

# LIS ORIGINAL

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IN 86-56

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

July 10, 1986

IE INFORMATION NOTICE NO. 86-56: RELIABILITY OF MAIN STEAM SAFETY VALVES

Addressees:

All pressurized-water reactor facilities holding an operating license or construction permit.

Purpose:

This information notice (IN) is provided as additional notification of NRC's concern for the reliability of spring-actuated main steam safety valves following reports of multiple failures during testing and problems during power operations and scram recovery. IN 86-05, "Main Steam Safety Valve Test Failures and Ring Setting Adjustments," previously addressed the problem of inadequate flow capacity of these valves.

It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude similar problems from occurring at their facilities. However, suggestions contained in this notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

While researching IN 86-05, the following problems with main steam safety valves (MSSVs) that had occurred during testing, power operations, or scram recovery were tabulated from the licensee event report files.

MAIN STEAM SAFETY VALVE PROBLEMS (01/01/81-03/01/86)

PROBLEM	NUMBER VALVES	NUMBER PLANTS	TESTING (EVENTS)	POWER (EVENTS)	POST-SCRAM (EVENTS)
FAILURE TO OPEN	13	6	5	0	1
FAILURE TO RECLOSE	15	9	2	1	8
SPURIOUS OPENING	6	4	2	3	1
LEAKING	7	4	1	3	0
SET POINT DRIFT					
HIGH	44	10	11	0	1
LOW	97	14	18	3	3
UNSPECIFIED	75	11	14	0	0

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A number of reports have been received concerning events involving MSSVs. Four of the more significant reports are summarized in this and the following paragraphs. At North Anna 2, 8 of 15 valves would not lift at the maximum pressure available to the testing device at the site (1147 to 1161 psig). All 15 valves were subsequently sent to Wyle Laboratories for further testing. The as-found setpoints varied from 1105 to 1223 psig compared with the specified  $1085 \pm 11$  to  $1135 \pm 11$  psig setpoints. All valves were refurbished and setpoints were adjusted to be within technical specification limits (LER 50/339-86/001).

Salem 2 reported one valve leaking during heatup following a refueling outage. After the spindle nut was backed away from the forked lever, the valve reseated, but later it lifted and did not immediately reseat. It was gagged shut. Subsequently two other valves prematurely lifted. They too were gagged shut. Later, when a fourth valve lifted, it was declared inoperable. All 20 MSSVs were then tested and reset to the appropriate setpoints. The licensee was unable to determine the cause for the setpoint drift (LER 50/311-85-007).

Oconee 2 reported that 2 MSSVs had failed to reseat promptly. They reseated at 900 psig instead of 1010 psig following a transient that included a reactor scram (LER 50/270-85/006).


On October 19, 1985, the 16 MSSVs of Calvert Cliffs Unit 2 were tested to check and, if required, to adjust the relief pressure setpoints. Unit 2 contains 2 steam generators, each with 8 MSSVs on a steam header. Eleven of the 16 valves were determined to be out of specification, with the as-found setpoints between 22 to 69 psi higher than their nominal setpoints, compared with the technical specification requirement of  $\pm 10$  psi. The Licensee Event Report is included in this notice as Attachment 1 to give an example of the problems found during testing, and because it is an especially thorough treatment of corrective actions that may be of value to other facilities.

#### Discussion:

The safety significance of failure of the MSSVs to open on a PWR is a potential for over-pressurizing the secondary system with a possibility of a loss of its pressure boundary integrity. Failure to reclose has led to overcooling transients and lower-than-normal water levels in the steam generator. Spurious opening, usually at power, has led to reactor scrams. Leaking valves tend to have more problems than properly functioning valves. Setpoint drift-low may cause spurious opening of the valves and may interact synergistically with a steam generator tube rupture to cause relief through the faulted steam generator in the case where the MSSVs on the faulted steam generator have lower-than-required setpoints. Setpoint drift-high can cause secondary pressure to rise above the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code-specified system pressure limit.

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

  
Edward L. Jordan, Director  
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and Engineering Response  
Office of Inspection and Enforcement

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Attachments:

1. LER 50/312-85/011
2. Recently Issued IE Information Notices