May 30, 1980 SECY-80-132E

COMMISSIONER ACTION

For: The Commissioners

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

Thru: Executive Director for Operations

Subject: DECONTAMINATION OF THE THREE MILE ISLAND UNIT 2 REACTOR BUILDING ATMOSPHERE

Purpose: Approval of the release of krypton-85 from TMI-2 reactor building atmosphere by controlled purging.

Discussion: A draft Environmental Assessment for Decontamination of the Three Mile Island Unit 2 Reactor Building Atmosphere (NUREG-0662, March 1980) was submitted to the Commission as an enclosure to SECY-80-132 on March 11, 1980. Two addenda to this EA were also issued. Addendum 1 referenced studies that have been done on the psychological stress issue while Addendum 2 covered the possibility of a quicker purge. The public comment period on all three documents was extended one month to May 16, 1980, at the request of Pennsylvania's Governor Thornburgh.

The reactor building atmosphere needs to be decontaminated in a timely manner primarily to permit less restricted access to the reactor building necessary to gather information, to maintain equipment, and to proceed toward total decontamination of the Unit 2 facility. At present, the Kr-85 dispersed inside the reactor building atmosphere limits operations which could be conducted inside the building to preliminary contamination data gathering. Following decontamination of the reactor building atmosphere, larger scale activities, such as detailed radiation mapping, preliminary decontamination, and shielding placement, will be possible since lowered radiation exposure levels will reduce the need for personnel protective gear.

At the close of the comment period approximately 800 responses had been received. The staff has evaluated all comments and in response has prepared a Final EA which is enclosed. Section 9.0 of the Final EA contains the staff responses to the comments. Additionally, the

tact:
Snyder, NRR

SECY NOTES: This paper is identical to advance copies [illegible] were delivered to Commissioner residences on May [illegible]

This paper is currently scheduled for discu[illegible]
Commission meeting on Thursday, June 5, [illegible]

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other sections of the Final EA have been considerably revised in response to the comments received, and subsequent analyses conducted by the staff. All substantive comments received are being reproduced as Volume II of the Final EA and will be made available to the public. Comments were received from various Federal, State, and local agencies and officials, from nongovernmental organizations, and from private individuals. The comments generally received fell into one of three categories: (1) those supporting the purging alternative recommended by the NRC staff (approximately 195 responses), (2) those opposed to the purging alternative (approximately 500 responses) and (3) those who recommended decontamination alternatives other than those discussed in the Draft EA or who otherwise commented on the assessment (approximately 105 responses). The third category also included all other comments on the five alternatives evaluated in the draft EA, as well as suggestions for additional methods for decontaminating the TMI-2 reactor building atmosphere.

A number of the comments discussed the psychological stress and physical health effects of the staff's recommendation to purge the reactor building atmosphere to the environment. Consequently, a new section covering these aspects (Section 7.0) was added to the Final EA. This new section discusses both the physical health effects (Section 7.1) and the psychological stress (Section 7.2) of the decontamination alternatives. In the section on psychological stress, the staff, with professional input from consulting psychologists has concluded that, in the long term, the psychological stress resulting from atmospheric purging will be less severe than from any of the other decontamination alternatives. Purging the reactor building can be accomplished sooner than any of the other decontamination alternatives and will, therefore, result in stress of shorter duration relative to the other alternatives.

The following table summarizes the staff's assessment of the most optimistic times required for starting decontamination of the building atmosphere for each alternative method considered. The alternatives other than purging would use considerably more complex equipment and processes and would thereby prolong the uncertainties and associated

stress over the possibility of accidental releases. In addition, removing Kr-85 from the reactor building is anticipated to be perceived as a crucial first step in progress toward overall decontamination of TMI-2 with elimination of the potential for future public risk from the unit. It is anticipated that a prompt, decisive decision will help to reduce public anxiety over the cleanup activities at TMI-2.

ALTERNATIVE METHOD	MOST OPTIMISTIC TIME FOR SYSTEM AVAILABILITY
Slow Purge - 160 Ft. Stack	Immediately available*
Fast Purge - 160 Ft. Stack	Immediately available*
Fast Purge - 400 Ft. Stack	4 months
Fast Purge - 250 Ft. Incinerator/Stack	7 months
Fast Purge - 1000 Ft. Stack	11 months
Fast Purge - 2000 Ft. Balloon/Tube	7 months
Selective Absorption	16 months
Charcoal Absorption	24 months
Gas Compression	25 months
Cryogenic Processing	20 months
Combination Process/Purge	12 months

*After 10 day public notification.

As noted in SECY-80-132D, the TMI-2 Appendix B Technical Specifications include a noble gas release rate limit of 7200 μCi/sec (622 Ci/day) when averaged over a calendar quarter. This quarterly averaged release rate limit is based on not exceeding, in one quarter, four times the annual Appendix I dose design objective. Based upon a 90-day calendar quarter, this limit restricts the maximum noble gas release during a calendar quarter to approximately 55,980 Curies which is slightly less than the 57,000 Curies of Kr-85 contained in the reactor building. Therefore, to preclude exceeding this Technical Specification limit, it will be necessary to per-

form the purging operation (if approved) during two calendar quarters and to release at least 1,020 Curies prior to the beginning of the third calendar quarter on July 1, 1980. Release of at least 1,020 Curies can be accomplished in two days. To provide adequate allowances for contingencies and to allow for adequate (10 days minimum) prior public notice of the planned purging operation, the purging operation should be approved by June 13, 1980. Otherwise, purging would need to be extended into the fourth quarter, starting October 1, 1980.

As noted in Section 1.0 of the Final EA, the staff has concluded that purging of the reactor building atmosphere should be authorized and will have no significant adverse impact on public health and safety and no significant environmental impact. In view of the determination that there will be no significant environmental impact, the staff does not propose to prepare a separate Environmental Impact Statement on this action consistent with the requirements of NEPA and the Commission's regulations. A draft negative declaration to this effect has been prepared and is enclosed for your consideration. The staff has also concluded that it is in the best interest of the public health and safety to proceed with this activity prior to completion of the Programmatic Environmental Impact Statement.

However, the staff has prepared a comprehensive environmental assessment of all reasonable options for decontaminating the reactor building atmosphere and this is contained in the Final EA (NUREG-0662, May 1980) - Volume I, which is being printed over the weekend of May 30-June 1 for public release on June 2 as the staff's recommendation. The attached press release, prepared by PA, will be used for this purpose. Volume II, which will include all substantive comments received, will be published next week.

Recommendation: After review of the comments received and further staff analyses of alternatives, we continue to recommend that controlled purging of the TMI-2 reactor building atmosphere be authorized. We further recommend that the enclosed draft negative declaration be approved and that the decision to authorize purging be announced by June 13, 1980 in order to permit compliance with existing license limitations.

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

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosures:
1. Final Environmental Assessment NUREG-0662 (May 1980) - Volume I
2. Draft Negative Declaration Regarding Purging of Three Mile Island Nuclear Station, Unit No. 2 Reactor Building Atmosphere
3. Press Release

Commissioners; comments should be provided directly to the Office of the Secretary by c.o.b. Thursday, June 5, 1980.

Commission Staff Office comments, if any, should be submitted to the Commissioners NLT June 4, 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.

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UNITED STATES NUCLEAR REGULATORY COMMISSION

NEGATIVE DECLARATION

REGARDING PURGING OF THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 2

REACTOR BUILDING ATMOSPHERE

DOCKET NO. 50-320

The U.S. Nuclear Regulatory Commission has reviewed Metropolitan Edison Company's, et.al. (licensee) proposal to decontaminate the reactor building atmosphere and alternatives thereto, at the Three Mile Island Nuclear Station located in Londonderry Township, Dauphin County, Pennsylvania. The U.S. Nuclear Regulatory Commission has determined that this decontamination needs to be performed soon and that it can be performed with no significant environmental impact by purging the Unit 2 reactor building atmosphere to the environment.

The Office of Nuclear Reactor Regulation prepared a final Environmental Assessment (NUREG-0662, May 1980) in connection with this action. It was determined that this action will not result in any significant health effects or other significant environmental impacts. Thus, in accordance with the National Environmental Policy Act and based on this finding, no Environmental Impact Statement will be prepared.

The final Environmental Assessment (NUREG-0662, May 1980) is available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C., and at the Three Mile Island Unit No. 2 Local Public Document Rooms in the Government Publications Section, State Library of Pennsylvania, Education Building, Commonwealth and Walnut Streets, Harrisburg, Pennsylvania 17125, and at the York College of Pennsylvania, Country Club Road, York, Pennsylvania 17405. Copies may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 Attention: Director, Division of Technical Information and Document Control.

FOR THE NUCLEAR REGULATORY COMMISSION

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, MD
this day of June, 1980.

FINAL TMI-2 ENVIRONMENTAL ASSESSMENT
ISSUED BY NRC STAFF

The Nuclear Regulatory Commission staff has recommended that the Commission approve decontamination of the reactor building atmosphere at Unit 2 of the Three Mile Island Nuclear Power Station in Pennsylvania by controlled purging to the environment.

The recommendation is contained in the staff's final environmental assessment of the decontamination issue. The assessment will be used by the Commission in making a final determination.

As a result of its review, the staff has concluded that:

1) The potential impact on the physical health of the public -- using any of the alternatives for removing 57,000 curies of radioactive krypton gas from the building atmosphere -- is negligible. This conclusion has been confirmed by independent reviews by the National Council on Radiation Protection and Measurements (NCRP), the Environmental Protection Agency (EPA), the Department of Energy (Assistant Secretary for Nuclear Energy), and the Union of Concerned Scientists (UCS).

2) The potential psychological impact or stress is likely to grow the longer it takes to initiate and complete the decontamination process.

3) The purging method is the quickest and safest for Three Mile Island workers to accomplish.

4) If nothing were done, an important phase of the Three Mile Island 2 cleanup program would be left undone and would carry other risks. First, it would be physically more difficult for workers to do anything in the building because of the heavy protective clothing and the air supply equipment they would have to wear. Second, to the extent that it would interfere with maintenance of equipment in the building, indefinite delay might cause failure of equipment essential to keeping the damaged reactor core in a safe condition. And, third, the building could begin to leak unexpectedly.

If the staff's recommendation is approved, the reactor building atmosphere would be purged, using the existing hydrogen control system, through a 160-foot high vent stack. The purging would be done under meteorological conditions favorable to dispersion of the krypton in the atmosphere, and would take about two months.

Other alternatives considered in the environmental assessment include:

1) Variations of the purging alternative including a "fast" purge, release of the krypton at higher elevations, and heating the atmosphere as it is purged.

2) Passage of the atmosphere through charcoal filters which would trap the krypton (charcoal adsorption).

3) Condensing the krypton with liquid nitrogen, concentrating it and storing it in vessels at an onsite facility (cryogenic processing).

4) Separation of the krypton from gases in the atmosphere using a liquid fluorocarbon, condensing it, and storing it, in shielded containers under pressure (selective absorption).

5) Drawing off the reactor building atmosphere into suitable pressurized storage containers (gas compression).

6) A combination of purging and other alternatives.

7) Do nothing.

The report is titled "Final Environmental Assessment for Decontamination of the Three Mile Island Unit 2 Reactor Building Atmosphere" (NUREG-0662 - May 1980). It is available for public inspection in the Commission's Public Document Room at 1717 H Street in Washington, D.C., and at the TMI-2 Local Public Document Rooms at the Government Publications Section, State Library of Pennsylvania, Education Building, Commonwealth and Walnut Streets in Harrisburg and at the York College of Pennsylvania, Country Club Road, York.

Single copies may be obtained by writing to the Director, Division of Technical Information and Document Control, Nuclear Regulatory Commission, Washington, D.C. 20555, or at the NRC's Middletown, Pennsylvania, office -- the Middletown Mall, 100 Brown Street.

NUREG-0662
Vol. I

Final Environmental Assessment for Decontamination of the Three Mile Island Unit 2 Reactor Building Atmosphere

Final NRC Staff Report

TMI Support Staff
Office of Nuclear Reactor Regulation

Prepared for
U.S. Nuclear Regulatory
Commission

Available from

GPO Sales Program
Division of Technical Information and Document Control
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

and

National Technical Information Service
Springfield, Virginia 22161

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

ERRATA SHEET

FOR

"Final Environmental Assessment for Decontamination of the Three Mile Island Unit 2 Reactor Building Atmosphere"

NUREG-0662, Vol. 1

Please note and correct the following errors:

Page

1-1. In the second paragraph, replace March 29, 1979 with March 28, 1979.

1-1. In the second sentence of the fourth paragraph, replace March 1979 with March 1980.

1-3. In Section 2. Purging, replace the second sentence with the following: "The smaller of the two systems was designed as a backup system to the hydrogen recombiner system to reduce the hydrogen concentrations to prevent possible gas explosions."

6-11. In Section 6.2.5.3.3. Environmental Impact, final sentence, replace viable with visible.

6-31. In Section 6.8. Onsite Long-Term Storage of Krypton-85, first paragraph, first sentence, delete the final four words "or off-site disposal."

6-32. In Table 6.8-1, under the Advantages column, first item, the expression "low peak" should read "low leak".

9-2 Final paragraph on this page, delete the last sentence.

9-5 Replace first new paragraph on the page with the following: "Dr. Henry W. Kendall, UCS chairman, said the organization ultimately decided to recommend against implementation of the existing Met Ed/NRC venting plan, but he emphasized that this was primarily because of the stress problem."

12-2. MDA should be defined as Minimum Detectable Level.