

REGULATORY PACKET FILE COPY

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For: The Commissioners

From: Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Thru: Executive Director for Operations */s/ W. G. ...*

Subject: RELEASE OF KRYPTON GAS IN REACTOR BUILDING PERSONNEL AIR LOCK AT TMI-2

Purpose: Approval of release of a de minimus quantity of krypton-85 gas to allow entry into the personnel air lock in the TMI-2 reactor building.

Discussion: As part of the licensee's program to gather data related to radiation and contamination levels in the TMI-2 reactor building, an entry into the personnel air lock has been planned. This entry would allow sensitive monitoring equipment to measure the intensity and spectrum of the radiation penetrating the window of the inner air lock door. Such data would be valuable in planning a manned entry into the reactor building itself, whether the latter entry is prior to or following disposal of the krypton in the reactor building.

The on-site NRC staff has reviewed the detailed procedures for the air lock entry and finds them acceptable from the standpoint of public health and safety as well as worker protection. These procedures call for the purging of the air lock atmosphere prior to entry. It has long been recognized, however, that a small amount of krypton-85 was trapped in the air lock (a total of about 40 millicuries which yields a concentration of approximately $2 \times 10^{-3} \mu\text{Ci/cc}$ compared to about $1 \mu\text{Ci/cc}$ in the reactor building). This activity reached the air lock and/or by diffusion during the subsequent months. Because of Commission statements which prohibit the venting of the reactor building atmosphere, of which the air lock can be

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considered a part, albeit a very small one, approval to proceed with the entry was not given.

There are several ways to approach this entry vis-a-vis the krypton gas.

1. At these concentrations the workers could enter as is, but of course much of the gas would escape during the personnel and equipment entry process.
2. The air lock atmosphere could be purged into the reactor building, which is still at a negative pressure relative to atmosphere. However, in order to lower the krypton-85 concentration in the air lock to MPC by a feed-and-bleed operation, this would add about 10,000 cubic feet of air into the reactor building, thereby slightly decreasing the margin below atmospheric and increasing the likelihood of positive reactor building when warm weather comes.
3. The air lock atmosphere could be purged into compressed air bottles (20 to 30) and held for eventual disposal.
4. Finally, the air lock atmosphere could be purged through filters to the plant exhaust which would assure that any particulates (none have been measured in the samples) would be retained but the krypton would not be held.

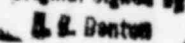
We have evaluated the concentration of krypton-85 at the plant vent exit for option 4 and find that it would be less than MPC for unrestricted areas and about 10^{-3} MPC at the nearest site boundary. The maximum off-site individual total body dose associated with releasing all the Kr-85 contained in the air lock would be less than $0.1 \mu\text{rem}$. The dose rate due to natural background radiation is more than $10 \mu\text{rem/hr}$. Therefore, the dose associated with the Kr-85 release is equivalent to less than 1 minute exposure to natural background. Further, greater amounts of krypton-85 are being routinely discharged through the steam generator turbine exhaust pathway (refer to PN TMI-79-08). Therefore, we believe the release resulting from option 4 should be considered de minimus and that options 1-3, while offering the potential for reduction in release, need not be considered further.

Since it is likely that a decision on disposal of the reactor building krypton is at least several months away, the

licensee is planning an exploratory entry into the reactor building in March or April to make more definitive radiation measurements and take photos and samples of contaminated surfaces. This entry would also cause the release of some krypton by exchange of atmosphere when opening and closing the inner air lock door. However, we believe that these entries can be conducted in a safe and environmentally acceptable manner, and that the information gained will be useful in assuring that the decontamination plans minimize operator exposure and environmental impact.

Recommendation: The Commission approve the discharge of a de minimus level of krypton-85 prior to entry into the reactor building air lock.

Coordination: The Office of the Executive Legal Director has no legal objection.

Original Signed by


Harold R. Denton, Director
 Office of Nuclear Reactor Regulation

Handwritten: 2/19/80

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