

DIAPHRAGM FAILURES IN AIR OPERATED AUXILIARY ACTUATORS FOR
SAFETY/RELIEF VALVES

DESCRIPTION OF CIRCUMSTANCES:

On July 8, 1976, Vermont Yankee reported that during a scheduled refueling outage surveillance test on their Target Rock valves, the auxiliary air actuator was found to be inoperable on three of the four valves.

The licensee reported that investigation disclosed that the actuator diaphragms, composed of dacron fabric reinforced silicone rubber, had been degraded by excessive heat. The excessive heat is attributed to the fact that, contrary to the valve manufacturer's installation instructions, thermal insulation had been applied to the pneumatic actuator. The licensee further reported that the valve in which the diaphragm was found not to be degraded, was installed in the direct path of cooling air discharge from the ventilation system, thus receiving supplementary cooling.

Elastomeric materials such as the subject diaphragms are known to have finite service life and to be degraded by excessive temperatures; however, this is the first reported instance of degradation of this component. This event has particular safety significance, since failure of the diaphragms defeats the function of the Automatic Depressurization System. In recognition of this situation, the NRR Division of Operating Reactors conducted a telephone survey on July 16, 1976, of selected BWR operating facilities.

ACTION TO BE TAKEN BY LICENSEE:

All operators of BWR and PWR reactor facilities with operating licenses are to take the following action:

1. Determine that the insulation installed on safety related diaphragm operated relief valves in high temperature fluid systems is in accordance with the current recommendations of the valve vendor i.e., that there is no thermal insulation on the air actuator.
2. Ensure that the procedures used for the disassembly and inspection of these valves, as required by the Technical Specifications, specifically include inspection of the subject diaphragms to determine that no significant deterioration of the diaphragm material has occurred.
3. Ensure that the vendor's recommended service life and shelf life for the diaphragms is not exceeded for the environmental conditions to which the material is exposed.
4. A report of your plans and schedules for accomplishing the above actions should be submitted within 10 days after receipt of this Bulletin. For facilities already surveyed by NRR:DOR, this report should confirm information reported orally.
5. The NRC Regional Office should be promptly informed, within 24 hours, of any adverse findings resulting from your inspection and/or review of the subject diaphragms or their application.
6. Within 20 days after completion of the actions described in Item 4 above, report the results, including for any valves found to have degradation of diaphragms, the make, type, size, diaphragm material, and service (system) application.

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

Approval of NRC requirements for reports concerning possible generic problems has been obtained under 44 U.S.C 3152 from the U. S. General Accounting Office.

(GAO Approval B-180255(R0072), expires 7/31/77).