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Dresden Nuclear Power Station
R. R. #1
Morris, Illinois 60450
February 12, 1971

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

SUBJECT: LICENSE DPR -25, DRESDEN NUCLEAR POWER STATION UNIT 3, SECTION 6.6.B.3 of THE TECHNICAL SPECIFICATION.

Dear Mr. Morris:

This is to report a condition relating to the operation of the station in which the total amount of radioactivity in liquid storage in the above ground tanks (Waste Sample Tanks, Floor Drain Sample Tanks and the Waste Surge Tank) exceeded 3.0 curies and the radioactivity in the "A" Waste Sample Tank ("A" WST) and Waste Surge Tank exceeded 0.7 curies for a period of greater than 24 hours before recycling to reduce the radioactivity in these tanks as required by Section 3.8.B. of the Technical Specification.

Problem, Investigation and Corrective Action

The conditions leading to high radioactivity in the above ground tanks developed on Tuesday, February 2, 1971 when water in the waste collector system became high in conductivity as a result of off-standard equipment drainage to system. At that time the cause of off-standard equipment drainage was not known. The high conductivity water was processed to the Surge tank by-passing the waste demineralizer at 5:05 A.M. February 2; to the "A" Waste Sample Tank at 8:45 P.M. February 2, and to the "B" Waste Sample Tank at 10:57 A.M. February 3, 1971. Samples were taken on February 3 of each of these tanks (as well as all other above ground tanks) which showed high radioactivity as follows:

| | |
|---|---|
| "A" WST | $1.7 \times 10^7$ pCi/l |
| "B" WST | $6.2 \times 10^6$ pCi/l |
| Surge | $5.5 \times 10^6$ pCi/l |

An operating order which was issued November 20, 1970 required special recognition of any tank with a water activity of over $2 \times 10^6$ pCi/l. It required a review of conditions causing the high activity and corrective action as may be appropriate. (The order was rewritten February 8 in recognition of the change in DPR-19 on February 5 making it similar to DPR-25).

IS/OR/Staff 3/2/71
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The need for immediate action was recognized and a program was initiated to accomplish reduction in above-ground water activity by recirculation to below-grade tanks and recirculation through the filter and demineralizer until total activities in each above-grade tank was reduced to normal levels. A review of operations was also begun to determine the source of off-standard water.

"B" WST was drained to the waste collector at 7:02 P.M. February 3, reprocessed through the filter and demineralizer at 11:15 P.M. The activity of the sample taken at 2:50 A.M. February 4 was $2.3 \times 10^5$ pCi/l (total activity 0.02 Ci). Since this water was not acceptable for re-use in the plant it was recycled again. Since a sample at 8:20 A.M. showed it was still unacceptable for re-use in the plant it was then discharged to the river at a controlled rate.

"A" WST was drained to the waste collector at 7:16 A.M. February 5, reprocessed through the filter and demineralizer. The activity of the sample taken at 4:15 P.M. February 5 was $4.5 \times 10^9$ pCi/l (total activity .47 Ci).

The surge tank was recycled through the filter and demineralizer at 8:00 P.M. February 6 and the activity of a sample taken at 12:45 P.M. February 7 was $4.1 \times 10^6$ (total activity .36 Ci).

The individual * and total above-ground tank water activities over the period following initial conditions are as follows:

| | 2/3/71 11 A.M. | 2/4/71 8 A.M. | 2/5/71 8 A.M. | 2/6/71 2 P.M. | 2/7/71 11 A.M. | 2/8/71 8 A.M. | |
|---|---|---|---|---|---|---|---|
| A WST | 1.68 | 1.68 | 0.80 | 0.42 | 0.01 | 0.01 | Curies |
| B WST | 0.71 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | |
| C WST | 0.01 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 | |
| Surge | 1.07 | 1.07 | 1.07 | 1.07 | 0.36 | 0.01 | |
| A FDST | 0.42 | 0.33 | 0.33 | 0.15 | 0.07 | 0.16 | |
| B FDST | 0.35 | 0.23 | 0.23 | 0.19 | 0.16 | 0.05 | |
| Total | 4.24 | 3.35 | 2.43 | 1.83 | 0.61 | 0.23 | Curies |

* Individual activities may be interpolated values based on most applicable sample analyses whenever tanks are in the process of being filled or drained.

Water was reprocessed to reduce activity at the maximum rate consistent with maintaining adequate below-grade tank volumes to handle continued plant input. The plant input was held to a minimum by limiting reactor power and deferring actions such as condensate demineralizer backwashing.

The action taken to by-pass the demineralizer at the time high conductivity water was initially found in the waste collector was to provide temporary high-conductivity storage while temporarily preserving the demineralizer capability for the subsequent volume of high-activity low-conductivity water. As waste collector water conductivity improved, the tank ("B" WST) of lowest conductivity was processed first in order to demineralize the highest total volume of water before the resin bed depleted. This action resulted in a greater total reserve volume in the radwaste plant. The resins in the waste demineralizer were replaced as required until activities in above-ground tanks were normal.

The need to evaluate plant operations in terms of the effects on radwaste operation has been re-emphasized in order to detect and identify any abnormal effects on radwaste plant operations.

Investigation of the sources of high conductivity water revealed two major sources. The first source was identified as improper routing during construction of the Unit 3 shutdown heat exchanger shell drains to the equipment drain tank rather than to the floor drain sump as called for in the design. The 3A shutdown heat exchanger shell, which normally contains closed cooling water inhibited with sodium nitrite, was drained to permit heating of the unit 3 reactor water for recirculation tests. This resulted in one heat exchanger volume of the closed cooling system water to drain to the waste collector via the reactor building equipment drain tank. These lines were rerouted, as designed, to the floor drain system on February 6, 1971.

A second source of high conductivity water was due to drainage of water from the Unit 3 HPCI system to a drain which caused high conductivity water from the floor to flow to the waste collector system. This area was cleaned so that any further leakage or drainage would not contaminate the waste collector system with high conductivity water.

One source of high activity in the waste collector was found to be relief valve leakage on a Unit 2 reactor water cleanup system heat exchanger. This was repaired on February 7, 1971.

Further checks are being conducted for any other potential sources of this type of water to the waste collector system so that appropriate action can be taken if required. In addition a complete review of plant input volumes to radwaste is being planned, involving installation of instrumentation and sample lines now planned for the forthcoming refueling outage of Unit 2.

No uncontrolled or unplanned release has occurred as a result of this situation. The program was reviewed by the Station Review Board on February 5 and by Atomic Energy Commission Compliance and DRL representatives on February 8, 1971.

H. K. Hoyt
Superintendent

HKH:GLR:cwl