

ENCLOSURE 3

Safety Evaluation Report Valve Operability Donald C. Cook Nuclear Plant, Unit No. 2 Docket No. 50-316

By letter January 13, 1977, Indiana and Michigan Electric Company described the results of a test performed to demonstrate the operability of the containment isolation valves in the D. C. Cook Nuclear Plant, Unit 2 containment purge and pressure relief systems. By letter dated February 3, 1978, Indiana and Michigan Electric Company provided additional information regarding the post-test inspection of the test valve and the location of the containment isolation valves for the purge and containment pressure relief systems.!

Indiana and Michigan Electric Company had performed a test to demonstrate the operability (i.e., ability to close under accident flow and pressure conditions) of the containment purge system isolation valves. This test was performed to support the then proposed change to the Technical Specifications. We found that the test, which was performed on a 30-inch diameter uppper compartment purge system isolation valve, at a containment pressure of about 8.75 psig, was sufficient to demonstrate the operability of the isolation valves in the containment upper compartment purge and vent lines, but that the test pressure was not representative of that predicted to occur under accident conditions in the containment lower compartment. We, therefore, concluded that Technical Specification 3/4.6.1.7 should be modified to permit the use of the lower compartment and instrument room purge systems only during the operating modes of cold shutdown and refueling.



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Subsequently Indiana and Michigan Electric Company submitted further information (April 27, August 11, and September 11, 1978) to demonstrate the operability of the lower compartment and instrument room purge system containment isolation valves on the basis of the test already performed. We have reviewed this information and conclude that they had provided acceptable analyses which demonstrate the operability of these containment isolation valves.

The licensee has installed redesigned debris screens in the lower compartment and instrument room purge system piping immediately inboard of the inner containment isolation valves in the inlet and exhaust lines of these systems. The new debris screens were sized to give pressure conditions at the containment isolation valves the same as that which existed for the tested valve.

The licensee performed analyses of the test performed with the 30-inch upper compartment valve to determine the torque generated on the valve shaft during the opening and closing cycles. The opening torque is greater than the closing torque since, in opening, the valve operator must overcome the seat and bearing friction as well as the dynamic flow torque.

Closing torques were then calculated for the lower compartment and instrument room purge system isolation valves, assuming pressures of 15 psig at the lower compartment purge system supply inlet and 11 psig at the lower compartment purge system exhaust inlet and the instrument room purge system supply and exhaust inlets. Sensitivity studies were

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performed to determine the effects of uncertainties in the flow loss coefficients for the debris screens and system piping on the calculated torques. In all cases the calculated closing torques for the instrument room and lower compartment purge system isolation valves were less than the calculated opening torque for the tested valve, and were significantly less than the valve operator rated torque of 10,300 in-lb for the valves.

We find that the upper compartment purge valve test coupled with the analyses performed by the licensee constitute an acceptable demonstration of the ability of the lower compartment and instrument room purge systems' containment isolation valves to close in the event of a loss-of-coolant-accident. Accordingly, we conclude that the licensee has demonstrated operability on the containment isolation valves in the D. C. Cook purge and vent system.

By letter dated January 4, 1979 Indiana and Michigan Electric Company stated that the information provided for Unit No. 2 Containment Purge and Vent System applies to Unit No. 1 Containment Purge and Vent System. The similarity of Unit Nos. 1 and 2 Containment Purge and Vent Systems was verified by the NRC inspection of the D. C. Cook Nuclear Plant. Therefore our concludsion with regard to operability of the containment isolation valves in Unit No. 2 applies to the operability of containment isolation valves in Unit No. 1. .

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