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MALFUNCTION OF TARGET ROCK SAFETY RELIEF VALVES

We have reviewed information from the Tennessee Valley Authority describing the malfunction of a Target Rock (TR) safety relief valve at Browns Ferry Unit 1. As a result of this malfunction, the second stage piston of the valve was prevented for reseating after actuation, resulting in the primary system being blown down to 20 psig before the spring on the assembly could reseat the piston.

In addition, we have reviewed with the responsible parties at General Electric Corporation in San Jose, their operating and testing experiences with the Target Rock Safety/Relief Valve, which prompted them to require the modification described in their FDI No. 138/78003 (Pilgrim identification) dated February 28, 1974, for the safe operation of BWR facilities. The failure of valves at their testing facility, in addition to those described below, suggests a generic weakness in the design of the second stage operator of the valve.

General Electric and Target Rock are studying ways of modifying the second stage piston to permit maintenance as required without total replacement of the piston and disc, and to eliminate the present problem involving displacement of the locking device.

A. Description of Circumstances

The reactor was isolated and in a shutdown condition following closure of the mainsteam line isolation valves as a result of high temperature in the main steam tunnel. During relief valve operation to reduce reactor pressure, one of the pressure relief valves on the main steam header failed to reseat until pressure had been reduced to about 20 psig. The valve was subsequently removed and disassembled for inspection. It was found that the keeper over the locking nut on the second stage piston had worked loose and up to the stem over the securing wire. The movement of the keeper prevented the second stage piston from reseating.

As a corrective measure, all the TR valves on Unit 1 were replaced with valves from Unit 2 after the following modifications had been performed:

1. The tie wire and keeper were removed from the stem of the second stage piston.
2. A 1/16 inch diameter hole was drilled through the nut and the threaded portion of the stem.

3. A pin was inserted in the hole and the hole peened over so that the pin could not come out.

This modification has been recommended by the Nuclear Steam System Supplier to all BWR's using the Target Rock valves.

B. Action Requested

1. It is requested that you complete at the next cold shutdown the necessary modifications to the second stage piston stem locking nut to prevent the malfunction described.
2. It is requested that you ascertain what other modifications to the original design have been made or recommended for the Target Rock valves now installed in your facility.
3. Please inform this office within 20 days of your receipt of this Bulletin:
 - a. Of your plans to complete the modifications to second stage piston stem locking nut; and
 - b. Of the action you have taken or will take to complete other modifications recommended for the Target Rock valves now installed in your facility.
4. In the event the permanent modification is ready at the time of your next cold shutdown, it should be installed rather than making the temporary fix.