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TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE
37401

TVA
40TH
ANNIVERSARY
OF PEOPLE IN
PARTNERSHIP

February 22, 1974

Mr. Don Knuth
Directorate of Regulatory Operations
U.S. Atomic Energy Commission
Washington, DC 20545

Dear Mr. Knuth:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 1 - DOCKET NO. 50-259 - FACILITY OPERATING LICENSE DPR-33 - ABNORMAL OCCURRENCE REPORT BFAO-746W

The enclosed report is to provide details concerning the release of radioactive material to the unit 2 reactor building floor drain sumps, which occurred on Browns Ferry Nuclear Plant unit 1 on November 13, 1973, and is submitted in accordance with 10 CFR 20 paragraph 405(a).

This report was mistakenly submitted to the Directorate of Licensing on January 30, 1974.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

for E. F. Thomas
Director of Power Production

Enclosure

Docket 50-259

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Report No. BFAO-746W
Report Date: January 30, 1974
Occurrence Date: November 13, 1973
Facility: Browns Ferry Nuclear Plant, Unit 1

Identification of Occurrence

On November 13, 1973, it was determined that radioactive material had been released to the unit 2 reactor building floor drain sumps. At that time, it was felt that this was not a reportable abnormal occurrence as defined in the technical specifications. During the AEC regulatory inspection of January 8-11, 1974, the AEC inspectors requested we submit a report of the radioactive release as an abnormal occurrence.

Conditions Prior to Occurrence

The unit 1 reactor was operational during the startup test program. The unit 2 reactor cleanup backwash transfer pump and backwash receiver tank rooms had been previously barricaded and zoned as a restricted area for control of exposure to radiation and radioactive materials because of the presence of radiation dose rates of approximately 1-2 mRem/hr at contact on some of the units 1 and 2 backwash transfer pump tie lines on the unit 2 side. This dose rate apparently came from resins that had breached the closed, tagged, and locked interface valves between units 1 and 2. At the time the barricades were established, the line from the unit 2 backwash transfer pump suction to the unit 2 backwash receiver tank (which was disconnected from the tank) was checked and no radioactive material was present. In addition, a smear survey of the floor was made and no contamination was present.

Description of Occurrence

On November 13, the unit 2 cleanup backwash receiver tank room was surveyed as a prerequisite to entry by construction employees. A recheck of the system tie lines showed radiation dose rates up to 10 mRem/hr at contact. A survey of the line from the backwash transfer pump suction to the backwash receiver tank indicated the presence of radioactive material on the open flange of this line and on the floor under the tank. Contamination was found leading from a point under the open flange to a floor drain nearby.

Samples of the two unit 2 reactor building floor drain sumps were immediately collected, and no activity above Maximum Permissible Concentrations (MPC) was found.

At this time, both units 2 and 3 east reactor building floor drain sumps were barricaded and zoned into the restricted area.

Description of Occurrence (continued)

Samples were obtained and counted from all units 2 and 3 sumps and indicated no presence of radioactivity above MPC except the sludge in the unit 2 reactor building west floor drain sump. On November 15, this sump was pumped down to sample the bottom sludge. This sample was analyzed on the gamma spectrometer, which detected the following isotopes and concentrations:

^{51}Cr - 8.48×10^{-3} uCi/ml

^{58}Co - 6.58×10^{-3} uCi/ml

^{60}Co - 4.83×10^{-4} uCi/ml

Analyses of Occurrence

It has not been absolutely determined how the radioactive material was discharged out the pump suction to the receiver tank line. Although hold orders had been issued and placed on each applicable valve in the backwash system, apparently leaking valves during operation of the unit 1 backwash transfer pump allowed contaminated unit 1 backwash resins to escape the open line and enter the floor drain.

The only sample that exceeded MPC during the period was the sample of sludge from the unit 2 west reactor building floor drain sump. This sump was full of water, it had no pump installed, and it has an opening only 18 x 18 inches with no ladder. An individual could not have been exposed to the sludge without deliberately installing a pump, pumping the water out, placing a ladder into the sump, and climbing down into the sludge.

Corrective Action

All units 2 and 3 areas were freed of significant radioactive contamination and returned to unrestricted zone status.

The line from the unit 2 backwash receiver tank to the transfer pump was reconnected, the tank was filled with clean water, and the unit 2 backwash system was flushed to the radwaste system until no radioactive material could be detected. All lines connecting the units 1 and 2 backwash system were modified so that there were at least two closed valves between the units. A telltale valve was installed between the two valves on the unit 1 side of the dividing wall. The telltale valve will remain open so that any leak from the units 1 and 2 reactor cleanup system tie lines will drain to the radwaste system.

The unit 2 reactor building floor drain sumps are on a periodic sampling schedule so that each sump is sampled at least twice weekly.