

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

February 24, 1989

NRC INFORMATION NOTICE NO. 89-20: WELD FAILURES IN A PUMP OF BYRON-JACKSON DESIGN

Addressees:

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

Purpose:

This information notice alerts addressees to weld failures in a primary loop recirculation pump of Byron-Jackson design experienced by owners of boiling water reactors (BWRs) in a foreign country. 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:

The following information is related to boiling water reactors; however, the nature of the weld failures was such that potentially all pumps of similar design could be affected.

1. In 1984, a foreign BWR experienced a failure in the attachment weld of a ring that surrounds the bearing housing component of a pump manufactured by Byron-Jackson but fabricated and assembled by a foreign company. The power company operating the BWR performed repairs using fillet welds applied at the failed locations. During inspections in 1988 cracks were found at the same weld locations in both recirculation pumps. The repair involved applying full penetration butt welds with some axial realignment of the ring.
2. Similar problems were recently reported at another BWR plant in the same country in which the first event took place. Significant vibration was observed during a normal end-of-cycle coastdown for annual maintenance. The plant was immediately shut down for inspection. It was found that the ring and impeller had broken, and some fasteners were found in various sections of the recirculation loop.

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3. As a result of the 1984 and 1988 incidents, owners of BWRs in the foreign country began a program of inspection and repair using the full penetration welds and realignment of the ring. The unit that experienced the broken ring and impeller had not yet been inspected for deficiencies in the welding before the failure occurred. As a result of the failure, one of seven other units of a similar power level was shut down because it had not been inspected or repaired.

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*

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

Technical Contacts: N. Prasad Kadambi, NRR  
(301) 492-1153

P. T. Kuo, NRR  
(301) 492-0907

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED  
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
89-19	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.
89-15	Second Reactor Coolant Pump Shaft Failure at Crystal River	2/16/89	All holders of OLs or CPs for nuclear power reactors.
89-14	Inadequate Dedication Process for Commercial Grade Components Which Could Lead to Common Mode Failure of a Safety System	2/16/89	All holders of OLs or CPs for nuclear power reactors.
89-13	Alternative Waste Management Procedures in Case of Denial of Access to Low-Level Waste Disposal Sites	2/8/89	All holders of NRC specific licenses.
89-12	Dose Calibrator Quality Control	2/9/89	All NRC medical licensees.

OL = Operating License  
 CP = Construction Permit

3. As a result of the 1984 and 1988 incidents, owners of BWRs in the foreign country began a program of inspection and repair using the full penetration welds and realignment of the ring. The unit that experienced the broken ring and impeller had not yet been inspected for deficiencies in the welding before the failure occurred. As a result of the failure, one of seven other units of a similar power level was shut down because it had not been inspected or repaired.

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OGCB:DOEA:NRR* NPKadambi 2/16/89	EMB:DEST:NRR* PTKuo 2/9/89	GPA:IP* KBurke 2/10/89	EMEB:DEST:NRR* LBMarsh 2/13/89	EMTB:DEST:NRR* CYCheng 2/13/89
TECH ED* BCalure 2/17/89	EAD:DEST:NRR* JERichardson 2/13/89	D:DEST:NRR* LCShao 2/14/89	C:OGCG:DOEA:NRR* CHBerlinger 2/15/89	D:DOEA:NRR CERossi 2/17/89

3. As a result of the 1984 and 1988 incidents, owners of BWRs in the foreign country began a program of inspection and repair using the full penetration welds and realignment of the ring. The unit that experienced the broken ring and impeller had not yet been inspected for deficiencies in the welding before the failure occurred. As a result of the failure, one of seven other units of a similar power level was shut down because it had not been inspected or repaired.

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NPKadambi  
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NRR:DOEA NPKadambi:dd 2/16/89	EMEB:DEST* PTKuo 2/ /89	GPA:IP* KBurke 2/ /89	EMEB:DEST* LBMarsh 2/ /89	EMTB:DEST* CYCheng 2/ /89
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\* See previous concurrence.

(c) As a result of the 1984 and 1988 incidents, BWRs in the foreign country began a program of inspection and repair using the full penetration welds and realignment of the ring. The unit which experienced the broken ring had not yet been inspected for this purpose before the failure occurred. As a result of the failure, one of the seven other units of similar power level was shut down because it had been neither inspected nor repaired.

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.

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\*SEE PREVIOUS CONCURRENCE

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NPKadambi:dd  
2/9/89

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2/13/89

ADAM:DFIPS  
B.A. Calure  
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\*EMEB:DEST  
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D:DEST  
LCShao  
2/14/89

\*GPA:IP  
KBurke  
2/10/89

DOEA:GCB  
CBerlinger  
2/15/89

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EMEB:DEST  
LBMarsh  
2/13/89

NRR:DOEA  
CERossi  
2/ /89

*all*  
EMEB:DEST  
CYCheng  
2/13/89

(c) As a result of the 1984 and 1988 incidents, BWRs in the foreign country began a program of inspection and repair using the full penetration welds and realignment of the ring. The unit which experienced the broken ring had not yet been inspected. As a result of the failure, other units of similar power level will either be shut down for immediate inspection, or be repaired during the next scheduled inspections. Those of similar design but different power levels have adopted administrative procedures to ensure early detection of similar problems.

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