

December 23, 1985

Docket No. 50-289

Mr. Henry D. Hukill, Vice President
and Director - TMI-1
GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

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Dear Mr. Hukill:

SUBJECT: CONTROL ROOM HABITABILITY REVIEW FOR TMI-1

We have reviewed your latest submittal dated October 18, 1985 concerning control room habitability. As indicated in the enclosed safety evaluation, we do not agree that you have satisfied the control envelope pressurization requirements of NUREG-0737 Item III.D.3.4.

As indicated in the enclosed safety evaluation, our position on control room habitability is that your control room ventilation system must be arranged so that the entire "control tower" as you refer to it is pressurized to 0.10 inch water gauge pressure during accident conditions. Alternatively, you may be able to perform the conservative bounding analysis described in our safety evaluation. (See Item 1 on page 3). But based on a preliminary assessment of the data you provided, we do not believe that such an analysis would demonstrate that your control room operators are adequately protected.

Our review of this NUREG-0737 issue has taken several years to reach this stage. It is time to technically resolve this issue and physically implement the solutions. Our position is stated in the enclosed safety evaluation. If you choose to technically appeal our decision, we will make appropriate arrangements for the proper meetings. By January 24, 1985 you are requested to provide your commitments and schedule for resolving the staff's concerns.

Sincerely,

**Official signed by*

JOHN F. STOLZ

John F. Stolz, Director
PWR Project Directorate #6
Division of PWR Licensing-B

Enclosure:
As Stated

cc w/enclosure:
See next page

AD:PBR

DC Crutchfield*

12/17/85

PBD-6

JStolz

12/23/85

PBD-1

JThoma;cr*

12/16/85

PBD-6

RWeller*

12/17/85

Reviewer

KDempsey*

12/16/85

PEICS

JWermeil*

12/16/85

C:PEICS

OParr*

12/16/85

*See previous white for concurrences.

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PDR AD0CK 05000289
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Sincerely,

John F. Stolz, Director
PWR Project Directorate #6
Division of PWR Licensing-B

Enclosure:
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PECS
JWermeil
12/16/85

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12/16/85

Mr. Henry D. Hukill
GPU Nuclear Corporation

Three Mile Island Nuclear Station
Unit No. 1

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- 3 -

Three Mile Island, Unit 1

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Atomic Safety & Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Atomic Safety & Licensing Appeal
Board Panel (8)
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SAFETY EVALUATION REPORT FOR THREE MILE ISLAND UNIT ONE
WITH RESPECT TO CONTROL ROOM HABITABILITY
TMI TASK ACTION PLAN ITEM III.D.3.4

The staff review of the control room design for Three Mile Island Unit 1 identified a lack of redundancy in isolation dampers in the control room habitability system. As a result of the staff findings, GPU, in a letter dated June 3, 1985, was requested to perform a failure modes and effects analysis considering single failures in the control room ventilation system. GPU was to demonstrate that under the worst single active failure that General Design Criterion 19 dose guidelines were met. In addition, GPU was requested to perform a pressurization test on the control room and demonstrate that a positive 0.10 inch water gauge (W. G.) pressure (with respect to adjoining areas) could be maintained.

The test was performed. A review of the tests results and subsequent discussions with GPU representatives has indicated that the GPU staff and their consultants may have misunderstood the intent of the staff with respect to the conduct of the test. GPU representatives interpreted the staff request for control room pressurization to be applicable only on the control room itself. Industry and staff practice has consistently included all areas served by the control room emergency ventilation system into the "control room envelope." Therefore, when the staff uses the term control room it has always intended to mean all areas served by the emergency ventilation system. The staff notes, however, that there are areas on three levels of the TMI Unit 1 auxiliary building served by the emergency ventilation system (the control room-elevation 355', compartment 2-elevation 338'6" and compartment 3-elevation 322') which communicate directly with each other. The three levels are called the "control tower" by the licensee. Obviously, contamination reaching any of these three areas can result in contamination of the other areas including the control room itself. The intent of the staff requirement was that GPU demonstrate control of the environment in the control room by creating a positive pressure which helps ensure that the post accident flow will be from the control room to other areas, instead of the flow of potentially contaminated air into the control room. To not consider other areas which communicate with the control room via the ventilation system obviously ignores the potential for control room contamination from

these other areas. Because areas in the control tower could not be maintained at a positive pressure (per the test results one such area was almost consistently at a negative pressure), there is the potential for contamination to flow into other areas served by the control tower ventilation system even though the control room is maintained at a positive pressure.

The staff also notes that in another review there were questions concerning the location of the readouts for the air intake chlorine detectors. Regulatory Guide 1.95 specifies that the chlorine monitor readouts should be in the control room. GPU indicated that these monitors were not in the control room proper, but were in an area served by the control room emergency ventilation system. The staff accepted this deviation even though the operator would have to leave the control room because the readouts were to be in a "protected area", i.e., an area with the same ventilation as the control room.

GPU provided an analysis in a letter dated October 18, 1985, to demonstrate that, notwithstanding that certain areas were at a negative pressure in the pressurization test, the control room could be demonstrated to be habitable. The staff has completed its' review and concludes the following:

1. The analyses assumed that post-LOCA containment releases would be entirely into the auxiliary building structure and that uniform mixing would occur (presumably by the auxiliary building ventilation systems). It would appear impossible to substantiate this assumption because there is no guarantee that the auxiliary building ventilation systems would be in operation following a LOCA (electrical components may not be on the essential bus), and because the quantity and location of fission product releases from the containment and components outside the containment cannot be accurately predicted. Leakage could occur in many areas of the auxiliary building and the fact that sneak paths could develop (where fission products could bypass the ventilation systems or even escape volumetric mixing) cannot be dismissed. A conservative bounding approach would be to assume mixing of post-LOCA fission product releases only in the return air flow of the control room emergency

ventilation system. However, based on the data you submitted we do not believe that your control room can be found acceptable using this approach.

2. The way to conclusively demonstrate control over the fission products reaching the control room is to ensure that the entire area served by the control tower emergency ventilation system is at a positive pressure.

As a result of the above, the staffs position is that GPU should perform a test that successfully demonstrates that all areas of the control room envelope can be maintained at a positive pressure of 0.10 inch water gauge or show that control room dose, using a bounding conservative approach relative to the mixing of fission product, is within the guidelines of GDC 19. Until this matter is resolved, the staff is unable to conclude that the TMI Unit One operators are adequately protected, and that GPU has met the requirements of NUREG-0737, Item III.D.3.4.