

February 20, 1980

SECY-80-105

COMMISSIONER ACTION

For:

The Commissioners

From:

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Thru:

Executive Director for Operations

H. R. Denton

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 milli-
curies 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
while the reactor building was pressurized on March 28
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 pressure and increasing the likelihood of positive reactor building pressure 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.

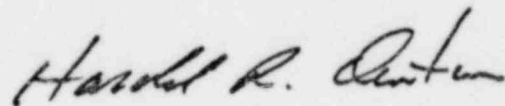
We have evaluated the concentration of krypton-85 at the plant vent exit for option 4 and find that it would be less than MPC for unrestricted areas and about 10^{-3} MPC at the nearest site boundary. The maximum off-site individual total body dose associated with releasing all the Kr-85 contained in the air lock would be less than 0.1 μ rem. The dose rate due to natural background radiation is more than 10 μ 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.



Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Commissioners' comments should be provided directly to the Office of the Secretary by c.o.b. Friday, February 29.*

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT February 26, 1980, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

*SECY NOTE: NRR has requested expedited action on this paper.

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