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## DEGRADATION OF BWR SCRAM DISCHARGE VOLUME CAPABILITY

During our review of BWR operating experience, two events have raised concern on operations related to the control rod drive system scram discharge volume (SDV).

### Description of Circumstances:

At Hatch Unit 1, on June 13, 1979, while performing surveillance to functionally test SDV high level switches, two switches (C11-N013A, B) were found to be inoperable. Redundant switches (C11-N013 C, D) were operable. The reactor was in the refuel mode and these switches had been modified prior to this occurrence. Inspection of the inoperable level switches revealed that the float rod was bent and binding against the side of the float chamber on both switches. The licensee believes that the float rods were bent during or prior to initial installation and that metal particles from the modification caused binding of the float. (LER 79-038)

Brunswick Unit 1 reported that slow closure of the SDV drain valve during a reactor scram on October 19, 1979 apparently caused a water hammer event which damaged several pipe supports on the SDV drain line. Drain valve closure time was approximately five minutes due to a faulty solenoid controlling air supply to the valve. The damaged pipe supports were repaired but repair parts for the faulty solenoid were not available. To prevent possible damage from a scram, the unit started up with the SDV vent and drain valves closed except for periodic draining. During this mode of operation the reactor scrambled from high level in the SDV, without prior actuation of either the high level alarm or rod block switch. Subsequent inspection revealed that the float ball on the rod block switch was crushed and the float ball stem on the high level alarm switch was bent such that the switches would not operate. The water hammer event discussed above was the reported cause of failure of these two switch assemblies. (LER 79-74)

As a result of these events and related anticipated transients without scram (ATWS) studies, concern arises that the SDV function may be degraded by the undetected presence of fluid in the SDV. The second event is significant in that it indicates the potential for a common cause failure (faulty solenoid) to result in operation of the SDV in a manner which could defeat both the level switch function and the SDV draining function. The ATWS generic studies (NUREG 0460) have led the staff to propose, among other requirements, improvements in the SDV designs to reduce susceptibility to common cause failures. By separate correspondence, the staff will provide example Technical Specifications related to the action items discussed below.

**A. GE BWR's With an Operating License**

The following actions are to be taken by licensees of GE designed BWR facilities with an operating license:

1. Review plant records for instances of degradation of any SDV level switch which was or may have been caused by a damaged or bent float assembly. Identify the cause and corrective action for each instance.
2. Review plant records for instances of degradation of SDV vent and drain valve operability. Provide the closure times required and typically observed for these valves and the basis for the required closing times. Identify the cause and corrective action for each instance of degradation.
3. By procedures, require that the SDV vent and drain valves be normally operable, open and periodically tested. If these valves are not operable or are closed for more than 1 hour in any 24 hour period during operation, the reason shall be logged and the NRC notified within 24 hours (Prompt Notification).
4. Review instances in which water hammer or damage which may have been caused by water hammer has occurred in SDV related piping. Identify the cause and corrective action for each instance.
5. Review surveillance procedures to ensure that degradation of any SDV level switch due to a damaged float or other cause would be detected and that inoperability from any cause would be reported to the NRC.
6. If no functional test or inspection which would detect degradation of each SDV level switch has been performed during the past 3 months, make provisions to perform an inspection and functional test of all SDV level switch assemblies at the next reactor shutdown of greater than 48 hours duration.

**B. Reporting Requirements**

The action taken in response to the items in Part A shall be completed and a written report on the results submitted to the NRC within 45 days from the date of this Bulletin.

This report should be submitted to the Director of the appropriate NRC Regional Office and a copy should be forwarded to the NRC Office of Inspection and Enforcement, Division of Reactor Operations Inspection, Washington, D.C. 20555.

Approved by GAO, B180225 (R0072); clearance expires 7-31-80. Approval was given under a blanket clearance specifically for identified generic problems.

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80-12	Decay Heat Removal System Operability	5/9/80	Each PWR with an OL
80-11	Masonry Wall Design	5/8/80	All power reactor facilities with an OL, except Trojan
80-10	Contamination of Nonradioactive System and Resulting Potential for Unmonitored, Uncontrolled Release to Environment	5/6/80	All power reactor facilities with an OL or CP
80-09	Hydramotor Actuator Deficiencies	4/17/80	All power reactor operating facilities and holders of power reactor construction permits
80-08	Examination of Containment Liner Penetration Welds	4/7/80	All power reactors with a CP and/or OL no later than April 7, 1980
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80-06	Engineered Safety Feature (ESF) Reset Controls	3/13/80	All power reactor facilities with an OL
80-05	Vacuum Condition Resulting In Damage To Chemical Volume Control System (CVCS) Holdup Tanks	3/10/80	All PWR power reactor facilities holding OLs and to those with a CP
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80-04	Analysis of a PWR Main Steam Line Break With Continued Feedwater Addition	2/8/80	All PWR reactor facilities holding OLs and to those nearing licensing