

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

April 5, 1989

INFORMATION NOTICE NO. 89-38: ATMOSPHERIC DUMP VALVE FAILURES AT
PALO VERDE UNITS 1, 2, AND 3

Addressees:

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

Purpose:

This information notice is being provided to alert addressees to potential failures of main steamline atmospheric dump valves (ADVs). 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 do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

On March 3, 1989, Palo Verde Unit 3 experienced a large load rejection and a subsequent automatic reactor power decrease from 98 percent to 45 percent power. The turbine bypass valves opened but the bypass valve controller malfunctioned, causing excessive steam relief and overcooling of the reactor coolant system (RCS). A main steamline isolation and reactor trip were caused by low pressure in the number 2 steam generator. Safety injection and containment isolation activated upon low RCS pressure. Following steamline isolation, the ADVs remained closed after operators attempted to open them first from the control room and then from the remote shutdown panel. The valves do not receive an automatic signal to open. After the ADVs failed to open remotely, auxiliary operators experienced difficulty in opening the ADVs using the handwheels because of the lack of lighting (including emergency lighting), poor labeling of ADV equipment, poor procedures and training, a disengaged handwheel, and considerable noise caused by the opening of the main steamline safety relief valves. The operators partially opened two ADVs.

The pneumatic operators on the ADVs are actuated by using either plant instrument air or a stored, pressurized nitrogen supply. The valves were manufactured by Control Components, Inc. (CCI). CCI indicated that previous problems had been experienced in the testing of ADVs at Palo Verde Unit 1 and other facilities. Excessive bonnet pressure caused by abnormally high leakage past the main valve plug piston ring is suspected to have contributed to these problems. Foreign particles from the steamlines in the clearance areas and under the piston ring sealing surfaces may produce the high piston ring leakage. CCI has developed design modifications to address this problem.

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Following the failures of the ADVs to open remotely at Palo Verde Unit 3, the licensee tested the ADVs at the other two Palo Verde units. Four of the eight valves failed the functional tests. Preliminary results indicated that there were problems with valve positioners, possible valve stem binding problems, and calibration problems with nitrogen pressure regulators. The licensee for Palo Verde is continuing to investigate the cause of valve failures but has not yet identified a root cause.

Contributing to the simultaneous ADV failures at Palo Verde is the lack of in-service testing under hot steam conditions. The valves are routinely tested during refueling outages with the steamlines cold and depressurized. For testing, the pneumatic operators are actuated with plant air rather than with the pressurized nitrogen supply.

Licensees may wish to reassess the frequency of ADV testing and to evaluate their ADV surveillance test procedures and consider performing the tests under conditions that better simulate inservice conditions.

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



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

Technical Contacts: Horace Shaw, NRR
(301) 492-0906

Walton Jensen, NRR
(301) 492-1190

Attachment: List of Recently Issued NRC Information Notices

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*D:DEST LShao 3/29/89	*C:EAB:NRR WDLanning 3/29/89	*C:OGCB:NRR CHBerlinger 3/29/89	D:DOEA:NRR CRossi 3/30/89		

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Concur w/ comment as noted. ASHOK

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LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
89-37	Proposed Amendments to 40 CFR Part 61, Air Emission Standards for Radionuclides	4/4/89	All U.S. NRC licensees.
89-36	Excessive Temperatures in Emergency Core Cooling System Piping Located Outside Containment	4/4/89	All holders of OLs or CPs for nuclear power reactors.
88-86, Supp. 1	Operating with Multiple Grounds in Direct Current Distribution Systems	3/31/89	All holders of OLs or CPs for nuclear power reactors.
89-35	Loss and Theft of Un-secured Licensed Material	3/30/89	All U.S. NRC byproduct, source and special nuclear material licensees.
89-34	Disposal of Americium Well-Logging Sources	3/30/89	All holders of an NRC specific license authorizing well-logging activities.
89-33	Potential Failure of Westinghouse Steam Generator Tube Mechanical Plugs	3/23/89	All holders of OLs or CPs for PWRs.
89-32	Surveillance Testing of Low-Temperature Overpressure-Protection Systems	3/23/89	All holders of OLs or CPs for PWRs.
89-31	Swelling and Cracking of Hafnium Control Rods	3/22/89	All holders of OLs or CPs for PWRs with Hafnium control rods.
89-30	High Temperature Environments at Nuclear Power Plants	3/15/89	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit