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

November 6, 1980

IE BULLETIN NO. 80-21: VALVE YOKES SUPPLIED BY MALCOLM FOUNDRY COMPANY, INC.

Description of Circumstances:

On June 17, 1980, Pennsylvania Power and Light Company notified IE Region I that cracks had been discovered in the yokes of a number of valves in the residual heat removal (RHR) system at their Susquehanna Steam Electric Station. The potential for common-mode failure of the yokes on several valves in redundant, safety-related trains of the RHR system constitutes a failure mode whereby all RHR functions could be simultaneously lost. Specifically, the cracks were located in the radii at the yoke mounting flange-to-yoke vertical section interface.

An analysis and evaluation of the most severely cracked valve yoke was performed by the valve manufacturer, Anchor Darling Valve Company. They concluded that the cracking was not due to casting defects, but rather was due to the yoke material not having the proper mechanical properties. Purchased as ASTM A-216, Grade WCB material, the actual valve yoke material had tensile and yield strengths below the minimum values listed in the ASTM material specification. The cracked valve yokes were all cast by Malcolm Foundry Company, Inc., of Newark, New Jersey. The foundry is no longer in business.

Anchor Darling has begun a program of verifying the tensile strengths of the other valve yokes cast by Malcolm and used on Anchor Darling valves at Susquehanna. To date, approximately half of the valve yokes have been tested. Of those tested, over 25 percent of the valve yokes have revealed Brinell hardness values significantly below the appropriate value obtained from the approximate relationship of Brinell hardness to tensile strength included in ASTM Specification A-370. These additional valve yokes are on a wide range of valve sizes and are from a number of different purchase orders placed with Malcolm over a period of at least ten months during 1974 and 1975. Thus, it appears that the problem is not isolated to one heat of material or to one short time period. Anchor Darling intends to replace the defective valve yokes at Susquehanna and to begin a testing program at other nuclear power plants under construction where valves with valve yokes cast by Malcolm have been provided.

Since Malcolm Foundry Company, Inc., is no longer in business, the NRC staff cannot determine directly if Malcolm has provided valve parts to other valve manufacturers for use in nuclear power plants.

Actions To Be Taken by Addressees:

For all power reactor licensees or holders of construction permits the following actions are required:

1. Determine if any of the active valves in use or planned for use in safety-related systems at your facility have valve parts cast by Malcolm Foundry Company, Inc. If no valves are identified as having potentially faulty material, indicate that this is the case and ignore the remaining questions.
2. Licensees having active safety-related valves with potentially faulty material shall immediately visually inspect for cracks all normally accessible valve parts (i.e., those which can be inspected during reactor operation).
3. Licensees or permit holders having active safety-related valves with potentially faulty material shall identify the manufacturer(s) of these valves and either:
 - a. Verify that all valve parts cast by Malcolm have mechanical properties in accordance with the ASTM material specification; if such is not the case, then comply with either b. or c. below also.
 - b. Replace the defective materials and/or valves.
 - c. Identify any other corrective actions that may be exercised and the basis for such actions.

For plants with an operating license, the results of your initial determination (item 1), visual inspection results (item 2), a list of affected valve manufacturers, your planned action (item 3), and the schedule for accomplishing this action shall be reported within thirty days of the date of this bulletin to the Director of the appropriate NRC Regional Office with a copy sent to the NRC Office of Inspection and Enforcement, Division of Reactor Construction Inspection, Washington, DC 20555.

For plants with a construction permit, the results of your initial determination (item 1), a list of affected valve manufacturer(s), your planned action (item 3) and the schedule for accomplishing this action shall be reported within sixty days of the date of this bulletin to the Director of the appropriate NRC Regional Office with a copy sent to the NRC Office of Inspection and Enforcement, Division of Reactor Construction Inspection, Washington, DC 20555.

Compliance with this bulletin by the licensees does not relieve the affected valve manufacturers from the reporting requirements of 10 CFR Part 21.

If you desire additional information regarding this matter, please contact the appropriate IE Regional Office.

Approved by GAO, B180225 (R0072); clearance expires November 30, 1980. Approval was given under a blanket clearance specifically for identified generic problems.

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Bulletin No.	Subject	Date Issued	Issued To
Supplement 3 to 79-10B	Environmental Qualification of Class 1E Equipment	10/24/80	All power reactor facilities with an OL
Supplement 2 to 79-01B	Environmental Qualification of Class 1E Equipment	9/30/80	All power reactor facilities with an OL
80-22	Automation Industries, Model 200-520-008 Sealed-source Connectors	9/11/80	All radiography licensees
79-26 Revision 1	Boron Loss from BWR Control Blades	8/29/80	All BWR power facilities with an OL
80-20	Failures of Westinghouse Type W-2 Spring Return to Neutral Control Switches	7/31/80	To each nuclear power facility in your region having an OL or a CP
80-19	Failures of Mercury-Wetted Matrix Relays in Reactor Protective Systems of Operating Nuclear Power Plants Designed by Combustion Engineering	7/31/80	All nuclear power facilities having either an OL or a CP
80-18	Maintenance of Adequate Minimum Flow Thru Centrifugal Charging Pumps Following Secondary Side High Energy Line Rupture	7/24/80	All PWR power reactor facilities holding OLs and to those PWRs nearing licensing
Supplement 2 to 80-17	Failures Revealed by Testing Subsequent to Failure of Control Rods to Insert During a Scram at a BWR	7/22/80	All BWR power reactor facilities holding OLs
Supplement 1 to 80-17	Failure of Control Rods to Insert During a Scram at a BWR	7/18/80	All BWR power reactor facilities holding OLs
80-17	Failure of Control Rods to Insert During a Scram at a BWR	7/3/80	All BWR power reactor facilities holding OLs