

# LIS ORIGINAL

SSINS No.: 6835  
IN 86-50

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, D.C. 20555

June 18, 1986

IE INFORMATION NOTICE NO. 86-50: INADEQUATE TESTING TO DETECT FAILURES OF SAFETY-RELATED PNEUMATIC COMPONENTS OR SYSTEMS

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or a construction permit (CP).

Purpose:

This notice is being provided to alert recipients to a potentially significant problem pertaining to inadequate testing practice relating to air operated valves. The NRC expects that recipients will review this notice for applicability to their facilities. However, suggestions contained in this notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Past Related Correspondence:

IE Information Notice No. 82-25, "Failures of Hiller Actuators Upon Gradual Loss of Air Pressure," July 20, 1982

IE Information Notice No. 85-35, "Failure of Air Check Valves to Seat," April 30, 1985

IE Information Notice No. 85-84, "Inadequate Inservice Testing of Main Steam Isolation Valves," October 30, 1985

IE Information Notice No. 85-94, "Potential for Loss of Minimum Flow Paths Leading to ECCS Pump Damage During a LOCA," December 13, 1985

Description of Circumstances:

The NRC has reported previously on instances where safety-related equipment failed to operate as intended when non-safety-related pneumatic systems were unavailable (IE INs 82-25 and 85-35). In these situations, main steam isolation valves and containment isolation valves failed to operate properly when control air pressure decreased slowly rather than rapidly as would be expected for an air line break. In the case of IN 85-35, the fault was exposed by a loss of offsite power test, and in the case of IN 82-25, the fault was exposed by a preoperational test designed to simulate a slow air leak. In both cases,

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the components in question--an accumulator isolation check valve (IN 85-35) and pneumatic selector valves (IN 82-25)--were not tested adequately. Several recent events have indicated continuing problems of similar nature. These events are discussed below.

On February 13, 1986, the licensee at Turkey Point Unit 3 first reported to the NRC a concern that the component cooling water (CCW) system might fail to meet its functional requirements for a design-basis accident. One part of the concern involved the CCW heat exchanger outlet control valve. This valve regulates flow of intake cooling water (ICW) to this heat exchanger. Loss of control air, coincident with a loss of offsite power, a valid engineered safeguards features (ESF) actuation signal, and a loss of an emergency diesel generator (EDG) would cause this valve to fail closed. If this happened, the CCW heat exchanger would not receive sufficient flow of ICW. This situation was discovered during a design review of the ICW system. Earlier disclosure might have been possible if ICW operation had been considered or tested with non-safety-related control air secured, coincident with loss of electrical power.

On January 7, 1986, the licensee at Robinson Unit 2 reported a concern with the air-operated valves in the safety injection (SI) pump minimum-flow recirculation line from the pump discharge to the refueling water storage tank (RWST). This concern evolved from review of IN 85-94. Two such valves had been inserted in series in this line and had been designed to fail closed on loss of non-safety-related air or loss of electrical power to the valves. The purpose of the valves is to protect the RWST (outside containment) from highly radioactive reactor coolant during the long-term circulation phase of accident recovery. In the event of SI initiation under small-break loss-of-coolant-accident conditions concurrent with closure of either of these valves, the SI pumps would be operating with no flow until reactor pressure decreased below their shutoff head. This would damage the SI pumps after only a short time. The licensee's remedy was to put mechanical blocks on the air operators so the valves would fail as-is (open). Again, if SI operation had been considered or tested with non-safety-related control air secured, the fault might have been disclosed earlier.

On December 9, 1985, the licensee at Catawba Unit 2 reported finding that one of the two valve closure springs was missing on one of the pressurizer power-operated relief valves (PORVs). Thus, with loss of air the valve would not have closed against system pressure. The other two PORVs had their normal complement of springs. The valve with the missing spring had been found satisfactory in preoperational tests. During the preoperational loss of air test, the valve closed because system pressure was not present; during the hot functional test, the valve closed because actuator air pressure was present. This is clearly a case in which a fail safe valve was tested without all actuator power secured (IN 85-84).

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.

  
Edward L. Jordan, Director  
Division of Emergency Preparedness  
and Engineering Response  
Office of Inspection and Enforcement

Technical Contact: Vern Hodge, IE  
(301) 492-7275

Attachment: List of Recently Issued IE Information Notices

LIST OF RECENTLY ISSUED  
 IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
86-49	Age/Environment Induced Electrical Cable Failues	6/16/86	All power reactor facilities holding an OL or CP
86-48	Inadequate Testing Of Boron Solution Concentration In The Standby Liquid Control System	6/13/86	All BWR facilities holding an OL or CP
86-47	Feedwater Transient With Partial Failure Of The Reactor Scram System	6/9/86	All BWRs and PWRs facilities holding an OL or CP
86-46	Improper Cleaning And Decontamination Of Respiratory Protection Equipment	6/12/86	All power reactor facilities holding an OL or CP and fuel fabrication facilities
86-45	Potential Falsification Of Test Reports On Flanges Manufactured By Golden Gate Forge And Flange, Inc.	6/10/86	All power reactor facilities holding an OL or CP and research and test facilities
86-44	Failure To Follow Procedures When Working In High Radiation Areas	6/10/86	All power reactor facilities holding an OL or CP and research and test reactors
86-43	Problems With Silver Zeolite Sampling Of Airborne Radioiodine	6/10/86	All power reactor facilities holding an OL or CP
86-42	Improper Maintenance Of Radiation Monitoring Systems	6/9/86	All power reactor facilities holding an OL or CP
86-41	Evaluation Of Questionable Exposure Readings Of Licensee Personnel Dosimeters	6/9/86	All byproduct material licensees

OL = Operating License  
 CP = Construction Permit