

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

December 29, 1978

IE Circular No. 78-19

MANUAL OVERRIDE (BYPASS) OF SAFETY SYSTEM ACTUATION SIGNALS

Description of Circumstances:

A review of several recent events has raised questions about safety system circuit designs which incorporate manual override (bypass) features. The two events described below directly relate to the practice of containment purging during normal plant operation by manually overriding containment isolation signals. In these instances the automatic isolation function of the purge system containment isolation valves was unintentionally made inoperable, and this condition was neither continuously indicated in the control room nor known to the plant operators.

During a review of operating procedures on July 25, 1978, the Northeast Nuclear Energy Company discovered that since May 1, 1978, intermittent containment purge operations had been conducted at Millstone Unit No. 2 with the safety actuation isolation signals to both inlet and outlet redundant containment isolation valves (48 inch butterfly valves) in the purge inlet and outlet penetrations manually overridden and inoperable. The isolation signals which are required to automatically close the purge valves for containment integrity were manually overridden to allow purging of containment with a high radiation signal present. The manual override circuitry designed by the plant's architect/engineer defeated not only the high radiation signal but also all other isolation signals to these valves. To manually override a safety actuation signal, the operator cycles the valve control switch to the closed position and then to the open position. This action energized a relay which blocked the safety signal and allowed manual operation independent of any safety actuation signal. This circuitry was designed to permit reopening these valves after an accident to allow manual operation of certain safety equipment.

On September 6, 1978, the Public Service Electric and Gas Company advised the staff that, as a matter of routine, Salem Unit No. 1 has been venting the containment through the containment ventilation system valves to reduce pressure. In certain instances this venting has occurred with the containment high particulate radiation monitor isolation signal to the purge and pressure-vacuum relief valves overridden. Override of

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the containment isolation signal was accomplished by resetting the train A and B reset buttons. Under these circumstances, six valves in the containment vent and purge systems could be opened with a high particulate isolation signal present. This override was performed after verifying that the actual containment particulate levels were acceptable for venting. The licensee, after further investigation of this practice, determined that the reset of the particulate alarm also bypasses the containment isolation signal to the purge valves and that the purge valves would not have automatically closed in the event of an emergency core cooling system (ECCS) safety injection signal.

These events and information gained from recent licensing actions have raised a generic concern relative to potential design deficiencies that could permit manually defeating a protection function. Since all plants with construction permits must meet the requirements of IEEE 279, we recommend that you review the design of all safety actuation signal circuits which incorporate a manual override feature to ensure that overriding of one safety actuation signal does not also cause the bypass of any other safety actuation signal, that sufficient physical features are provided to facilitate adequate administrative controls, and that the use of each such manual override is annunciated at the system level for every system impacted.

Compliance with Federal Regulation 50.55a(h) requirements will be verified by NRC through the licensing review process and during regular onsite inspections for plants with construction permits. NRC's requirements relative to this matter have been conveyed to all operating plant licensee's via a generic letter.

No written response to this Circular is required. If you require additional information regarding this matter, contact the Director of the appropriate NRC Regional Office.

LISTING OF IE CIRCULARS ISSUED IN 1978

Circular No.	Subject	Date of Issue	Issued To
78-01	Loss of Well Logging Source	4/5/78	All Holders of Well Logging Source Licenses
78-02	Proper Lubricating Oil for Terry Turbines	4/20/78	All Holders of Reactor OLs or CPs
78-03	Packaging Greater Than Type A Quantities of Low Specific Activity Radioactive Material for Transport	5/12/78	All Holders of Reactor OLs, CPs, Fuel Cycle, Priority I Material and Waste Disposal Licenses
78-04	Installation Error That Could Prevent Closing of Fire Doors	5/15/78	All Holders of Reactor OLs or CPs
78-05	Inadvertent Safety Injection During Cooldown	5/23/78	All Holders of Reactor OLs or CPs
78-06	Potential Common Mode Flooding of ECCS Equipment Rooms at BWR Facilities	5/23/78	All Holders of Reactor OLs or CPs
78-07	Damaged Components of a Bergen-Paterson Series 25000 Hydraulic Test Stand	5/31/78	All Holders of Reactor OLs or CPs
78-08	Environmental Qualification of Safety Related Equipment at Nuclear Power Plants	5/31/78	All Holders of Reactor OLs or CPs
78-09	Arcing of General Electric Company Size 2 Contactors	6/5/78	All Holders of CPs

LISTING OF IE CIRCULARS ISSUED IN 1978

Circular No.	Subject	Date of Issue	Issued to
78-10	Control of Sealed Sources Used in Radiation Therapy	6/14/78	All Medical Licensees in Categories G and G1
78-11	Recirculation M-G Set Overspeed Stops	6/15/78	All Holders of BWR OLS or CPs
78-12	HPCI Turbine Control Valve Lift Rod Bending	6/30/78	All Holders of BWR OLS or CPs for plants with HPCI Terry Turbine
78-13	Inoperability of Multiple Service Water Pumps	7/10/78	All Holders of Reactor OLS and CPs except for plants located in: AL, AK, CA, FL, GA, LA, MS, SC
78-14	HPCI Turbine Reversing Chamber Hold Down Bolting	7/12/78	All Holders of BWR OLS or CPs for plants with a HPCI Terry Turbine excepting Duane Arnold and Monticello
78-15	Checkvalves Fail to Close In Vertical Position	7/20/78	All Holders of Reactor OLS or CPs
78-16	Limitorque Valve Actuators	7/26/78	All Holders of Reactor OLS or CPs
78-17	Inadequate Guard Training/Qualification and Falsified Training Records	10/13/78	All Holders of and applicants for Reactor OLS.
78-18	UL Fire Test	11/6/78	All Holders of Reactor OLS or CPs