



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

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OCT 24 1980

Ms. Nancy R. Marter  
315 Aspen Street  
Middletown, Pennsylvania 17057

Dear Ms. Marter:

Your letter to Commissioner Gilinsky about the release of radioactive material from the Three Mile Island nuclear station and its effects on your family was referred to me for response. I regret that this answer has been delayed. The accident and its consequences have created a substantial increase in the agency's workload, which has prevented me from responding to you as promptly as I would have liked.

To answer your question regarding krypton, it is one of the basic chemical elements found in nature. It is a colorless gas found in trace amounts in the gases from hot springs and volcanoes, and occurs in the Earth's atmosphere in a ratio of 1 part krypton to 109,000 parts air. It is relatively inert (i.e., forms very few chemical compounds). About seven forms (isotopes) of krypton exist, one of which, krypton-85, is radioactive. Krypton-85 is produced during the fission of uranium in nuclear reactors.

With regard to your concern about the purging of the radioactive krypton gas from the reactor building of TMI Unit 2, Metropolitan Edison Company submitted to NRC a "Safety Analysis and Environmental Report" (November 13, 1979) in which it evaluated alternative methods for the disposal of the krypton gases, such as purging and cryogenic processing, and selective absorption. NRC also evaluated alternative methods for disposal of the krypton gas to determine what effect decontamination would have on workers, on the public health and safety, and on the environment. Based on its evaluation, NRC issued an environmental assessment (NUREG-0662 and two addenda) for public comment on March 26, 1980, and received approximately 800 comments. These comments were considered in the staff's preparation of the "Final Environmental Assessment for Decontamination of the Three Mile Island Unit 2 Reactor Building Atmosphere" (NUREG-0662), vols. 1 and 2, copies of which are enclosed for your information.

From this process have emerged the following NRC staff conclusions:

- The potential physical health impact on the public of using any of the proposed strategies for removing the krypton-85 is negligible.
- The potential psychological impact is likely to grow the longer it takes to reach a decision, get started, and complete the process.

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- The purging method is the quickest and the safest for the workers on Three Mile Island to accomplish.
- Overall, no significant environmental impact would result from use of any of the alternatives discussed in the assessment.

On June 12, 1980, the Commission issued an Order for Temporary Modification of License, authorizing controlled purging of the krypton-85 from the reactor building atmosphere. In a separate Memorandum and Order, also issued on June 12, 1980, the Commission discussed rationale for its decision. Actual purging operations began on June 28, 1980, and were completed on July 11, 1980. The doses resulting from the purge were well within those predicted in section 7.1 of volume 1 of NRC's final environmental assessment. Copies of both Commission issuances are also enclosed.

The small dose of radiation that people in the area received came from radioactive gases that escaped from the auxiliary building. The average dose of radioactivity the population within 50 miles of TMI received was approximately 4 millirems. The maximum exposure to any individual was less than 100 millirems, which is less than the yearly dose each person receives as a result of natural background radiation. Doses at these levels result in less than one health effect over the lifetime of all people in this area. Natural background radiation people in the Harrisburg area receive is approximately 125 millirems per year. To put these doses into perspective, note that a traveler flying round trip by jet from New York to Los Angeles receives 5 millirems of cosmic radiation.

All discharges of water into the Susquehanna River have been carefully monitored since the accident occurred. Your letter refers to the release to the river of 4,000 gallons of water containing strontium-90, a radioactive element that emits beta radiation. The entire event started as a normal routine release of waste water from the Unit 1 waste evaporator condensate test tank. Prior to initiating a release, the licensee is required by plant technical specifications to sample the contents of the tank and analyze the sample for the principal gamma emitters. In addition, the licensee is required by the technical specifications to take a portion of that sample and add it to the composite sample of all previous batches of liquid releases made during the month. At the end of the month the composite sample is analyzed for strontium-89 and -90. The licensee completed both of these actions. It should be noted that the NRC does not require that the analysis for strontium be performed on every batch prior to release because the concentration of strontium is normally well below the detection limits of the analytical method and orders of magnitude lower than the principal gamma emitters, such as iodine and cesium.

On July 26, 1979, the release from Unit 1 was initiated; during the release an NRC inspector questioned the licensee as to whether or not a gross beta analysis had been performed. At that point, Metropolitan Edison management suspended the

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release and performed a number of analyses. The analysis for concentrations of strontium-89 and -90 indicated that prior to discharge to the river, the effluent concentrations for these isotopes were within both federal and state government standards for radioactivity. In the future, nevertheless, Metropolitan Edison will monitor all water discharges for beta radiation.

Except for releases to the Susquehanna River of liquids containing only low or nondetectable levels of radioactivity, the release of contaminated water is not currently permitted. The Commission authorized use of the EPICOR-II water treatment system for processing the waste water stored in tanks in the auxiliary building. We do not currently permit the discharge of water processed by the EPICOR-II system. The disposal of the water processed by EPICOR-II is addressed in the Programmatic Environmental Impact Statement (PEIS) on the decontamination and disposal of radioactive waste at Three Mile Island. Also enclosed for your information is a copy of the PEIS.

As a result of releases containing only low or nondetectable levels of radioactivity, the levels of radioactivity in the Susquehanna are indistinguishable from existing background levels at public water supply intakes from the river. These levels have been confirmed by independent measurements made by the NRC, the Environmental Protection Agency, and the Commonwealth of Pennsylvania.

With regard to your question about whether Metropolitan Edison will be fined, the Commission issued the following press release on January 23, 1980:

The Nuclear Regulatory Commission staff has imposed a \$155,000 fine on Metropolitan Edison Company for items of noncompliance with NRC regulations associated with the March 28, 1979, accident at Unit 2 of the Three Mile Island Nuclear Power Station.

The items of noncompliance involved: inoperable equipment, health physics, failure to follow specified procedures, emergency training and drills, operation of the plant with reactor cooling system leakage in excess of permissible limits, and maintenance of records of worker exposure to radiation.

Based on the company's December 5 response to an October 25 letter proposing the fine, the staff found that three items of noncompliance originally cited could not be substantiated and the fines were remitted. However, the proposed total fine of \$155,000 was not reduced since it is much less than the cumulative fine of \$717,000. The Atomic Energy Act limits to \$25,000 the cumulative fine for any item of noncompliance in any 30-day period.

Metropolitan Edison has since paid the fine of \$155,000.

There is no reason for you to take your children away from Middletown because of the cleanup operations at Three Mile Island.

Ms. Nancy R. Marter

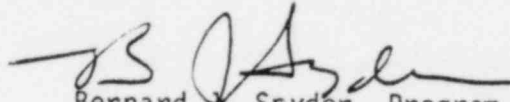
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I am also enclosing a copy of the summary of "Population Dose and Health Impact of the Accident at the Three Mile Island Nuclear Station" (NUREG-0558) for your further information.

I appreciate your concerns and assure you that every effort is being made to ensure the continued protection of the health and safety of the public, not only at Three Mile Island, but also at all nuclear power plants.

Sincerely,



Bernard J. Snyder, Program Director  
Three Mile Island Program Office  
Office of Nuclear Reactor Regulation

- Enclosures:
1. NUREG-0662, vols. 1 & 2
  2. Order for Temporary Modification of License of June 12, 1980
  3. Memorandum and Order of June 12, 1980
  4. PEIS
  5. Summary of NUREG-0558