

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555-0001

October 30, 1996

**NRC INFORMATION NOTICE 96-59: POTENTIAL DEGRADATION OF POST LOSS-OF-COOLANT RECIRCULATION CAPABILITY AS A RESULT OF DEBRIS**

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 that the suppression pool and associated components of two boiling-water reactors (BWRs) have been found to contain foreign objects that could have impaired successful operation of emergency safety systems using water from the suppression pool. 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

Niagara Mohawk Power Corporation, the licensee for Nine Mile Point Unit 2, reported on October 17, 1996, that a significant amount of debris was found during inspection of the drywell-to-suppression chamber downcomers. Most downcomers were clean or contained minimal debris. However, 17 downcomers contained debris, and 7 of the 8 downcomers located directly under the reactor vessel had cleanliness covers installed over the downcomer opening. Some debris was floating on the water inside the downcomers and consisted of foam rubber cleanliness covers, plastic bags, Tygon tubing, hard hats, and so on. The suppression pool had been cleaned during the previous refueling outage.

Commonwealth Edison Company reported on October 16, 1996, that during the first thorough cleaning of the LaSalle Unit 2 suppression pool, a significant amount of foreign material had been found under a layer of sludge. Sludge is a generic term for rust particles from the carbon steel piping connected to the suppression pool. Foreign material was also found in several downcomers. The foreign material included a rubber mat, a sheet of gasket material, a nylon bag, and a substantial amount of sludge. The licensee concluded that sufficient material was present to challenge the clogging limit for multiple emergency core cooling system (ECCS) strainers. The Unit 2 pool had been inspected previously to remove visible debris, and the strainers had been cleaned.

PDR I&E Notice 96-059 961030

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updated on 11/18/96

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## Discussion

Section 50.46 of Title 10 of the Code of Federal Regulations (10 CFR 50.46) requires that licensees design their ECCSs so that the calculated cooling performance following a loss-of-coolant accident (LOCA) meets five criteria, one of which is to provide long-term cooling capability of sufficient duration following a successful system initiation so that the core temperature shall be maintained at an acceptably low value and decay heat shall be removed for the extended period required by the long-lived radioactivity remaining in the core.

On October 17, 1995, the NRC issued Bulletin 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode," which requested BWR licensees to review the operability of their ECCS and other pumps that draw suction from the suppression pool while performing their safety function. The addressees' evaluations were to be based on suppression pool cleanliness, suction strainer cleanliness, and the effectiveness of their foreign material exclusion practices. In addition, licensees were to implement appropriate procedural modifications and other actions (e.g., suppression pool cleaning), as necessary, to minimize foreign material in the suppression pool, the drywell, and systems that interface with the suppression pool. Licensees were to verify their operability evaluation through appropriate testing and inspection.

The actions of both licensees were a consequence of the requested actions of Bulletin 95-02. The LaSalle Unit 2 suppression pool was being thoroughly cleaned as requested by the bulletin, and the Nine Mile Point Unit 2 suppression pool was being reinspected as part of the enhanced surveillance requested by the bulletin.

The NRC has issued a number of generic communications to describe aspects of the potential for loss of recirculation capability as a result of strainer clogging and debris blockage. While the past generic communications contain examples that focus on specific considerations that are most applicable to either pressurized-water reactors (PWRs) or BWRs, the basic safety concern applies to both BWRs and PWRs. These events as well as those in previous generic communications demonstrate the need for a thorough cleaning of all areas of PWRs and BWRs that may contain materials which could adversely affect LOCA recirculation. Visual inspection and spot cleaning cannot ensure that all undesirable and unanticipated foreign material will be eliminated.

## Related Generic Communications

Recent instances of problems with strainer clogging are described in the following generic communications:

- . NRC Generic Letter 85-22: "Potential for Loss of Post LOCA Recirculation Capability Due to Insulation Debris Blockage," dated November 22, 1985.
- . NRC Information Notice 89-77: "Debris in Containment Emergency Sumps and Incorrect Screen Configuration," dated November 21, 1989.

- NRC Information Notice 92-71: "Partial Plugging of Suppression Pool Strainers at a Foreign BWR," dated September 30, 1992.
- NRC Information Notice 92-85: "Potential Failures of Emergency Core Cooling Systems Caused by Foreign Material Blockage," dated December 23, 1992.
- NRC Bulletin 93-02 and Supplement 1: "Debris Plugging of Emergency Core Cooling Suction Strainers," dated May 11, 1993 and February 18, 1994.
- NRC Information Notice 93-34 and Supplement 1: "Potential for Loss of Emergency Core Cooling Function Due to a Combination of Operational and Post-LOCA Debris in Containment," dated April 26, 1993 and May 6, 1993.
- NRC Information Notice 95-06: "Potential Blockage of Safety-Related Strainers by Material Brought Inside Containment," dated January 25, 1995.
- NRC Information Notice 95-47: "Unexpected Opening of a Safety/Relief Valve and Complications Involving Suppression Pool Cooling Strainer Blockage," dated October 4, 1995.
- NRC Bulletin 95-02: "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode, dated October 13, 1995.
- NRC Bulletin 96-03: "Potential Plugging of Emergency Core Cooling Suction Strainers By Debris in Boiling-Water Reactors," dated May 6, 1996.

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



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Attachment: List of Recently Issued NRC Information Notices

- NRC Information Notice 92-71: "Partial Plugging of Suppression Pool Strainers at a Foreign BWR," dated September 30, 1992.
- NRC Information Notice 92-85: "Potential Failures of Emergency Core Cooling Systems Caused by Foreign Material Blockage," dated December 23, 1992.
- NRC Bulletin 93-02 and Supplement 1: "Debris Plugging of Emergency Core Cooling Suction Strainers," dated May 11, 1993 and February 18, 1994.
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original signed by  
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Tech Editor has reviewed and concurred on 10/24/96 \*SEE PREVIOUS CONCURRENCES  
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LIST OF RECENTLY ISSUED  
NRC INFORMATION NOTICES

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Information Notice No.	Subject	Date of Issuance	Issued to
96-58	RCP Seal Replacement with Pump on Backseat	10/30/96	All holders of OLs or CPs for pressurized-water reactors
96-57	Incident-Reporting Requirements Involving Intakes, During a 24-Hour Period That May Cause a Total Effective Dose Equivalent in Excess of 0.05 Sv (5 rems)	10/30/96	All U.S. Nuclear Regulatory Commission licensees
96-56	Problems Associated with Testing, Tuning, or Resetting of Digital Control Systems While at Power	10/22/96	All holders of OLs or CPs for nuclear power reactors
96-55	Inadequate Net Positive Suction Head of Emergency Core Cooling and Containment Heat Removal Pumps Under Design Basis Accident Conditions	10/22/96	All holders of OLs or CPs for nuclear power reactors
96-54	Vulnerability of Stainless Steel to Corrosion When Sensitized	10/17/96	All materials licensees
96-53	Retrofit to Amersham 660 Posilock Radiography Camera to Correct Inconsistency in 10 CFR Part 34 Compatibility	10/15/96	All industrial radiography licensees

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OL = Operating License  
CP = Construction Permit