



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

JUL 8 1979

Ms. Diann M. Gleason
Mr. Lawrence Singer
1133 Adams Drive
Warren, Michigan 48093

Dear Ms. Gleason and Mr. Singer:

I am writing in response to your letter to Mr. R. C. Seaman, Jr., regarding information on the accident at the Three Mile Island nuclear station. I shall respond to the queries listed in your questionnaire. I regret that this answer to your letter 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.

Regarding the possibility of an explosion in the Three Mile Island reactor vessel, for a few days after the accident at TMI, there was some concern that a hydrogen bubble in the reactor vessel might react explosively with the oxygen thought to be slowly accumulating in the bubble. There was concern that such a chemical explosion might break the reactor vessel or breach the containment building and possibly allow the escape of large amounts of radioactive materials. However, after extensive investigation and consultation with outside experts, NRC concluded that such an explosion could not occur because essentially no oxygen could have accumulated in the bubble under the existing conditions. Therefore, it is not correct to state that the plant was going to blow up.

The accident was due to both human and mechanical errors, coupled with reactor design problems. Enclosed is a copy of the summary of "Investigation into the March 28, 1979, Three Mile Island Accident by the Office of Inspection and Enforcement" (NUREG-0600), which outlines the events that occurred during the accident. Also enclosed is a copy of "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations" (NUREG-0578), which suggests various technical alterations to help prevent future accidents at pressurized water reactors and boiling water reactors.

No accident of this type and magnitude had occurred in a commercial power plant in the United States prior to the accident at TMI-2 on March 28, 1979.

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For learning the effects of radiation, you may be interested in obtaining a copy of the booklet "Living with Radiation" (ERDA-76/89) from:

National Technical Information Center
5285 Port Royal Road
Springfield, Virginia 22161

This publication gives a general explanation of the effects of radiation.

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 Three Mile Island 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, Pennsylvania, area receive is approximately 125 millirems per year. To put these doses into perspective, it should be noted that a traveler flying round trip in a jet between New York City and Los Angeles receives 5 millirems from cosmic rays in the natural background. Information in the summary to NUREG-0600 will give you an indication of the radiation levels on Three Mile Island during the accident. Since that time these levels have decreased.

The warning systems and their effectiveness are discussed in both NUREG-0600 and NUREG-0578. Nuclear power plants undergo the rigorous testing procedures outlined in the U.S. Regulatory Guides, Series 1, before they are allowed to produce electricity.

The former Atomic Energy Commission (AEC) had a Congressional mandate to develop and promote nuclear energy. When the AEC was abolished in 1974, the NRC was created by Congress for the sole purpose of regulating the commercial production of nuclear energy. The U.S. Department of Energy is now responsible for the Federal Government's nuclear research and development activities. Consequently, questions about the future of this energy source should be directed to that agency.

With respect to alternative methods of energy production, such as solar, wind, and geothermal, the Department of Energy is the federal agency responsible for their research and development. The NRC considers these alternative methods of energy production in its assessment of the environmental impact of each

Ms. Gleason and Mr. Singer

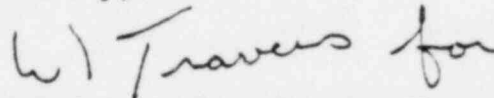
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nuclear power plant as part of the agency's overall review of each utility's application for a construction permit or an operating license. To date, we have determined that alternative methods of energy production are neither technically nor economically feasible to provide the required amount of power at the time it is needed.

I am pleased to provide you with this information.

Sincerely,

A handwritten signature in cursive script that reads "W J Snyder for".

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

Enclosures: 1. Summary of NUREG-0600
2. First part of NUREG-0578

11523 Adams Drive
Warren, MI 48093
May 14, 1979

~~Robert C. Seaman Jr.~~
Administrator
Energy Research & Development Administration
20 Massachusetts Ave.
N.W. 20545

Dear Mr. Seaman:

We are looking for information concerning the Three Mile Island accident and other nuclear mishaps. We would appreciate it if you would complete the enclosed questionnaire to the best of your knowledge and return it to us as soon as possible.

Thank you for taking the time to complete our inquiry. Any further comments would be more than welcome.

Sincerely,

Diann M. Gleason
Diann M. Gleason

Lawrence Singer
Lawrence Singer

enclosures

Nuclear Power Plant Questionnaire

- 1. Please fill out the following questionnaire to the best of your ability.
- 2. Further comments would be appreciated.
- 3. All information submitted will be kept confidential.



1. What would have happened if the bubble in the Three Mile Island plant had exploded?

5

2. Was the three mile Island accident due to human or mechanical error?

3. How could the accident have been prevented?

if HPI had been kept on

4. Have there been other such accidents in the United States?

no

5. Are people near A-plants aware of the dangers?

6. What effect does radiation have on people?

Living with Risk ERDA-76/29

7. Was there a tolerable level of radiation on Three Mile Island after the accident occurred?

50-67

8. How effective are the warning systems on an A-plant?

9. Should we continue our A-plant building program?

51-75

10. Are nuclear power plants adequately checked out before they are put into operation?

Annual report enclosed (by NRC)

11. Is there any other energy alternative for the future other than nuclear power?

SP-6

Comments: