

FILE

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, DC 20555

May 24, 1988

NRC INFORMATION NOTICE NO. 88-29: DEFICIENCIES IN PRIMARY CONTAINMENT
LOW-VOLTAGE ELECTRICAL PENETRATION
ASSEMBLIES

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees to potential problems resulting from the findings of a recent NRC environmental qualification (EQ) inspection concerning low-voltage penetration assemblies. 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 do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Braidwood 2. During an EQ inspection conducted by Region III from February 20, 1988 to March 4, 1988, a deficiency was discovered in test documentation for four penetration assemblies. Insulation resistance readings had not been taken frequently enough to determine the performance of the assemblies in testing to simulate conditions for a loss-of-coolant accident (LOCA). The first reading was taken between 8 and 20 hours into the test. These assemblies were manufactured by the Bunker Ramo Company.

In response to the finding, the licensee, Commonwealth Edison Company, provided a test report (Reference 1) from another plant to demonstrate that the configuration installed at Braidwood 2 is environmentally qualified. A review of this test report, however, showed that the insulation resistance readings were not taken at a frequency consistent with the guidance provided in the Institute for Electronic and Electrical Engineers (IEEE) Standard 323-1974.

Discussion:

These electrical penetrations are designed to carry some 75 electrical signals from instrumentation inside the containment to main control room indicators and

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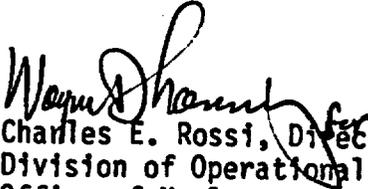
protective circuitry while maintaining the integrity of the containment pressure boundary. The deficiency described above relates to the quality of the signal transmission of the assemblies, not to their pressure-retaining capabilities.

The specific instruments involved provide inputs to the reactor protection system and the engineered safety features actuation system as well as providing certain post-accident monitoring functions. Some of those functions are required to mitigate a LOCA, a main feedwater line break, and a main steam line break. These are the design basis accidents that produce the harsh environments the penetration must withstand. During accident conditions, failure of these assemblies could affect the accuracy of Class 1E instruments and thus mislead operators.

Instrumentation required to mitigate the consequences of design basis accidents typically operates on 4 to 20 milliamps; therefore, cable insulation resistance is essential for the accuracy of these instruments. The qualification information provided by the licensee did not have cable insulation resistance readings taken frequently enough to determine the performance of the penetration assemblies under LOCA simulation testing. Thus, environmental qualification for these assemblies has not been demonstrated (Reference 2).

A generic communication addressing similar equipment has been issued previously (Reference 3).

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


Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contacts: Raj Anand, NRR
(301) 492-0805

Vern Hodge, NRR
(301) 492-1169

Attachment: List of Recently Issued NRC Information Notices

References

1. Midland Containment Penetration Environmental Qualification Test Report No. 123-2201, Revision A, February 1979, Docket 329/330. A copy of this report is available in the NRC Public Document Room 1717 H Street, N.W., Washington, D.C. 20555 for inspection and copying.
2. NRC Generic Letter No. 88-07, "Modified Enforcement Policy Relating to 10 CFR 50.49, 'Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants,'" April 7, 1988
3. NRC Bulletin No. 82-04, "Deficiencies in Primary Containment Electrical Penetration Assemblies," December 3, 1982

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-28	Potential for Loss of Post-LOCA Recirculation Capability Due to Insulation Debris Blockage	5/19/88	All holders of OLS or CPs for nuclear power reactors.
88-27	Deficient Electrical Terminations Identified in Safety-Related Components	5/18/88	All holders of OLS or CPs for nuclear power reactors.
85-35, Supplement 1	Failure of Air Check Valves to Seat	5/17/88	All holders of OLS or CPs for nuclear power reactors.
88-26	Falsified Pre-Employment Screening Records	5/16/88	All holders of OLS or CPs for nuclear power reactors and all major fuel facility licensees.
88-25	Minimum Edge Distance for Expansion Anchor Bolts	5/16/88	All holders of OLS or CPs for nuclear power reactors.
88-24	Failures of Air-Operated Valves Affecting Safety-Related Systems	5/13/88	All holders of OLS or CPs for nuclear power reactors.
88-23	Potential for Gas Binding of High-Pressure Safety Injection Pumps During a Loss-of-Coolant Accident	5/12/88	All holders of OLS or CPs for PWRs.
88-22	Disposal of Sludge from Onsite Sewage Treatment Facilities at Nuclear Power Stations	5/12/88	All holders of OLS or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

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protective circuitry while maintaining the integrity of the containment pressure boundary. The deficiency described above relates to the quality of the signal transmission of the assemblies, not to their pressure-retaining capabilities.

The specific instruments involved provide inputs to the reactor protection system and the engineered safety features actuation system as well as providing certain post-accident monitoring functions. Some of those functions are required to mitigate a LOCA, a main feedwater line break, and a main steam line break. These are the design basis accidents that produce the harsh environments the penetration must withstand. During accident conditions, failure of these assemblies could affect the accuracy of Class 1E instruments and thus mislead operators.

Instrumentation required to mitigate the consequences of design basis accidents typically operates on 4 to 20 milliamps; therefore, cable insulation resistance is essential for the accuracy of these instruments. The qualification information provided by the licensee did not have cable insulation resistance readings taken frequently enough to determine the performance of the penetration assemblies under LOCA simulation testing. Thus, environmental qualification for these assemblies has not been demonstrated (Reference 2).

A generic communication addressing similar equipment has been issued previously (Reference 3).

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Attachment: List of Recently Issued NRC Information Notices

*SEE PREVIOUS CONCURRENCES	*AD:DEST:NRR ATHadani 05/18/88	D/DOEA NRR CERossi 05/18/88	*C/OGCB:DOEA:NRR CHBerlinger 05/18/88
*OGCB:DOEA:NRR CVHodge 05/17/88	*SPLB:DEST:NRR RAnand 05/18/88	*AC/SPLB:DEST:NRR JWCraig 05/18/88	*D/DEST:NRR LCShao 05/18/88
			*PPMB:ARM TechEd 05/17/88

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*OGCB:DOEA:NRR
CVHodge
05/17/88

R. Anand
SPLB:DEST:NRR
RAnand
05/18/88

JWCraig
AC/SPLB:DEST:NRR
JWCraig
05/16/88

AT SPLB
A. Thompson
D/DOEA:NRR
CERossi
05/ /88
D/DEST:NRR
LCShao
05/17/88

CHB
C/OGCB:DOEA:NRR
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TechEd
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