BWRs).
94-41	Problems with General Electric Type CR124 Overload Relay Ambient Compensation	06/07/94	All holders of OLs or CPs for nuclear power reactors.
94-40	Failure of a Rod Control Cluster Assembly to Fully Insert Following a Reactor Trip at Braidwood Unit 2	05/26/94	All holders of OLs or CPs for pressurized-water reactors (PWRs).
94-39	Identified Problems in Gamma Stereotactic Radiosurgery	05/31/94	All U.S. Nuclear Regulatory Commission Teletherapy Medical Licensees.

OL = Operating License
CP = Construction Permit

may help ensure that the equipment is not used without proper authorization. Additionally, storing the fuel-handling machine in an area where accidental movement of the hoist or grapple will not impact stored fuel or other components may contribute to the prevention of inadvertent fuel movement or damage. Management attention and oversight of the operation of fuel and core component handling equipment is important to ensure that fuel and core components are protected from damage or unauthorized movement and that plant personnel are protected from unnecessary exposure to radiation.

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

Alfred E. Chaffee for

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

Technical contact: Dale A. Powers, RIV
(817) 860-8195

Attachment:
List of Recently Issued NRC Information Notices

* See Previous Concurrence

OFFICE	RPB:ADM	HHFB:DRCH	C/HHFB:DRCH	D/DRCH:NRR
NAME	RSanders*	DDesaulniers*	MMSlosson*	BABoger*
DATE	05/26/94	06/01/94	06/01/94	06/02/94

OFFICE	C/MB:DRS:RIV	OGCB:DORS:NRR	AC/OGCB:NRR	D/DORS:NRR
NAME	DPowers*	JLBirmingham*	RJKiessel*	BKGrimes
DATE	06/03/94	06/03/94	06/07/94	06/23/94

Document Name: 94-13SP1.IN

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

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

Technical contact: Dale A. Powers, Region IV
(817) 860-8195

Attachment:
List of Recently Issued NRC Information Notices

* See Previous Concurrence

OFFICE	RPB:ADM	HHFB:DRCH	C/HHFB:DRCH	D/DRCH:NRR
NAME	RSanders*	DDesaulniers*	MMSlosson*	BABoger*
DATE	05/26/94	06/01/94	06/01/94	06/02/94

OFFICE	C/MB:DRS:RIV	OGCB:DORS:NRR	AC/OGCB:NRR	D/DORS:NRR
NAME	DPowers*	JLBirmingham	RJKiessel	BKGrimes
DATE	06/03/94	06/03/94	06/7/94	06/ /94

Document Name: G:\WTRFRD.JLB

mkm

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

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

Technical contact: Dale A. Powers, Region IV
(817) 860-8195

Attachment:
List of Recently Issued NRC Information Notices

* See Previous Concurrence #1 6/1

OFFICE	RPB:ADM	HHFB:DRCH	C/HHFB:DRCH	D/DRCH:NRR
NAME	RSanders		MMSlosson	CABoger
DATE	05/26/94	06/ /94	06/ /94	06/2/94

OFFICE	C/MB:DRS:RIV	OGCB:DORS:NRR	AC/OGCB:NRR	D/DORS:NRR
NAME	DPowers	JLBirmingham		BKGrimes
DATE	06/03/94	06/03/94	06/ /94	06/ /94

Document Name: G:\WTRFRD.JLB