50-237
50-249

Commonwealth Edison Company

ONE FIRST NATIONAL PLAZA ★ CHICAGO, ILLINOIS

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July 20, 1971

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

Subject: Additional Information concerning Special Report No. 15, Dresden Unit 3, DPR-25 and Special Report No. 3, Dresden Unit 2, DPR-19

Dear Dr. Morris:

In a letter dated March 22, 1971, we submitted to you Special Report No. 3 "Investigation of Failure of Radioactive Liquid Waste System." Following a review of this report, members of your staff requested an updated Process Flow Diagram of the liquid radwaste system. Enclosed is the requested diagram.

In a letter dated June 28, 1971, we submitted to you Special Report No. 15 "Jet Pump Flow Blockage of the Dresden 3 Reactor March 15, 1971." Following a review of this report by members of your staff, additional information was requested concerning the magnitude of release rates if fuel damage were to occur due to missing hardware from a purge dam. Enclosed is the supplementary information which you requested.

In addition to three signed originals, 19 copies of this information are also submitted.

/s/ JGK/Staff 7/3/71
LR
DP
RHE

Very truly yours,

Byron Lee, Jr.
Assistant to the President

SUBSCRIBED and SWORN to before me this 20th day of July, 1971.

Patricia A. Nilsen
Notary Public

50-249 request 3280

X-Docket 50-237

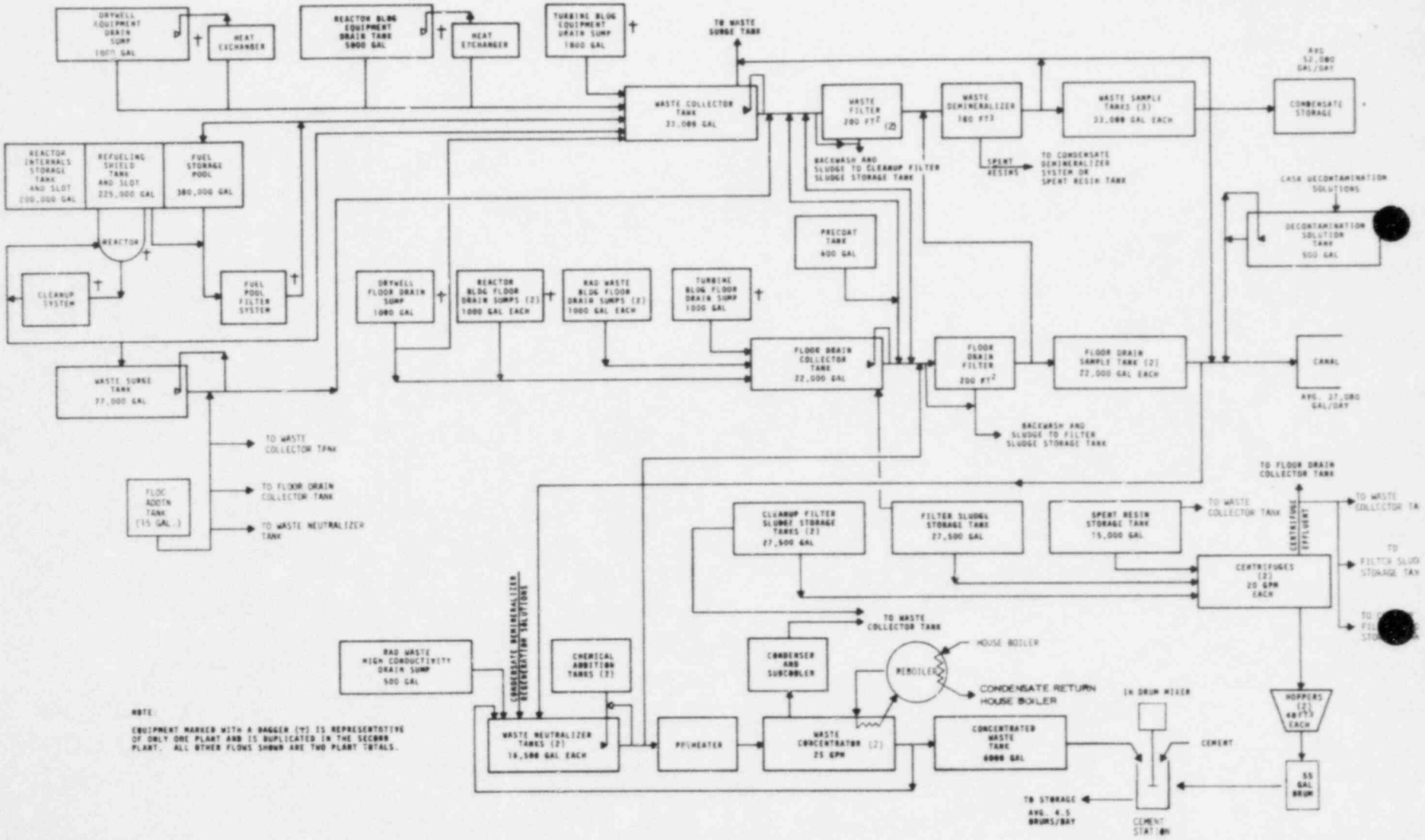

Figure 9.3.1 Process Flow Diagram -
Radioactive Waste Control System

SUPPLEMENTAL INFORMATION TO SPECIAL
REPORT #15

JET PUMP FLOW BLOCKAGE ON THE DRESDEN
3 REACTOR MARCH 15, 1971

In the Conclusion of Special Report #15 "Jet Pump Flow Blockage on the Dresden 3 Reactor March 15, 1971," it was indicated that the missing hardware posed no problem. In addition, it was indicated that if a piece of the hardware did work its way into a fuel bundle, fuel damage could occur but releases would be within operating limits. The purpose of this supplement is to provide additional information on the above Conclusion.

As was pointed out in Report #15, it is our conclusion that the missing wood and rubber will not pose any threat to the fuel since it will break down under the reactor environment. However, the missing steel hardware, namely, 3 (maybe 4) nut screw combinations ¼" X 1¼", 1 washer ¼" and 1 nut ¼", could pose a very remote potential for fuel clad damage. Since these missing pieces are not large enough to cause any serious flow restriction to a fuel bundle, the only way in which fuel damage could result is if the pieces worked themselves up into the bundle fretting the clad or impeding the normal cooling process locally. While this is a possibility, it is highly unlikely for the following reasons:

1 - If the pieces were to get into the lower plenum, it is also likely that they would get into the cleanup system and thereby pose no threat to the fuel.

2 - While it is possible for the pieces to be swept up into the core region if they entered the lower plenum, there are very few locations where the horizontal velocity would be high enough to sweep the pieces off the floor of the vessel. These locations are probably restricted to those directly in line with the recirculation line outlet, near the periphery of the guide tubes.

3 - If the pieces fell to the bottom of the vessel, they would tend to drift toward the vessel centerline where horizontal velocities are very low.

4 - The boundary layers on the vessel are probably thicker than the pieces except for near the vicinity of the recirculation line outlet. Thus, the boundary layer effect would reduce the capability of the fluid to sweep the pieces off the floor of the vessel.

5 - If the pieces passed through the orifice they would have to pass through the nose piece guards and the lower tie plate which has holes of only 3/8" diameter. Since all of the pieces are larger than the holes, the only way they could get into the bundle is by working themselves in. This would require a very unlikely alignment of the pieces with the small passages.

6 - If a piece were to make it through the lower tie plate, it would be stopped by the first spacer, which could cause local CHF and overheating, damaging the clad and 4 fuel rods or less, an insignificant number. If each of the six pieces made it up through the tie plate, the maximum number damaged rods would be only 24, still an insignificant number.

To calculate the off-gas release, the following assumptions were made:

1 - 386 curies of noble gases are available for release from the plenum.

2 - The noble gases mix homogeneously with the air in the condenser which has a volume of $\sim 10^5$ cubic feet.

3 - Air ejector flow is 300 cubic feet per minute which results in a 30 minute holdup.

4 - A curie decontamination factor of 3 is assumed for the 30 minute holdup.

Using the above assumptions, a stack release of .0257 curies/second above the normal release would result if 4 fuel rods failed. This would be a puff-type release and would drop to a lower equilibrium value. For a new plant, the off-gas release rate should be .010 curies/second or less and for an equilibrium core .025 curies/second or less. Thus, even adding the above release to that due to the assumed flow blockage results in a release which is less than operating limits. In addition, even if the assumption of a homogeneous mixing is wrong by a factor of 10, operational limits are not exceeded.

In conclusion, we believe the likelihood of fuel blockage is very small, but if it did occur, off-gas releases would be below operating limits.