UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
THE ADMINISTRATOR

Dr. Bernard J. Snyder, Progam Director
Three Mile Island Program Office
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dr. Snyder:

In accordance with Section 309 of the Clean Air Act, as amended, the U.S. Environmental Protection Agency (EPA) has reviewed the Draft Programmatic Environmental Impact Statement (DPEIS) Related to Decontamination and Disposal of Radioactive Wastes Resulting from the March 28, 1979 Accident at Three Mile Island Nuclear Station, Unit 2 (NUREG 0683).

EPA has been involved in monitoring the impacts of this accident on the environment since March 30, 1979, so we are in a unique position to recognize the unusual nature of this action. We commend the Nuclear Regulatory Commission's determination to protect public health and the environment during the decontamination of Three Mile Island, Unit 2 (TMI-2) and the permanent disposal of the resulting radioactive wastes.

EPA's detailed comments are attached; our major concerns are described below. We hope they assist the Nuclear Regulatory Commission (NRC) in the selection of alternatives in authorizing and licensing utility actions during clean up and disposal. The final programmatic EIS (or a supplement to the DPEIS) should provide more information on:

(1) the amount, nature, and disposition of radioactive wastes from the TMI-2 decontamination;

(2) the health effects associated with various levels of exposure (public and occupational);

(3) the effects of possible transportation accidents;

(4) the cumulative effects on the public of all exposures suffered as a result of the accident (this would include the krypton-85 venting);

(5) the estimated costs of the clean up actions; and

(6) the psychological impacts of each alternative.

EPA believes that the FPEIS should be organized in such a fashion that all information pertaining to an alternative be contained in one section. The FPEIS should be written in plain language so that the public can readily understand it.

EPA recommends that the NRC issue a supplement to the DPEIS which satisfies the concerns which we have regarding the inadequacies in the DPEIS. EPA also recommends that NRC issue supplements to the FPEIS as additional data and information become available during the clean up operations.

Should you or your staff have any questions about our comments, please call: Mr. Jeremiah Manley (NEPA Matters, 755-0770) of my staff; Mr. Terrance McLaughlin (Technical Matters, 557-7604) of EPA's Office of Radiation Programs; or Mr. Matthew Bills, Senior EPA Coordinator for TMI, (Monitoring Matters, 426-4452) of EPA's Office of Research and Development.

Sincerely yours,

William N. Hedeman, Jr.
Director
Office of Environmental Review

Attachment

U. S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

DETAILED COMMENTS
ON THE
DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (DPEIS)
RELATED TO
DECONTAMINATION AND DISPOSAL OF RADIOACTIVE WASTES
RESULTING FROM THE
MARCH 28, 1979, ACCIDENT AT
THREE MILE ISLAND NUCLEAR STATION, UNIT 2
(DOCKET NO. 59-320, NUREG - 0683)

1. The FPEIS, or the supplement to the DPEIS, should clearly identify the type and amount of radioactive wastes as an inventory. This should include the high specific activity wastes, damaged fuel elements, decontamination liquids, and those of processed water anticipated during cleanup. It should also include those amounts that are estimated to have been inadvertently vented during the accident and intentionally vented during the bulk krypton-85 and weekly/monthly ventings.

2. The FPEIS or Supplement should detail the options available now and the best available estimates of options available in the future (i.e., the reasonable expectation of time to be considered for clean up operations) for the ultimate disposal of the radioactive wastes from the decontamination.

3. The FPEIS should clarify the statements made on the subject of transportation of radioactive liquids and should rigorously explore and evaluate all reasonable alternatives.

4. The FPEIS should address the technical feasibility of the off-site deep well injection as well as that of ocean disposal. We recognize that legislative, administrative, and other obstacles may currently prevent the use of some alternatives. But we urge the NRC to address all technically possible alternatives and their costs in the FPEIS. This would then allow the recommendation of changes in legislation and/or regulation to allow the selection of a technically superior alternative for waste disposal.

5. The FPEIS, regardless of preferred alternative for disposal of low specific activity processed water, should provide an assessment similar to that done for the krypton-85 venting. It would be beneficial in showing not only the worst case impacts but also the best controlled conditions for minimizing radiological exposure, psychological stress, and other impacts.

6. The FPEIS should eliminate the inconsistencies in waste and tritiated water inventories as well as clarify the occupational exposures should tritiated water be used in decontamination. Ventilation failure accidents could lead to significant exposures.

7. The DPEIS includes the alternative of releasing liquids into the Susquehanna River. Two alternatives for liquid disposal a: permanent storage on site or evaporation. These liquids represent what is left after the 480,000 gallons of radioactive water has passed through a treatment phase which is likely to be an ion-exchange (EPICOR II). The resulting water would then be mixed with uncontaminated water so that it satisfies EPA's interim drinking water standards (40 CFR 41) at the plant discharge.

The plan to meet the drinking water standards calls for mixing the radioactive liquid and dilution water at the respective rates of 0.8 gpm and 36,000 gpm. It would take 416 days to discharge all this water to the river. To demonstrate that this procedure would work consider the data tabulated below:

Isotope	Input Concentration (pCi/)	Output Concentration* (pCi/l)	Concentration when mixed with Dilution Water (pCi/l)	Concentration that Gives a dose of 4 mrem/yr to a Critical Organ (pCi/l)
Cs-137	8.4×10^{9}	8.4×10^{5}	18	200
Cs-134	1.4×10^{9}	1.4×10^{5}	3.3	80
Sr-90	1.4×10^{8}	1.4×10^{4}	0.33	8
Sr-89	3.2×10^{7}	3.2×10^{3}	0.07	80

As can be seen from this analysis the concentration using the evaporation/resin process is at least an order of magnitude below the drinking water standards. However, a number of questions arise. The mixing ratio of 0.8/36,000 is a very large one. The FPEIS should indicate how this is to be achieved, whether it is possible to get reasonably complete and uniform mixing with this big a difference, and is range of the potential variations in concentration.

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*Effluent from processing decontamination liquids by the evaporation/resin process.

The fate and transport characteristics of the liquid waste will depend on the properties of the radioactivity contained. The isotopes listed above are the main contaminants; however, others are present and comprise a wide variety of chemical elements. The different chemical elements would behave in different ways. For example, if the radioactivity was in ionic or particulate form, what would determine where it would go? If the radioactivity were part of the particulate fraction, it might sink to the river bottom and become part of the sediments. This would not be a permanent sink and could, for example, be stirred up in a dredging operation. Has the possible problem of a buildup of radioactive sediments been investigated?

In some cases, chemicals are more toxic to aquatic life than to humans. Is the radioactivity in this case more toxic to humans or aquatic life? Fish and other aquatic life are known to bioconcentrate metals and other toxic substances. What are the biocentration rates for these radioisotopes being ingested by aquatic life indigenous to the Susquehanna River? What is the resulting human exposure from eating such fish?

8. The FPEIS should correct the statements made in the DPEIS concerning EPA's activities in the following sections:

I. Section 11.3

(a) Effective 12/31/80, EPA will have 13 stations out to 5 miles.

(b) Analyses are done at EPA's TMI Field Station, Middletown. The Harrisburg setup was phased out in June 1980.

(c) Sample and analysis frequency is now once per week for the charcoal filters and 3 times per week for the particulate prefilters. Both will be changed to once per week as soon as telemetered gamma monitors are installed.

(d) The TLD dosimeter layout was changed the first week in October, 1980 to that given in Appendix D to EPA's Long Term Monitoring Plan, revision 2, to be provided to NRC shortly.

(e) Weekly continuous compressed gas samples are taken for Kr-84 analysis at Bainbridge, Goldsboro, Middletown, Hill Island, and the TMI Observation Center. The Hill Island Station was pulled October 3, 1980 because of pending shut down of the marina where the boat is kept. The Kr sampler at Bainbridge will be moved to Yorkhaven Jan 1, 1980 when the Bainbridge station is shut down.

(f) As soon as the samplers are built and analysis arranged (approximately Dec. 1980) tritium in air samples will be taken at the same stations as the Kr samples.

(g) EPA also collects and analyzes water samples as follows: (EPA does gamma spectroscopy, DER analyzes for tritium, gross alpha and gross beta; weekly composites are analyzed for Strontium 89 and 90 at the Eastern Environmental Radiation Facility, EPA, Montgomery, Ala.)

(1) TMI Outfall (All plant discharge, both units) - daily,

(2) Lancaster Water Works intake - daily,

(3) City Island - (upstream river water) - weekly, and

(4) Sediment pond, TMI (run off water) behind Unit 2 cooling tower.

There is a continuous gamma monitor on the 001 TMI outfall with a high-level alarm that automatically alerts EPA and DER to the presence of gamma activity in the water in excess of 1,000 pCi/l 137Cs (1/20 of permissible level).

(h) EPA Press releases are now on a weekly basis on Friday.

II Section 11.5.3

Community Monitoring Program. Most of the EPA recorders have been pulled back to the test site due to equipment shortages in the off-site monitoring program. Units remain at Newberry, Fairview and West Donegal. Reports are no longer issued on a daily basis.

III Appendix M

This Appendix has been substantially revised and will be made available to the NRC shortly.

9. The FPEIS should explain why, in spite of the fact that the decontamination is going to be done using processed water containing tritium at concentrations up to 0.98 uCi/cm^3, no mention is made of tritium as an occupational hazard. Perhaps this is factored into the doses given, but the specifics should be given more clearly. Tritium is both an inhalation and immersion hazard, but the occupational dose discussions appear to be limited to the external dose. Tritium is also omitted from several tables in Section 6 where it should appear (cf Tables 6.4-5, 6.4-6, 6.5-1 through 6).

10. The FPEIS should correct the following items with regard to Kr-85:

(a) Page 2-13, Sect 2.2.1.4. Not all of the Kr-85 has been removed. There is still potential for the release of more during water treatment and during the defueling operations.

(b) Sect 6.1. Kr-85 may still be coming from the primary coolant and the fuel rods. If so, this should be stated and factored into cumulative impacts and inventories.

(c) Sect 6.1.4 Should note the initial problems with the particulate alarm system, the cause thereof, and the resolution. The presence of the EPA Onsite Coordinator in the control room during purging should be noted.

(d) Table 6.1-2 and sect 6.1.6. Should include a comparison of the measured doses - EPA, Met Ed etc. - to the estimates presented. It may be reassuring to the public to show how conservative the estimates being made actually are.

(e) Sect 8.1.4.1 What about Kr-85 release?

(f) Sect 8.1.5.3, 3rd pp. line 6. If Kr-85 releases can vary by a factor of 500 from the estimated 100 Ci, we have a real problem. It is intended that the actual doses resulting from a given release will be within a factor of 500 of the prediction.

The entire question of the isotope balance for Kr-85 is unclear. It would be very helpful to state how much was present in the rods before the accident, how much was released in the accident and during the purging, and how much is left. Taking the number of fuel assemblies (177) and the 320 Ci of Kr-85 per 8.2.4.2 one could estimate about 56,000 Ci of Kr-85 in the reactor. This may represent the activity that was present with all rods intact. This should be clarified.

(g) Table 10.1-4. The 8.5×10^{8} uCi. entry under Kr-85 may be in error. Should not it be 4.3×10^{-10}?

11. The FPEIS should clarify the discussion of accident scenarios. The scenario on page 6-27 appears to indicate that the total exposure resulting from the accidental release of 500,000 gallons of water from storage over a two-hour period would be less than that from a planned release. Do you mean to imply that the alternative of rapid discharge to the river is preferable?

12. The FPEIS should clarify the statements in the DPEIS that there are 51,000 Ci of Krypton-85 in the core. There is no mention of it being in the primary coolant.

13. The FPEIS should include a discussion of the technical feasibility of ocean dumping of low-level radioactive wastes. The current Ocean Dumping Regulations can be found in the Federal Register of Jan 11, 1977 with the criteria for disposal in Section 227.11. We believe this is necessary to fulfill the mandate of NEPA for assessing all feasible alternatives, even though we recognize that, as a matter of policy, no permit has been issued by EPA to ocean dump radioactive waste at any level, and that there has been no ocean dumping of radioactive wastes since 1967. Neither the Marine Protection, Research, and Sanctuaries Act (MPRSA) nor the London Dumping Convention (LDC) preclude the dumping of low-level radioactive wastes; they prohibit the ocean dumping of high-level radioactive wastes. The designation of disposal sites requires an application to EPA with the applicant responsible for time consuming, expensive studies, and for monitoring to assure selection of an environmentally sound alternative.

MEMO ROUTE SLIP
Form AEC-93 (Rev. May 14, 1947) AECM 0240

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