

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

March 7, 2002

NRC INFORMATION NOTICE 2002-10: NONCONSERVATIVE WATER LEVEL
SETPOINTS ON STEAM GENERATORS

Addressees

All holders of operating licenses for nuclear power reactors, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to the potential for nonconservative setpoints for steam generator water level. The NRC anticipates that recipients will review this information for applicability to their facilities and consider taking appropriate actions. However, the suggestions contained in this information notice do not constitute NRC requirements and, therefore, no specific action or written response is required.

Description of Circumstances

Diablo Canyon Power Plant reported that the narrow-range steam generator water level instrumentation did not respond as expected to initiate an automatic reactor trip and emergency feedwater actuation on low-low water level in the steam generator during a plant trip of Unit 2 on February 9, 2002.

The low-low setpoint (7.2 percent) for the narrow-range steam generator water level provides a signal to automatically trip the reactor and actuate the emergency feedwater system. On February 9, 2002, the main feedwater regulating valve failed closed, resulting in a rapid decrease in the steam generator water level. Operators manually tripped the reactor as the level decreased to approximately 7.5 percent on the narrow-range, with the wide-range indicating approximately 16 percent. This manual trip of the reactor by the operators occurred within approximately 1 minute after the main feedwater regulating valve closed. Following the manual trip, the steam generator wide-range water level indication continued to decrease to a low of 10 percent when the steam generator water level began to stabilize. The level then trended upward as emergency feedwater began to refill the steam generator. On the basis of the post-trip review and conversations with Westinghouse, the manufacturer of the steam generator, Pacific Gas and Electric concluded that the steam generator water level actually fell below the 7.2 percent low-low steam generator water level setpoint before the operator manually tripped the reactor. In response, the operators declared all narrow-range steam generator water level low-low channels inoperable and entered Plant Technical Specification

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Action 3.0.3. Under that action, the operators reduced the power level of both Units 1 and Unit 2 to approximately 60 percent, where Westinghouse had indicated that the condition would no longer result in a non-conservative setpoint.

This event provides insight into setpoint errors in the steam generator water level which could delay the expected automatic reactor trip and emergency feedwater actuation. The licensee reported that Westinghouse attributes this water level discrepancy to previously unaccounted for differential pressure created by steam flow past the mid-deck plate in the moisture separator section of the steam generator. Westinghouse further indicated that this differential pressure phenomenon will cause the steam generator narrow-range to read higher than the actual water level at steam flows when the reactor is operating at a power level greater than 60 percent for Diablo Canyon. Thus, all steam generator water level instrumentation associated with this reference leg could be nonconservative during certain transients because of this differential pressure phenomenon. Diablo Canyon has since recalibrated the low-low water level setpoints for the steam generator with the additional margin to account for this newly identified error. The licensee completed this instrument recalibration before increasing the plant's power level above 60 percent.

This information notice does not require any 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 project manager from the NRC's Office of Nuclear Reactor Regulation.

/RA/

William D. Beckner, Program Director
Operating Reactor Improvements Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

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LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

| Information Notice No. | Subject | Date of Issuance | Issued to |
|------------------------|--|------------------|---|
| 2002-09 | Potential for Top Nozzle Separation and Dropping of Certain Type of Westinghouse Fuel Assembly | 02/13/2002 | All holders of operating licenses for nuclear power reactors, and non-power reactors and holders of licenses for permanently shutdown facilities with fuel onsite. |
| 2002-08 | Pump Shaft Damage Due to Excessive Hardness of Shaft Sleeve | 01/30/2002 | All holders of operating licenses for nuclear power reactors, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor. |
| 2002-07 | Use of Sodium Hypochlorite for Cleaning Diesel Fuel Oil Supply Tanks | 01/28/2002 | All holders of operating licenses for nuclear power except those who have ceased operations and have certified that fuel has been permanently removed from the reactor vessel. |
| 2002-06 | Design Vulnerability in BWR Reactor Vessel Level Instrumentation Backfill Modification | 01/18/2002 | All holders of operating licenses or construction permits for boiling water reactors (BWRs). |
| 2002-05 | Foreign Material in Standby Liquid Control Storage Tanks | 01/17/2002 | All holders of licenses for nuclear power reactors. |
| 2002-04 | Wire Degradation at Breaker Cubicle Door Hinges | 01/10/2002 | All holders of operating licenses for nuclear power reactors. |
| 2002-03 | Highly Radioactive Particle Control Problems During Spent Fuel Pool Cleanout | 01/10/2002 | All holders of operating licenses for nuclear power reactors, holders of licenses for permanently shutdown facilities with fuel onsite, and holders of licenses for non-power reactors. |