

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS  
WASHINGTON, D. C. 20555

January 11, 1989

NRC INFORMATION NOTICE NO. 89-03: POTENTIAL ELECTRICAL EQUIPMENT PROBLEMS

Addressees:

All Fuel Cycle and Major Nuclear Materials licensees.

Purpose:

This information notice is being provided to advise certain NRC fuel cycle and materials licensees of potential electrical equipment problems that may be caused by inadequate maintenance, equipment component defects, or procurement practices. It is expected that you will review this information for applicability, distribute it to responsible radiation safety, maintenance and procurement staff, and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this notice do not constitute new NRC requirements; no written response is required.

Description of Circumstances:

Concerns regarding electrical equipment problems with materials licensees were prompted by recent inspection findings that counterfeit, substandard, or questionable electrical equipment or components had been used in nuclear power reactors. The inspection findings indicated that the electrical equipment problems appeared to be significant and pervasive. As a result, several NRC information notices were issued which reflected such equipment problems involving nuclear utilities, equipment manufacturers, and vendors. Furthermore, several electrical suppliers were identified as those associated in refurbishing and sale of defective equipment components to nuclear and non-nuclear industries. Therefore, the electrical equipment problem does not appear to be confined to nuclear power reactors or the nuclear industry. Similar problems may also exist in non-nuclear medical and industrial operations as well.

A review of previously published NRC information notices and bulletins addressed to materials licensees revealed that there had been incidents which involved failure of electrical equipment and components such as pressure regulator switches, teletherapy timers, solid-state relays, and solenoid valves, which could have resulted in radiation overexposures. A brief description of the incidents is provided below:

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1. IE Information Notice No. 84-77:

A defective solid-state relay in a circuit board of a teletherapy unit caused the source unit to move to the exposed position. This could cause both the teletherapy operator and the patient to receive excessive radiation exposures. This incident also may have generic implications because of the non-fail-safe design of the relay circuit.

2. IE Information Notice No. 85-54:

A failure of a pressure regulator switch on the pneumatic system to an Atomic Energy of Canada, Ltd. (AECL) Theratron 60 teletherapy unit caused an overpressure condition in the holding tank and prevented the source drawer from immediately closing on command.

3. IE Bulletin No. 86-04:

The bulletin described how an operational malfunction of a teletherapy timer could result in radiation misadministration to patients and possible excessive radiation exposures to teletherapy operators.

4. NRC Information Notice No. 87-29:

The Notice described several related incidents at large irradiators. One event involved an irradiator source unable to retract to its fully shielded position due to a frozen solenoid valve.

Discussion:

Although these incidents apparently did not involve counterfeit equipment, these incidents illustrate the need for facility management to have an adequate maintenance and procurement program. Therefore, licensees are urged to thoroughly review their programs to ensure that the procedures for operations, service, repair, or replacement are being followed properly. Licensees should also review their procurement procedures and practices, especially in areas such as purchase orders, materials requirements, vendor qualifications, and receipt inspections, to ensure quality control and compliance.

No specific action or written response is required by this information notice. If you should have any questions about this matter, please contact the the appropriate NRC regional office or the technical contact listed below.



Richard E. Cunningham, Director  
Division of Industrial and  
Medical Nuclear Safety  
Office of Nuclear Material Safety  
and Safeguards

Technical Contact: K. C. Leu, NMSS  
(301) 492-0696

**Attachments:**

1. List of Recently Issued NMSS Information Notices
2. List of All Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED  
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
89-02	Criminal prosecution of licensee's former president for intentional safety violations	01/09/89	All holders of NRC specific license
88-100	Memorandum of understanding between NRC and OSHA relating to NRC-licensed facilities (53 FR 43950, October 31, 1988)	12/23/88	All major nuclear materials licensees and utilities holding CPs and OLS.
88-93	Teletherapy Events	12/2/88	All NRC medical licensees
88-90	Unauthorized removal of industrial nuclear gauges	11/22/88	All NRC licensees authorized to possess, use, manufacture, or distribute industrial nuclear gauges
88-66	Industrial radiography inspection and enforcement	08/22/88	All NRC industrial radiography licensees
88-62	Recent findings concerning implementation of quality assurance programs by suppliers of transport packages	08/12/88	All holders of NRC quality assurance program approvals for radioactive material packages
88-33	Recent problems involving the model Spec 2-T radiographic exposure device	05/27/88	All Agreement States and NRC licensees authorized to manufacture, distribute or operate radiographic exposure devices and source changers
88-32	Prompt reporting to NRC of significant incidents involving radioactive material	05/25/88	All NRC materials licensees

OL = Operating License  
CP = Construction Permit

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Information Notice No.	Subject	Date of Issuance	Issued to
89-02	Criminal Prosecution of Licensee's Former President for Intentional Safety Violations	1/9/89	All holders of a U.S. NRC specific license.
88-23, Supp. 1	Potential for Gas Binding of High-Pressure Safety Injection Pumps During a Loss-of-Coolant Accident	1/5/89	All holders of OLS or CPs for PWRs.
89-01	Valve Body Erosion	1/4/89	All holders of OLS or CPs for nuclear power reactors.
88-46, Supp. 2	Licensee Report of Defective Refurbished Circuit Breakers	12/30/88	All holders of OLS or CPs for nuclear power reactors.
88-101	Shipment of Contaminated Equipment between Nuclear Power Stations	12/28/88	All holders of OLS or CPs for nuclear power reactors.
88-100	Memorandum of Understanding between NRC and OSHA Relating to NRC-licensed Facilities (53 FR 43950, October 31, 1988)	12/23/88	All major nuclear materials licensees and utilities holding CPs and OLS.
88-99	Detection and Monitoring of Sudden and/or Rapidly Increasing Primary-to-Secondary Leakage	12/20/88	All holders of OLS or CPs for PWRs.
88-98	Electrical Relay Degradation Caused by Oxidation of Contact Surfaces	12/19/88	All holders of OLS or CPs for nuclear power reactors.
88-97	Potentially Substandard Valve Replacement Parts	12/16/88	All holders of OLS or CPs for nuclear power reactors.

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Technical Contact: K. C. Leu, NMSS  
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1. List of Recently Issued NMSS Information Notices
2. List of All Recently Issued NRC Information Notices

Ellen Kraus  
reviewed 11/08/88

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\*See previous concurrence

Ellen Kraus reviewed 11/08/88

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NAME: K. C. Leu :lg/mh: F. E. Brown : M. L. Mastra : J. P. Roberts : L. C. Rouse : G. L. Sjoblom : R. E. Cunningham

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The Notice described several safety-related incidents at large irradiators. One event involved an irradiator source unable to retract to its fully shielded position due to a frozen solenoid valve.

Discussion

The above described incidents at materials license facilities illustrate the need for facility management to have an adequate maintenance and procurement program. Therefore, you are urged to review thoroughly your management controls program, to ensure that the procedures for facility equipment controls, equipment operations, service, repair, or replacement are being followed properly. You should also review your procurement procedures and practices, especially in areas such as purchase orders, materials requirements, vendor qualifications, and receipt inspections, to ensure quality compliance and facility safe operation.

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