

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

September 21, 1993

NRC INFORMATION NOTICE 93-76: INADEQUATE CONTROL OF PAINT AND CLEANERS FOR  
SAFETY-RELATED 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 to alert addressees to recent plant events during which safety-related plant equipment was rendered inoperable because of inadequate material control. 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

Inoperable Emergency Diesel Generator Caused by Painting

On December 29-30, 1992, while South Texas Project, Unit 1 was in hot shutdown, Houston Lighting and Power Company (the licensee) repainted emergency diesel generator "C". The diesel generator remained in service during the painting evolution and no post-maintenance test of the engine was performed to verify operability. The work request for the painting of the emergency diesel generators includes a requirement for a post-maintenance test after painting of the equipment. The post-maintenance test requirement was deleted by a system engineer who decided that a post-maintenance test was not necessary because the diesel was not declared inoperable. On January 20, 1993, while Unit 1 was at 95 percent power, emergency diesel generator "C" failed to start during a surveillance test. The licensee determined that paint in the metering rod guides for the injectors had locked up the fuel racks, preventing the diesel generator from attaining the rated speed during the surveillance test. The areas were cleaned and maintenance personnel cycled the fuel rack linkage to ensure the racks moved freely in both directions. The emergency diesel generator was satisfactorily tested and returned to service on January 22, 1993. The licensee had last successfully tested this diesel generator on December 24, 1992, before it was repainted.

Between December 29, 1992, and January 20, 1993, the licensee (1) changed operating modes three times, (2) experienced several instances of cross train

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equipment being out of service for a time greater than that allowed by the limiting condition for operation with this emergency diesel generator inoperable, and (3) experienced one instance of another diesel generator being inoperable for a time greater than allowed by the limiting condition for operation for two diesels out of service.

Emergency diesel generator "C" was the first of the diesel generators to be painted. The licensee has implemented precautions to be taken to assure that diesel generators are operable following painting evolutions.

#### Inoperable Diesel Generator Caused by the Use of Unapproved Cleaner

On January 6, 1992, while the main generator at Brunswick Steam Electric Plant, Unit 2, was being taken off line, Carolina Power and Light Company (the licensee) found that a main turbine stop valve limit switch had failed, causing an inadvertent electrical lock-out. The lock-out initiated an automatic start signal to all four emergency diesel generators; however, emergency diesel generator 2 failed to start. The licensee initiated a quick start signal and observed that all components functioned normally except that the fuel control racks did not move.

The licensee removed and inspected the fuel control racks and found that the metering rods on the left bank fuel control racks were extremely dry and were sticking, the metering rods on the right bank fuel control racks contained coagulated lubricant, and both fuel control racks were covered by a very thin white residue. The licensee analyzed this residue and determined it was from the Planisol-M used to clean the emergency diesel generator. This residue and the loss of lubrication on the fuel control linkage prevented the fuel control racks from moving and caused the emergency diesel generator to fail to start. The licensee implemented a procedure which requires that the Planisol-M residue be removed from all surfaces and that the equipment be properly lubricated after it is cleaned before it is declared operable.

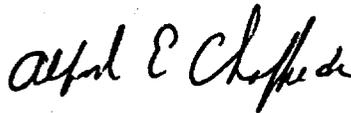
#### Inoperable Switches Caused by the Use of Unapproved Cleaner

On October 25, 1992, while the Waterford Steam Electric Station was in cold shutdown, an operator used a commercial contact cleaner to clean engineered safeguards control panel CP-8. The cleaner used was SWISH, a product manufactured by Chemsearch. SWISH is normally used for coin-operated vending machines and electronic equipment, and is not approved for use on the control panels. Within approximately 2 hours, the cleaner solvent caused the plastic parts of 16 safety-related control switches to bond together, making the switches inoperable. The inoperable switches affected various engineering safety features equipment, including suction valves from the refueling water storage pool, a high-pressure safety injection pump, and flow control valves for low pressure cold-leg injection. The licensee issued a standing instruction to identify the only approved cleaner to be used on the control panels.

Discussion

These events are examples of deficiencies in the control of materials and processes used on safety-related equipment. Appendix B to 10 CFR Part 50 establishes quality assurance requirements for safety-related equipment at nuclear power plants. The pertinent requirements of Appendix B apply to all activities affecting the safety-related functions of equipment including cleaning and painting. The events described above demonstrate that even apparently benign actions such as cleaning and painting may have consequences that are detrimental to safety, and that personnel are not always adequately aware of the potential effects of such actions on the safety functions of safety-related equipment.

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 managers.



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

Technical contact: Eric J. Benner, NRR  
(301) 504-1171

Attachment:  
List of Recently Issued NRC Information Notices

Attachment  
 IN 93-76  
 September 21, 1993  
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LIST OF RECENTLY ISSUED  
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
93-75	Inadequate Control of Paint and Cleaners for Safety-Related Equipment	09/21/93	All holders of OLs or CPs for nuclear power reactors.
93-74	High Temperatures Reduce Limitorque AC Motor Operator Torque	09/16/93	All holders of OLs or CPs for nuclear power reactors.
93-73	Criminal Prosecution of Nuclear Suppliers for Wrongdoing	09/15/93	All NRC licensees.
93-72	Observations from Recent Shutdown Risk and Outage Management Pilot Team Inspections	09/14/93	All holders of OLs or CPs for nuclear power reactors.
93-71	Fire at Chernobyl Unit 2	09/13/93	All holders of OLs or CPs for nuclear power reactors.
93-70	Degradation of Boraflex Neutron Absorber Coupons	09/10/93	All holders of OLs or CPs for nuclear power reactors.
93-69	Radiography Events at Operating Power Reactors	09/02/93	All holders of OLs or CPs for nuclear power reactors and all radiography licensees.
93-68	Failure of Pump Shaft Coupling Caused by Temper Embrittlement during Manufacture	09/01/93	All holders of OLs or CPs for nuclear power reactors.
92-16, Supp. 2	Loss of Flow from the Residual Heat Removal Pump during Refueling Cavity Draindown	08/23/93	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License  
 CP = Construction Permit

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 WASHINGTON DC 20555

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Regional section chiefs have reviewed applicable writeups and provided comments in discussions on May 27, 1993.

\*See previous concurrences

OFC	OEAB:DORS	SC/OEAB:DORS	ADM:PUB	C/OEAB:DORS
NAME	EBenner	EGoodwin*	Tech Ed*	AChaffee*
DATE	09/11/93	05/21/93	05/20/93	06/18/93

OFC	OGCB:DORS	C/OGCB:DORS	D/DORS
NAME	DKirkpatrick*	GMarcus*	BGrimes
DATE	07/28/93	07/29/93	7/16/93

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NAME	DKirkpatrick*	GMarcus*	BGrimes
DATE	07/28/93	07/29/93	/ /93

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Discussion

These events are examples of deficiencies in the control of material used on safety-related equipment. These types of events demonstrate that even apparently benign actions such as cleaning and painting may have consequences that are detrimental to safety, and that personnel are not always adequately aware of the potential effects of such actions on safety.

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NAME	GMarcus <i>GHM</i>	BGrimes
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DKirkpatrick  
07/28/93 *DK*

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Document Name: MATERIAL.IN

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These events are examples of deficiencies in the control of material used on safety-related equipment. These types of events are of concern because personnel may have a decreased awareness of the safety consequences of apparently benign actions such as cleaning and painting.

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NAME	GMarcus	BGrimes
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*Please add Dkerpatrick to the concurrences*

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