

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, DC 20555-0001

January 5, 1996

NRC INFORMATION NOTICE 96-03: MAIN STEAM SAFETY VALVE SETPOINT VARIATION AS A RESULT OF THERMAL EFFECTS

Addressees

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

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to a possible source of variation in the setpoints of various safety valves as a result of changes in temperature in and around the valves. 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.

Description of Circumstances

On September 22, 1995, with the reactor at approximately 83 percent power in a coast-down before a scheduled refueling outage, the licensee for Arkansas Nuclear One, Unit 2 (ANO-2), began testing the ANO-2 main steam safety valves (MSSVs) in place using a setpoint testing assist device. The first valve was tested up to a simulated pressure of 6.1 percent above the nominal setpoint, but did not lift. The licensee stopped testing and reviewed the procedures before resuming further testing. The next valve tested lifted at 4.3 percent above its nominal setpoint, and the subsequent valve would not lift at 5.9 percent above its nominal setpoint. The licensee stopped in situ testing, and, following a reactor cooldown, all 10 MSSVs were removed and shipped to Wyle Laboratories for testing and/or refurbishment. The ANO-2 MSSVs are model HA-65-FN manufactured by Crosby Valve and Gauge Company.

On September 30, 1995, Wyle tested one of the valves with full-pressure steam which the licensee had been unable to lift with the in situ testing. The valve lifted at 0.97 percent above its nominal setpoint, which is within the -3 percent, +1 percent tolerance required by the plant Technical Specifications. The licensee personnel on site at Wyle investigated the discrepancy between the two test results. The licensee determined that the setpoint difference between the two methods appeared to be caused by the

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difference in the thermal environments in which the valve was tested. The in situ test at the plant was performed with the valve uninsulated with an ambient air temperature of approximately 35 °C (95 °F). The Wyle test was performed with the valve insulated in an environmental box at an ambient environment of 60 °C (140 °F). When the valve was retested at Wyle under a simulated ANO-2 environment (including lack of insulation), the safety valve lifted at 5.7 percent above the nominal setpoint, which was similar to the results observed during the in situ testing. Wyle then proceeded to test all of the MSSVs using simulated ANO-2 thermal environmental conditions. Five of the 10 valves failed to meet the setpoint tolerance required by Technical Specifications including two valve setpoints that exceeded +6 percent of their nominal setpoints. Since the MSSV setpoints exceeded the allowable tolerance in the Technical Specifications, the licensee performed an analysis and determined that using actual as-found setpoint values, the MSSVs could have provided adequate overpressure protection during all design-basis events to prevent the peak primary and secondary system pressures from exceeding 110 percent of the system design pressures.

Additional information regarding the MSSV test results discussed above is provided in Licensee Event Report (LER) 95-005 submitted for the ANO-2 facility.

Discussion

In discussions with the NRC, testing personnel at Wyle indicated that they use a default set of thermal environmental conditions unless the customer provides other guidance. They also indicated that the licensees approve the test procedures before they are implemented. Wyle further indicated that, historically, most plants have not provided requirements for simulating the plant thermal environmental conditions, but that recently more plants have provided detailed thermal environmental requirements. Many licensees are committed to American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME) OM-1987 Part 1, "Requirements for In-service Performance Testing of Nuclear Power Plant Pressure Relief Devices," which requires that the ambient temperature of the operating environment shall be simulated during the set pressure test.

The testing that was performed for the ANO-2 MSSVs indicates that safety valve setpoints can vary significantly in response to thermal environmental conditions and that the magnitude of the setpoint effects can vary from valve to valve.

Related Generic Communications

Thermal environmental effects on safety valve setpoints have been discussed in the following NRC generic communications:

- NRC Information Notice 93-02: "Malfunction of a Pressurizer Code Safety Valve"

- NRC Information Notice 89-90, Supplement 1: "Pressurizer Safety Valve Lift Setpoint Shift"

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.


Dennis M. Crutchfield, Director
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Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
96-02	Inoperability of Power-Operated Relief Valves Masked by Downstream Indications During Testing	01/05/96	All holders of OLs or CPs for PWRs
96-01	Potential for High Post-Accident Closed-Cycle Cooling Water Temperatures to Disable Equipment Important to Safety	01/03/96	All holders of OLs or CPs for PWRs
95-58	10 CFR 34.20; Final Effective Date	12/18/95	Industrial Radiography Licensees
95-57	Risk Impact Study Regarding Maintenance During Low-Power Operation and Shutdown	12/18/95	All holders of OLs or CPs for nuclear power reactors.
95-56	Shielding Deficiency in Spent Fuel Transfer Canal at a Boiling-Water Reactor	12/11/95	All holders of OLs or CPs for nuclear power reactors.
95-55	Handling Uncontained Yellowcake Outside of a Facility Processing Circuit	12/06/95	All Uranium Recovery Licensees.
95-54	Decay Heat Management Practices during Refueling Outages	12/01/95	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

- NRC Information Notice 89-90, Supplement 1: "Pressurizer Safety Valve Lift Setpoint Shift"

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Attachments filed in Jacket

Tech Editor Reviewed 11/28/95

OFFICE	EMEB/RGN IV/PECB	C/EMEB:DE	C/PECB:DRPM	D/DRPM
NAME	Contacts*	RWessman*	AChaffee*	<i>DCrutchfield</i>
DATE	12/27/95	12/01/95	12/8/95	1/13/96

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DATE	<i>12/27/95</i>	12/01/95	12/8/95	/ /95

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DOCUMENT NAME: G:\JRT\ANO2.IN

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OFFICE	C/EMEB:DE	C/PECB:DRPM	D/DRPM
NAME	RWessman	AChaffee	DCrutchfield
DATE	12/1/95	/ /95	/ /95

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