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C000-93-2309

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US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Three Mile Island Nuclear Station Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
TMI-2 Additional Information of Cork Seam

Dear Sir:

GPU Nuclear letter C312-93-2074, dated November 12, 1993, provided a description of the cork seam condition and the additional work to be performed. As a result of that letter, NRC requested additional information in a letter dated November 23, 1993 (TAC No. M69115). The requested information is provided in Enclosure 1 to this letter.

Sincerely Yours,

Robert Long

R. L. Long
Director, Services & TMI-2 Divisions

EDS/dlb

Enclosure

cc: M. G. Evans - Senior Resident Inspector, TMI
T. T. Martin - Regional Administrator, Region I
M. T. Masnik - Project Manager, PDNP Directorate
L. H. Thonus - Project Manager, TMI

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ENCLOSURE 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION ON TMI-2 CORK SEAM CONTAMINATION

1. Will the licensee commit to updating the appropriate section of the Post Defueling Monitored Storage (PDMS) Safety Evaluation Report (SER) (sic) with the cork seam information in the next PDMS SER revision? Provide a short description of the type of information that will be included in the revision.

   RESPONSE: PDMS Safety Analysis Report (SAR) Amendment 20 will contain a subsection in Section 5 regarding the cork seam condition. The information provided will include a description of the current condition and the planned additional work. Since the end result of the ongoing work is not known, i.e., removal of additional cork material or capping of the cork seam, this subsection will be revised in the next amendment following completion of the work.

2. Provide a description of actions that have been taken or are being taken to prevent further inleakage into the cork seam. For each action provide an estimated completion date.

   RESPONSE: Leak repair work is proceeding in three areas at TMI-2 (See Figure 1). Repair 1 repaired the outside vertical seam at the corner of the Fuel Handling Building (FHB) and the Reactor Building, elevation 305' to 345'. This work was completed on November 19, 1993; the water inleakage into the FHB Annulus 280' area following a heavy rain has been practically eliminated.

   Repair 2 will mitigate water inleakage into the M-20 area via the reactor wall corridor, elevation 305', and the CACE/Equipment Hatch Building roof, elevation 342'. This work is expected to be completed by December 15, 1993.

   Repair 3 will mitigate the water inleakage into the Control Building East area via the roof over the Personnel Hatch/Hot Instrument Shop, elevation 331'-6". This work is expected to be completed by December 31, 1993.

3. Provide an estimate of the amount of water and radioactive contamination in the cork seam.

   RESPONSE: The cork seam is one to two inches wide, approximately 600 feet in linear length, and filled with cork to a depth of three to five feet, depending on location. It was originally estimated that there could be a maximum of 1000 gallons of contaminated water in the seam. However, the pumping experience of December 3 and 6, 1993 indicates that there is much less than 1000 gallons of contaminated water in the cork seam. The activity level of a water sample taken from a one-inch diameter core-bored

hole in the Auxiliary Building is listed in Table 1. This hole is located five feet from the Seal Injection Valve Room (SIVR). A water sample extracted from a one-inch diameter core-bored hole in the M-20 area shows no contamination in that area. It is estimated that there is an additional 200 gallons of non-contaminated (i.e., "clean") water in the M-20 area cork seam.

Therefore, based on samples taken over the course of the cleanup including the water sample noted above, the estimate of the total contamination in the seam outside the SIVR is 5 Ci of Cs-137 and 1 Ci of Sr/Y-90. Using these values as a basis, the estimate of the contamination in the cork seam in the SIVR is 15 Ci of Cs-137 and 4 Ci of Sr/Y-90.

4. Describe plans for removing the radioactively contaminated water from the cork seam. Include an estimated completion date.

RESPONSE: The contaminated water in the cork seam will be removed using an air driven pump and staged in a portable batch tank located adjacent to the seam. When the desired level in the tank is reached or the available water in the seam has been removed, the pump will be secured. The contents of the tank will be sampled and then periodically transferred to the Auxiliary Building Sump. The Auxiliary Building Sump is located in a radiologically-controlled area on the 280'-6" elevation of the TMI-2 Auxiliary Building and collects floor drainage from the TMI-2 Auxiliary and Fuel Handling Buildings. The sump is lined with 1/4" stainless steel and has a 10,000 gallon capacity. A 3/8" solid checkered-steel deck covers the sump. Water in the Auxiliary Building Sump can either be staged to the Auxiliary Building Sump Tank or the Miscellaneous Waste Holdup Tank for sampling, chemical analysis, and further processing.

The non-contaminated water will be removed in the same pumping manner but will not be mixed with the contaminated water. It will be processed by normal operations for disposal of clean water.

Based on previous experience, removal of the water in the cork seam will be time consuming. The initial estimate for the amount of time required to remove the water from the cork seam was based on removing 35 gallons of water during each pumping operation. In addition, it was assumed that water would refill the void in the cork seam in approximately one day. Based on these assumptions and a pumping schedule of Monday, Wednesday, and Friday, monitoring the water levels in the cork seam, chemistry sampling and transfer of water to the Auxiliary Building Sump on Tuesday, Thursday, and prior to pumping on Monday, completion of water removal from the cork seam was predicted by March 31, 1994. However, based on the pumping experience of December 3 and 6, 1993, much less than 35 gallons will be removed during each pumping evolution. In addition, recharge of the area of the cork seam where the pump is located will take longer than one day. If the initial estimate of 1,000 gallons in the seam is accurate, then this water removal process will take considerably longer than originally estimated. However, if much less water is in the seam, which appears likely, then March 31, 1994 is still a reasonable date.

5. Describe your monitoring program to monitor water level and contamination containment in the cork seam once the facility enters PDMS.

RESPONSE: During the removal of water from the cork seam, four four-inch diameter dams will be installed to prevent contamination from spreading and to provide monitoring locations, and two additional one-inch diameter holes (2 currently exist) will be drilled for pumping (See Figure 2). The dams will be made from an injectable polyurethane grout. This material adheres to wet surfaces and expands to form a closed cell foam that will fill any gaps in the concrete adjacent to the cork seam. In addition, after the dams and pumping/monitoring holes are installed and the water is removed, GPU Nuclear will evaluate whether additional actions are required, i.e., removal of cork material or capping of the cork seam.

After the water removal process has been completed, a liquid level monitoring device will be inserted in each of the four sections in the one-inch diameter holes. At least monthly, for a period of one year, these holes will be monitored for water entering the seam. The monitoring program will be reevaluated after the initial one year period.

TABLE 1

TMI-2 CORK SEAM WATER SAMPLE ANALYSIS SUMMARY

Gamma Scan	1.72 μCi/ml
Cs-134	.005 μCi/ml
Cs-137	1.71 μCi/ml
H-3	.009 μCi/ml

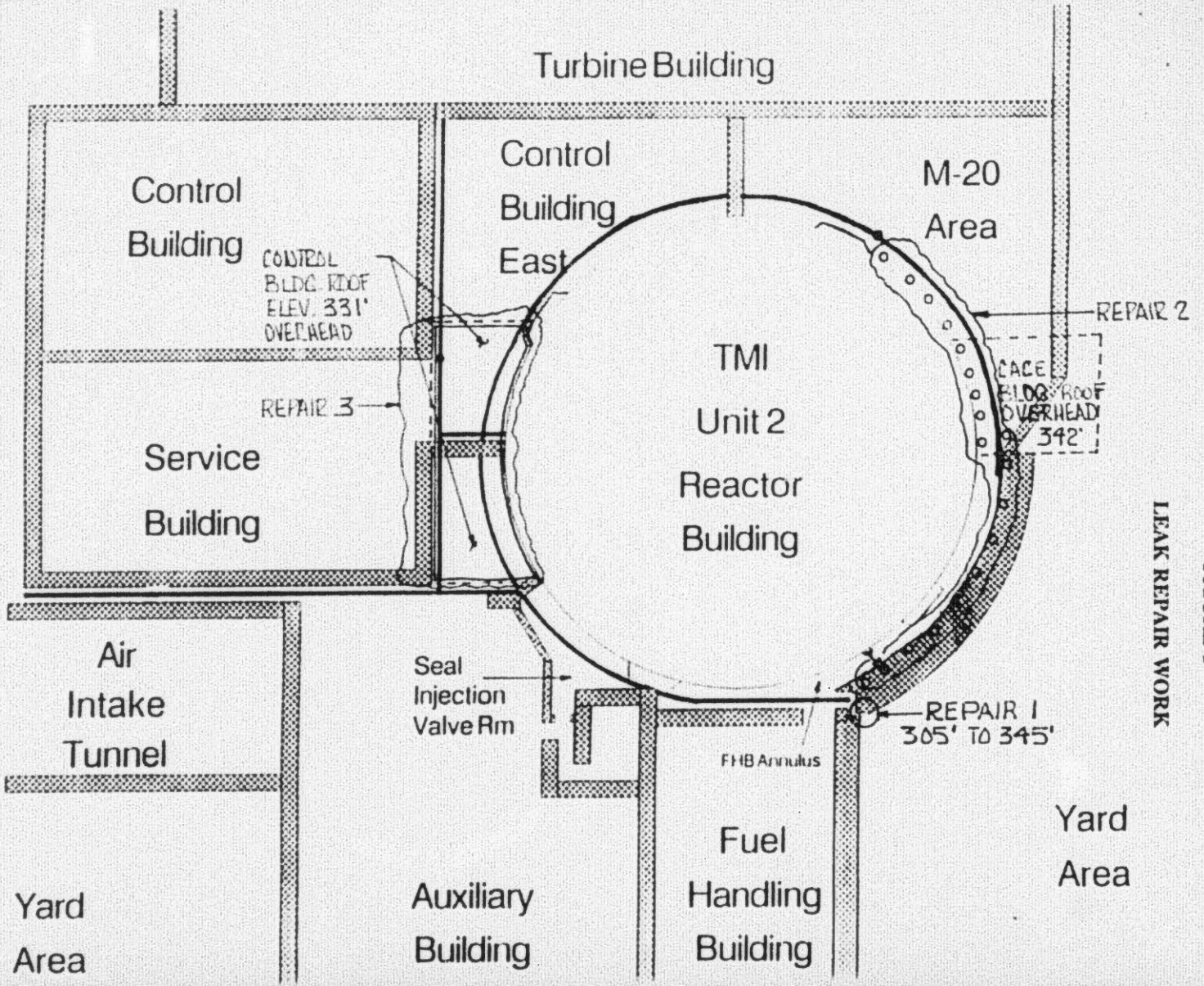

FIGURE 1
LEAK REPAIR WORK

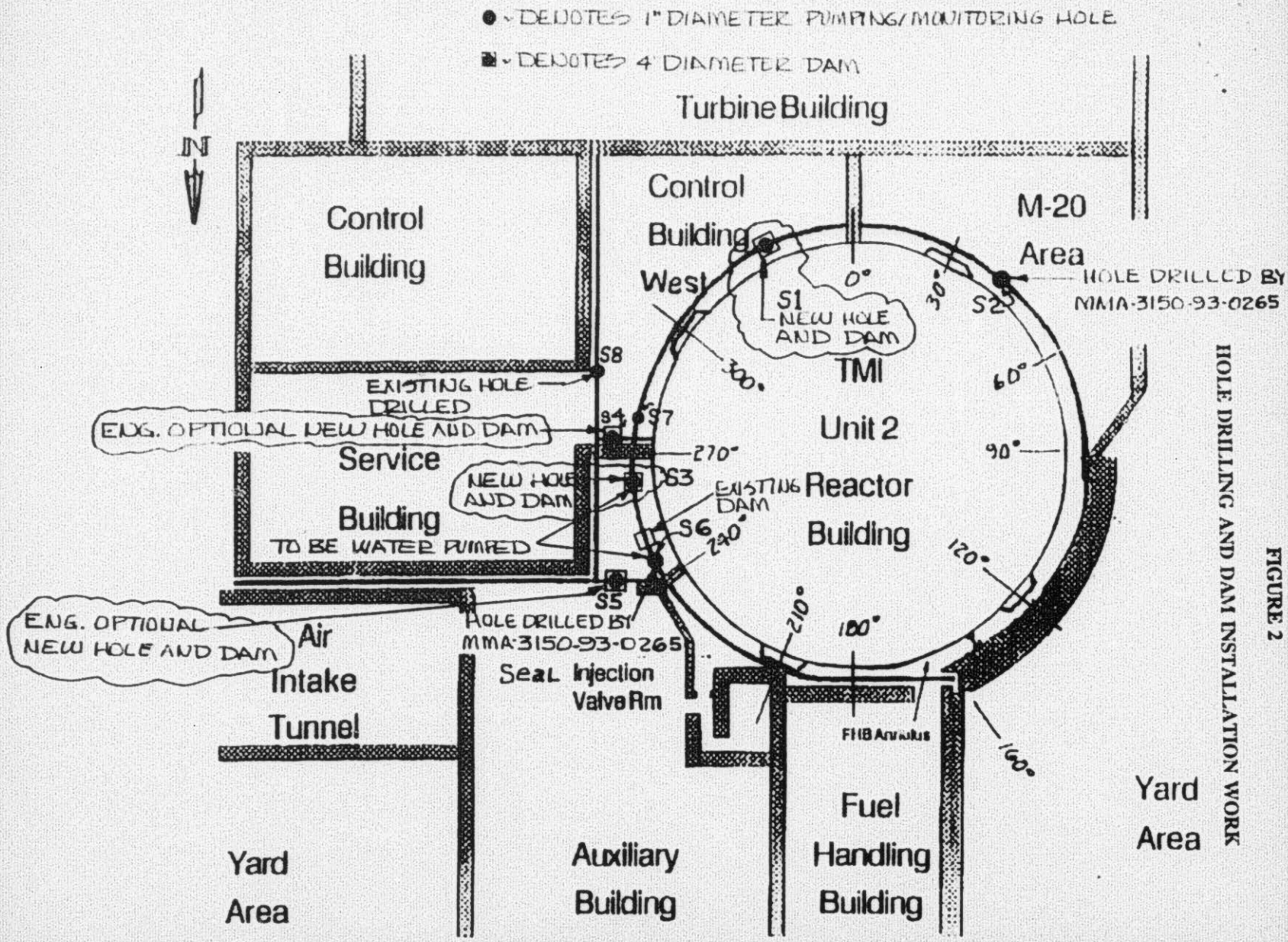

FIGURE 2
HOLE DRILLING AND DAM INSTALLATION WORK