

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

December 10, 1996

**NRC INFORMATION NOTICE 96-64: MODIFICATIONS TO CONTAINMENT BLOWOUT
PANELS WITHOUT APPROPRIATE DESIGN
CONTROLS**

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 the potential for operating outside of the design basis as a result of modifying structures without appropriate design controls. 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

North Anna, Units 1 & 2

On February 13, 1996, it was identified that six blowout panels for both units' incore instrument tunnels had been modified by installing hasps and locks without appropriate design controls. Additionally, several steam generator and reactor coolant loop containment cubicle door panels had been modified by tack welding their sheet metal covers to the door frames and adding stiffener plates around the door handles. These modifications were not reviewed prior to installation to assure their compliance with design bases assumptions contained in the Updated Final Safety Analysis Report (UFSAR), and existed for an extended time period during past operating cycles.

Cooper

On November 21, 1995, it was recognized that the accident analysis for High Energy Line Break outside Primary Containment contained a key assumption that had been rendered invalid. For a postulated High Energy Line Break inside the Reactor Building Main Steam Tunnel (Steam Tunnel), the Steam Tunnel blowout panels had been credited with rupturing to allow a vent path to the Turbine Building, thereby preventing compartment overpressurization. In an effort to reduce Secondary Containment leakage, maintenance was performed on the blowout panels in 1985 to cover them with fiberglass. As a result, the blowout panels would rupture at a higher pressure than credited in the High Energy Line Break analysis. This was

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apparently attributable to an inadequate investigation of the blowout panels' design basis functions prior to the initiation of the maintenance.

Quad Cities

On May 10, 1996, a tornado caused structural damage to the metal siding that forms the secondary containment barrier for the refueling floors on both Units. Subsequent documented inspections revealed approximately 270 (out of 1496) damaged explosion bolts. It was observed that not all of the damaged bolts were a result of this tornado. On August 23, 1996, it was concluded, through calculations, that not all of the design requirements for the siding would have been met and this would have placed secondary containment in an inoperable condition. The previously damaged explosion bolts were damaged by either a pressure load or by ineffective work practices.

Nine Mile Point, Unit 1

On October 25, 1993, it was determined that the relief (blowout) panels in the Nine Mile Point Unit 1 turbine and reactor buildings would not blow out at the design pressure of 2.15 kph (45 lb/ft²) because the bolt fasteners for the panels were larger than designed and had a higher ultimate strength than designed. The initial engineering evaluation of this condition erroneously determined that the turbine and reactor building panels would blow out at 2.87 kph (60 lb/ft²) and 2.54 kph (53 lb/ft²), respectively, to relieve internal building pressure prior to structural failure of the buildings, and the panels were declared operable. On March 27, 1995, it was determined that there was an error in the design assumptions for load distribution. Revised calculations confirmed that the relief panels would not blow out until the internal building pressure exceeded the minimum documented building structural design of 3.83 kph (80 lb/ft²). The cause of this event was inadequate quality control measures during initial construction which resulted in oversize bolts being installed in the relief panels.

Discussion

The purpose of blowout panels is to prevent overpressure or overtemperature conditions in a compartment or other enclosure that could be structurally damaged due to a high energy line break inside the compartment, or that contains equipment that would be damaged by the overpressure or overtemperature condition. This function may or may not be a "safety-related" function depending on whether the high energy line break could result in loss of (1) the capability to reach and maintain safe shutdown, or (2) the capability to mitigate an accident in which a high energy line break is postulated to occur as a passive or consequential additional failure. In addition to the overpressure "active" function, blowout panels may also have a passive function such as tornado missile protection.

Blowout panels are designed to open at specific design differential pressures. Licensees discovered that as-found configurations either would not allow the panels to open until after exceeding the design pressure, or in the Quad Cities example, did not meet all of secondary containment design bases described in the UFSAR. Modifications made to satisfy apparently valid concerns did not adequately evaluate the effects on the panels' design bases or

adequately consider the design assumptions used for analyzing containment structures and supports. The modifications were not recognized as having the potential to place the structures outside of their design bases.

Previous Similar Generic Communication

NRC Information Notice 96-17, "Reactor Operations Inconsistent with the Updated Final Safety Analysis Report," dated March 18, 1996, (Accession No. 9603150213).

This information notice requires no written response. If you have any questions about the information in this notice, please contact the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation Project Manager.

References

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3. Quad Cities Nuclear Power Station Licensee Event Report 50-254 & 50-265/96-016, dated September 20, 1996, (Accession Number 9609300009)
4. Nine Mile Point Nuclear Station Unit 1 Licensee Event Report 50-220/95-005-01, dated June 26, 1996, (Accession Number 9607010370)

for 
Thomas T. Martin, Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

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96-62	Potential Failure of the Instantaneous Trip Function of General Electric RMS-9 Programmers	11/20/96	All holders of OLs and CPs for nuclear power plants
96-61	Failure of a Main Steam Safety Valve to Reseat Caused by an Improperly Installed Release Nut	11/20/96	All holders of OLs or CPs for nuclear power reactors
96-60	Potential Common-Mode Post-Accident Failure of Residual Heat Removal Heat Exchangers	11/14/96	All holders of OLs or CPs for nuclear power reactors
96-59	Potential Degradation of Post Loss-of-Coolant Recirculation Capability as a Result of Debris	10/30/96	All holders of OLs or CPs for nuclear power reactors
96-58	RCP Seal Replacement with Pump on Backseat	10/30/96	All holders of OLs or CPs for pressurized-water reactors

OL = Operating License
CP = Construction Permit

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original signed by D.B. Matthews
 Thomas T. Martin, Director
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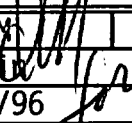

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meet all of the secondary containment design bases described in the UFSAR. Modifications made to satisfy apparently valid concerns did not adequately evaluate the effects on the panels' design bases or adequately consider the design assumptions used for analyzing containment structures and supports. The modifications were not recognized as having the potential to place the structures outside of their design bases.

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