

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

September 25, 1992

NRC INFORMATION NOTICE 92-70: WESTINGHOUSE MOTOR-OPERATED VALVE PERFORMANCE
DATA SUPPLIED TO NUCLEAR POWER PLANT LICENSEES

Addressees

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

Purpose

The U.S. Nuclear Regulatory Commission is issuing this information notice to alert addressees to the possibility of overestimating the thrust capability of motor-operated valve (MOV) actuators when using performance data from valve manufacturers. 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.

Background

Many nuclear power plant licensees have concluded that more thrust than was originally predicted is often required to open or close many valves under differential pressure and flow conditions. They have made this conclusion upon receiving plant experience and analyses associated with the activities for resolving the issues discussed in Generic Letter 89-10 (June 28, 1989), "Safety-Related Motor-Operated Valve Testing and Surveillance," and its supplements. Licensees have also found that in many cases the Limitorque Corporation's typical guidelines indicate that the MOV actuator would not be able to produce the required thrust.

Description of Circumstances

To overcome these calculated thrust deficiencies, some licensees are attempting to use less conservative stall thrust data to justify MOV capability. For example, the Wolf Creek Nuclear Operating Corporation, the licensee of the Wolf Creek Generating Station, used stall thrust data provided by the Westinghouse Electric Corporation. However, the MOVs were later found to be unable to deliver the stated thrust.

On July 7 to 9, 1992, the NRC Vendor Inspection Branch conducted an inspection at Westinghouse to review the basis for the MOV thrust data given to the nuclear industry. During this inspection, the team determined that

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Westinghouse has supplied licensees with stall thrust data based on tests performed for Westinghouse by Limatorque as part of the procurement process. As noted in NRC Inspection Report 99900404/92-01 (August 14, 1992) the NRC team found a number of factors that can reduce the thrust delivered by the actuator that were not addressed in the testing for Westinghouse. Examples that the staff found included:

1. Limatorque performed the tests of actuator thrust capability under static (no load) conditions. Therefore, the actuator thrust output did not reflect load sensitive behavior (also referred to as the rate of loading effect) which has been observed to reduce the thrust delivered by an actuator when the valve is operated against differential pressure and flow conditions.
2. In testing the actuator, Limatorque did not determine the stem friction coefficient, which must be considered in calculating the conversion of torque produced by an actuator to the thrust delivered in operating the valve. If the actual stem friction coefficient for an MOV installed in a nuclear power plant is greater than the stem friction coefficient during the Limatorque tests, the actuator would produce less thrust when installed than claimed by the valve supplier. Stem lubrication conditions can significantly affect the stem friction coefficient. During the Limatorque testing, valve stem lubrication was not controlled.
3. In its documentation of the actuator tests, Limatorque did not discuss the inaccuracies of the test equipment or uncertainties in reading test data.
4. Limatorque conducted the actuator tests under mild ambient conditions and did not address the degree to which the thrust output might be reduced if the MOV is located in a high temperature environment.

Discussion

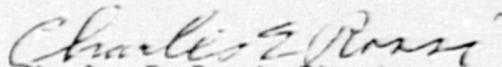
Stall thrust testing during procurement of an actuator does not address all of the factors that may affect the capability of the actuator to operate its valve when installed in a nuclear power plant. Licensees may overestimate the capability of actuators to operate valves if the licensees use stall test data, such as those supplied by Westinghouse, without considering all factors affecting operability. Overestimation of the capability of an actuator can lead to incorrectly concluding that an MOV is operable and capable of performing its safety function.

Related Generic Communications

The NRC has issued other generic communications describing information or actions by vendors and suppliers that, unless adequately verified by licensees, can affect the operability of MOVs in nuclear power plants. For example, the NRC issued Information Notices 91-61 (September 30, 1991), "Preliminary Results of Validation Testing of Motor-Operated Valve Diagnostic Equipment," and IN 92-23 (March 27, 1992), "Results of Validation Testing of Motor-Operated Valve Diagnostic Equipment," to alert licensees to the results

of a testing program by the MOV Users Group of nuclear power plant licensees that revealed that certain MOV diagnostic equipment did not meet the accuracy claims of its vendors.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.



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Attachment: List of Recently Issued NRC Information Notices

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LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
92-69	Water Leakage from Yard Area Through Conduits Into Buildings	09/22/92	All holders of OLS or CPs for nuclear power reactors.
91-29, Supp. 1	Deficiencies Identified During Electrical Distribution System Functional Inspections	09/14/92	All holders of OLS or CPs for nuclear power reactors.
92-68	Potentially Substandard Slip-On, Welding Neck, and Blind Flanges	09/10/92	All holders of OLS or CPs for nuclear power reactors.
92-67	Deficiency in Design Modifications to Address Failures of Hiller Actuators Upon A Gradual Loss of Air Pressure	09/10/92	All holders of OLS or CPs for nuclear power reactors.
92-66	Access Denied to NRC Inspectors at Five Star Products, Inc. and Construction Products Research, Fairfield, Connecticut	09/01/92	All holders of OLS or CPs for nuclear power reactors and all recipients of NUREG-0040, "Licensee, Contractor and Vendor Inspection Status Report" (White Book).
92-65	Safety System Problems Caused by Modifications That Were Not Adequately Reviewed and Tested	09/03/92	All holders of OLS or CPs for nuclear power reactors.
92-64	Nozzle Ring Settings on Low Pressure Water-Relief Valves	08/28/92	All holders of OLS or CPs for nuclear power reactors.
92-63	Cracked Insulators in ASL Dry Type Transformers Manufactured by Westinghouse Electric Corporation	08/26/92	All holders of OLS or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

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