

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

November 25, 1991

NRC INFORMATION NOTICE 91-75: STATIC HEAD CORRECTIONS MISTAKENLY NOT INCLUDED
IN PRESSURE TRANSMITTER CALIBRATION PROCEDURES

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 recent problems that have been identified with the calibration of pressure transmitters. 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

Recent problems have been identified with the calibration of pressure transmitters that affect safety-related systems. On July 3, 1991, the licensee for the Vogtle Electric Generating Plant discovered that a static head correction of approximately 25 psig had not been applied during the calibration of the pressurizer pressure transmitters for both units (LER 50-424/91-05). All four channels of pressurizer pressure instrumentation on each unit were affected. This correction factor affected the high and low pressurizer pressure reactor trip setpoints, the low pressurizer pressure safety injection setpoint, and the initial pressure used in the safety analyses. The licensee reviewed the effect of this condition on its safety analyses for a large break loss-of-coolant accident (LOCA), a small break LOCA, a steam generator tube rupture, LOCA events that are not related to the departure-from-nucleate boiling (DNB) phenomenon, and other non-LOCA events. It found inadequate margin only for the safety analysis of the small break LOCA. However, the licensee determined that the conservative assumptions in the small break LOCA safety analysis would provide sufficient margin to accommodate the lack of static head correction. It corrected the situation by recalibrating all eight pressurizer pressure transmitters. The licensee also determined that 58 other instruments had no head correction, although none of these were as safety significant. All of the above errors existed since initial startup for each unit.

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PDR I&E Notice 91-075 911125

updated on 12-3-91

On April 18, 1991, an engineer at the William B. McGuire Nuclear Station noticed that the three pressure transmitters for the suction piping of the turbine-driven auxiliary feedwater (TDAFW) pump were at a different elevation than the associated flow element. The licensee reviewed the associated procedures and found that it had made an error in compensating for the water leg when calibrating the pressure transmitters. The three pressure transmitters must be calibrated such that when the pressure decreases in the piping system, a signal is sent to automatically open the isolation valves for the ensured water source (the nuclear service water system). The licensee tested the as-found setpoints and determined that all three pressure transmitters would not have automatically opened the isolation valves at the required setpoint. However, other safety-related sources to the TDAFW pump were available (NRC Inspection Report 50-369/91-19).

Other licensees have also found errors in the calibration of pressure transmitters that occurred because the effects of static pressure had not been considered or had been considered inappropriately. In January 1990, the licensee for Arkansas Nuclear One (ANO), Unit 2, identified an error with calibration of water level transmitters for the steam generators (SGs). A compensation factor for static pressure effects had not been correctly included in the calibration procedure. This error resulted in an inaccurate SG water level measurement. The ANO licensee determined that, with an indicated level of 23.25 percent, the actual SG water level could be 21.8 percent, which is less than the allowable technical specification (TS) value for a low SG water level trip (LER 50-368/90-02). At the Dresden Nuclear Power Station in October of 1987, the licensee found that feedwater flow transmitters had not been calibrated to account for static pressure effects. Feedwater flow is used in determining core thermal power, and this error resulted in the unit operating above the facility's core thermal power limit (LER 50-237/87-34). In September 1986, the licensee for the Davis-Besse Nuclear Power Station determined that the startup steam generator level transmitters incorrectly compensated for the effects of the static pressure span of the instruments. This resulted in transmitter outputs indicating that steam generator level was approximately 7 inches higher than the actual level (LER 50-346/86-39).

Discussion

The errors in the calibration of pressure transmitters discussed above are related in that the effects of static pressure were improperly considered. Many were the result of an improper review of pertinent information supplied by the vendor or manufacturer when developing calibration procedures. Others were a result of inadequate technical review when revising procedures. Fundamental errors in developing calibration procedures could result in a common mode problem that could affect various pieces of safety-related equipment.

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

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

Technical contact: Scott Sparks, RII
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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
91-74	Changes in Pressurizer Safety Valve Setpoints Before Installation	11/25/91	All holders of OLs or CPs for nuclear power reactors.
91-73	Loss of Shutdown Cooling During Disassembly of High Pressure Safety Injection System Check Valve	11/21/91	All holders of OLs or CPs for nuclear power reactors.
91-72	Issuance of a Revision to the EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents	11/19/91	All holders of OLs or CPs for nuclear power reactors.
91-71	Training and Supervision of Individuals Supervised by an Authorized User	11/12/91	All NRC medical licensees.
91-70	Improper Installation of Instrumentation Modules	11/4/91	All holders of OLs or CPs for nuclear power reactors.
91-69	Errors in Main Steam Line Break Analyses for Determining Containment Parameters	11/1/91	All holders of OLs or CPs for pressurized-water reactors.
91-68	Careful Planning Significantly Reduces the Potential Adverse Impacts of Loss of Offsite Power Events During Shutdown	10/28/91	All holders of OLs or CPs for nuclear power reactors.
90-51, Supp. 1	Failures of Voltage-Dropping Resistors in the Power Supply Circuitry of Electric Governor Systems	10/24/91	All holders of OLs or CPs for nuclear power reactors.

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