Regulatory File Cy. 50-237

Commonwealth Edison Company

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Dresden Nuclear Power Station
R. R. #1
Morris, Illinois 60450
May 18, 1972

Dr. Peter A. Morris, Director
Division of Reactor Licensing
U.S. Atomic Energy Commission
Washington, D.C. 20545

Subject: License DPR-19, Dresden Nuclear Power Station, Unit #2,
Section 6.6C.1 of the Technical Specifications

Dear Dr. Morris:

This is to report a condition relating to the operation of the station, in which, during primary containment local leak rate tests conducted as required by Section 4.7.A.2.e of the Technical Specifications, five areas of leakage, in excess of limits, were identified.

PROBLEM, INVESTIGATION AND CORRECTIVE ACTION

Local leak rate tests of primary containment penetrations and isolation valves were conducted, as required by Section 4.7.A.2.e of the Technical Specifications during the period from February 28 to May 9, 1972. At the time, the unit was shutdown and in the midst of a refueling outage.

The procedure to perform a local leak rate test consists of pressurizing the volume bounded by the valves or seals being tested to 48 psig. The decay of this pressure is then observed over a period of time to determine the leakage rate according to the formula;

$$\text{Leakage (scfh)} = \frac{V}{T}\,\frac{(Pi - Pf)}{(Ri - Rf)}\,35.38$$

where

V = penetration volume (ft^3)
T = time (hrs)
Pi = initial pressure (psia)
Pf = final pressure (psia)
Ri = initial temperature (degrees Rankin)
Rf = final temperature (degrees Rankin)
35.38 = constant necessary to convert to scfh.

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As a result of these tests, the primary containment personnel air lock, two feedwater check valves, and four air operated butterfly valves in the pressure suppression system were found to have leakage rates in excess of Technical Specifications Limits.

a. Primary Containment Personnel Air Lock

Initial testing of the personnel air lock indicated a leakage rate from the lock of approximately 134 standard cubic feet per hour (scfh) which is approximately 450% of the allowable leakage for a single penetration. The source of essentially all of this leakage was determined to be through the exterior upper handwheel stem seal. It is believed that this leakage resulted from the large amount of use during the refueling outage, prior to conducting the test.

New packing was installed and a new packing gland for the stuffing box was fabricated. After repairs the lock was retested satisfactorily, exhibiting no measureable leakage.

Because the leakage was through only the exterior barrier of the personnel lock, primary containment leakage to the environment would have been zero in the case of an accident. (The interior barrier was essentially leak tight).

b. Pressure Suppression System Air Operated Butterfly Valves

1. Torus/Reactor Building Vacuum Breaker Isolation Valve (1601-20B)

Initial testing of the piping between the torus/reactor building vacuum breaker valves AO-1601-20B and 1601-31B indicated a leakage of approximately 17,000 scfh. Investigation indicated that the leakage was through AO-2-1601-20B. This valve was removed from the line and it was noted that the rubber seat was badly worn and cracked. The seat was made of Buna-N rubber, rated for operation at temperatures up to approximately 190°. The valve was sent to the manufacturer for installation of a new rubber seat made of a rubber compound, "EPT", rated at 250°F steady state and 300°F for a short duration of time (10 hrs). The valve was reinstalled and another leak rate test performed. The leakage on this test was 8.071 scfh or 27.5% of the permissible limit for a primary containment isolation valve.

Because valve 1601-31B, a check valve in series with the rubber seated air operated valve AO-1601-20B, was essentially leaktight, little or no leakage from the primary containment in the case of an accident would have occurred via this penetration.

2. Drywell Purge Valve (1601-21), Drywell and Torus Vent from Reactor Building Valve (1601-22), and Torus Purge Valve (1601-56)

On December 8, 1971, while searching for areas of potential leakage from the primary containment, a check of the valves in the primary containment purge lines indicated that valves AO-1601-21 and AO-1601-22 were leaking excessively. At that time, a blind flange was installed

on the purge inlet line to maintain primary containment integrity. AO-1601-21 and AO-1601-22 and AO-1601-56 were removed from the system during the refueling outage for previously planned repairs. Valve AO-1601-56 was replaced with a spare. The seats of these valves were found badly cracked. Valve AO-1601-21 and AO-1601-22 were sent to the factory for installation of new rubber seats made of "EPT". The opinion of the vendor was that the initial installation of the Buna-N type rubber seats on these valves was not done properly. The repaired valves were returned to the site, installed and leak tested. The final leak rate for valves AO-1601-21, AO-1601-22 and AO-1601-56 was 14.890 scfh or 50.7% of the limit for an individual isolation valve.

All other rubber seated valves in the pressure suppression system were tested and were within Technical Specification Limits.

A review of all rubber seated valves utilized for primary containment is in progress to determine adequacy of the material used. If necessary these valves will be repaired or replaced.

As an interim measure, testing frequency will be increased by a factor of approximately 6, from once per refueling outage to once every three months.

c. Feedwater Check Valves

The initial testing performed on feedwater check valve 220-58B indicated excessive leakage. The check valve was disassembled to clean and lap the valve seating ring and seat. The valve was reassembled, a 1000 psi hydrostatic test performed to insure seating, and an air leak rate test conducted. The result of this test was 6.864 scfh or 23.4% of the limit for a primary containment isolation valve.

The initial testing performed on feedwater check 220-62B indicated excessive leakage. The internals of the valve had to be remachined by a commercial machine shop under the direction of the valve manufacturer's representative. The clearance between the seat bushing and disc pin was reduced from approximately .014" to .002". The seating surfaces were also completely remachined. Following repairs the valve was reassembled, installed and the leakage rate check was performed with results of 3.680 scfh or 12.5% of the limit for a primary containment isolation valve.

It should be pointed out that the primary function of these feedwater check valves is to close and seal under high differential pressure, hydrostatic conditions. Unless a double pipe rupture occurs these valves

would have a water seal which would essentially eliminate leakage via this path.

Sincerely,

Fred S. Morris
for W. P. Worden

WPW:GJD:sds

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