

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

March 3, 1989

**NRC INFORMATION NOTICE NO. 89-23: ENVIRONMENTAL QUALIFICATION OF LITTON-VEAM
CIR SERIES ELECTRICAL CONNECTORS**

Addressees:

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

Purpose:

This information notice is being provided to alert addressees to a potentially generic safety problem involving CIR series electrical connectors manufactured by the Veam Division of Litton Industries. These connectors have been supplied to numerous commercial nuclear plants by Combustion Engineering, Inc. (CE), and have been obtained by at least three plants through other channels.

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:

Litton-Veam CIR series multi-pin electrical connectors are used in core exit thermocouple (CET) and reactor vessel level monitoring (RVLM) systems supplied to numerous plants by Combustion Engineering, Inc., and are used in other applications in at least three additional plants. A proprietary qualification test report (CE NPSD-230-P) has been used to document environmental qualification of the connectors for loss of coolant accident (LOCA) conditions in the CE-supplied systems. During LOCA testing, the connector face seal gasket was completely degraded and elastomeric inserts interacted with simulated containment spray solution which leaked into the connector. Insulation resistances near 1,000 ohms were measured. CE has performed analyses to show that resultant errors are acceptable in CE-supplied CET and RVLM system thermocouple circuits. However, the moisture ingress and resultant low insulation resistances are not acceptable for heater circuits in the RVLM. For that application, CE developed two remedies; one is a clamp, and the other is a new connector design. CE has advised that one of these remedies has been used for all of the RVLM heater circuits. Unmodified CIR connectors are believed to be still in use in other applications.

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IDR-11C

Details of this concern, including a list of plants believed to be affected, are contained in NRC Inspection Report 99900401/88-01, dated January 10, 1989.

Discussion:

CE LOCA-tested the Litton-Veam connectors only in thermocouple circuits, which tolerate relatively poor electrical characteristics. In other applications such as transmitter and solenoid valve circuits, licensees are cautioned that CE's testing (1) does not establish qualification and (2) strongly suggests qualification problems. Connector failures could result in the loss of the functions of connected qualified equipment.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact 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 Contact: Richard C. Wilson, NRR

(301) 492-0997

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
89-22	Questionable Certification of Fasteners	3/3/89	All holders of OLs or CPs for nuclear power reactors.
89-21	Changes in Performance Characteristics of Molded-Case Circuit Breakers	2/27/89	All holders of OLs or CPs for nuclear power reactors.
88-73, Supplement 1	Direction-Dependent Leak Characteristics of Containment Purge Valves	2/27/89	All holders of OLs or CPs for nuclear power reactors.
89-20	Weld Failures in a Pump of Byron-Jackson Design	2/24/89	All holders of OLs or CPs for nuclear power reactors.
89-19	Health Physics Network	2/23/89	All holders of OLs or CPs for nuclear power reactors, and the following fuel facilities: Nuclear Fuel Services of Erwin, General Atomic, UNC Montville, B&W LRC Lynchburg, and B&W Lynchburg.
89-18	Criminal Prosecution of Wrongdoing Committed by Suppliers of Nuclear Products or Services	2/22/89	All holders of OLs or CPs for nuclear power reactors.
89-17	Contamination and Degradation of Safety-Related Battery Cells	2/22/89	All holders of OLs or CPs for nuclear power reactors.
89-16	Excessive Voltage Drop in dc Systems	2/16/89	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
 CP = Construction Permit

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Discussed changes to final draft with W. Brach on 2/24/89. W. Brach also verified that information in this notice is from the inspection report and the inspection report was reviewed by CE to ensure no proprietary info was released.
E. Rossi

*SEE PREVIOUS CONCURRENCE PAGE

VIB:DRIS*	SC:VIB:DRIS*	TECH EDITOR*	BC:VIB:DRIS*	D:DRIS*	BC:SPLB:DES*
RCWilson:jh	UPotapovs		EWBrach	BKGrimes	JCraig
02/17/89	02/21/89	02/17/89	02/21/89	02/22/89	02/23/89
BC:GCB*	D:DOEA				
CBerlinger	CERossi				
02/27/89	02/24/89				

Discussion:

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02/21/89

TECH EDITOR*

02/17/89

BC:MB:DRIS
EWBrach
02/21/89

D:DRIS
EKerimes
02/22/89

BC:SPLB:DES
for JCraig
02/23/89

BC:GCB *CMB*
CBerlinger
02/27/89

D:DOEA
CERossi
03/ /89

2/22
mge

Discussion:

CE LOCA-tested the Litton-Veam connectors only in thermocouple circuits, which tolerate relatively poor electrical characteristics. ~~Even in thermocouple circuits, licensees may wish to consider changing to connectors that do not suffer damage and moisture ingress during LOCA conditions.~~ In other applications such as transmitter and solenoid valve circuits, licensees are cautioned that CE's testing (1) does not establish qualification and (2) strongly suggests qualification problems. Connector failures could result in the loss of the functions of connected qualified equipment.

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BC:ESPLB:DES
J Craig



RCW
VIB:DRIS
RCWilson:jh
02/17/89

UP
SC:VIB:DRIS
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02/21/89

RCW for
TECH EDITOR
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