



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

SEP 07 1984

MEMORANDUM FOR: Chairman Palladino  
Commissioner Roberts  
Commissioner Asselstine  
Commissioner Bernthal  
Commissioner Zech

FROM: William J. Dircks  
Executive Director for Operations

SUBJECT: STAFF ACTIONS FROM THE AUGUST 15, 1984  
COMMISSION MEETING ON TMI-1 (M840815)

PURPOSE: To respond to Secretary Chilk's August 27, 1984 Staff  
Requirements Memorandum (M840815) regarding the  
radiological concerns raised by the Aamodts at the  
August 15, 1984 Commission meeting.

DISCUSSION: Secretary Chilk's August 27, 1984 memorandum requests that  
the Staff prepare a response to six concerns raised by the  
Aamodts during the August 15, 1984 Commission meeting.  
These concerns pertain to effects on human health and plant  
life following the TMI accident from radiation levels in  
the TMI area which allegedly were much higher than reported  
at the time of the 1979 accident, and to subsequent coverup  
of these radiation levels by the licensee, the NRC, and  
others. The Staff responded to some of these concerns in  
the August 31, 1984 memo from W. Dircks to the Commissioners.  
The Staff's responses to the remaining concerns appear in  
Enclosure (1) to this memo.

The NRC staff has examined the Aamodt Report and finds that  
the survey was not scientifically conducted. Nevertheless,  
the Staff has looked beyond the scientific quality of the  
survey to see if it contains a body of information that  
would warrant further investigation; we see no such new  
information. Recognizing that the objectivity of the NRC

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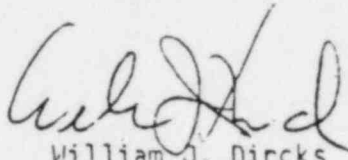
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The Chairman and  
Commissioners

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is being challenged here, the Staff prepared a letter to the Centers for Disease Control, which was forwarded with the August 31, 1984, memorandum, to seek an independent opinion.



William J. Dircks  
Executive Director for Operations

Enclosures:

1. Staff Responses to Aamodt Concerns
2. Sept. 20, 1979 Letter fm Denton to Reed

cc: w/enclosures  
OPE  
OGC  
SECY

Staff's Responses to Aamodt Concerns

Listed below are the Staff's responses to the six items (underscored below) addressed in Secretary Chilk's memorandum of August 27, 1984.

1. Botanical data on plant abnormalities which, the Aamodt's believe, suggest that the plants were exposed to radioactive fallout.

Surveys performed by the Pennsylvania Department of Agriculture after the accident at Three Mile Island, Unit 2, have failed to detect any unusual vegetation effects which could be attributed to airborne radioactive contamination resulting from the accident. After analyzing 187 plant specimens submitted from Dauphin, Lancaster, and York Counties for 1978 and 1979, the Pennsylvania State Plant Disease Clinic found that the damage to 90% (168 specimens) of the specimens was attributable to normal biological or environmental factors. Three percent (6 specimens) were inadequate to analyze, and the causal agent of the problems for the remaining 7% (13 specimens) could not be specifically identified. These and other findings of an NRC investigation of reported plant abnormalities in the TMI Area are documented in NUREG-0738, Investigations of Reported Plant and Animal Health Effects in the Area of Three Mile Island. This report found that "all vegetation stress was attributable to natural causes."

2. Health related effects data which, the Aamodt's believe, suggest that people in the area of TMI were exposed to radiation levels higher than reported at the time of the 1979 accident.

The Staff has prepared a summary of the scope and principal findings from the more significant studies performed on potential health effects

resulting from the Three Mile Island, Unit 2, accident. This summary (see Enclosure (2) of the August 31, 1984 memo from W. Dircks to the Commissioners) includes information on the maximum radiation releases and estimated radiation doses to the population living within a 50 mile radius of the Three Mile Island Nuclear Plant. Contrary to the Aamodt's conclusions, this summary indicates no health effects directly attributable to the radiation from TMI.

3. Action taken by NRC in response to the August 8, 1979 letter from Pennsylvania State Representative Steven Reed to then-Chairman Joseph M. Hendrie.

Enclosure (2) to this memo is a copy of a letter dated September 20, 1979 from Harold Denton, Director, Office of Nuclear Reactor Regulation, to Pennsylvania State Representative Steven Reed. This letter is in response to the August 8, 1979 letter from Representative Steven Reed to then-Chairman Joseph M. Hendrie, and indicated the symptoms discussed were not possibly due to radiation exposure experienced from the TMI accident. In fact, they were somatic symptoms of psychological stress experienced by people in the vicinity of TMI, post-accident. This psychological stress is one of the most widely studied aspects of the TMI crisis, and its effects have been reported and discussed widely in the medical literature.

4. Any group or organization presently performing an epidemiological study of persons who lived near TMI at the time of the accident in March 1979.

Shortly after the Three Mile Island, Unit 2, accident, the Governor of Pennsylvania designated the Bureau of Health Research of the Pennsylvania Department of Health to coordinate and manage all health-related research activities relative to Three Mile Island. At the same time, a special Advisory Panel was commissioned by the Secretary of Health to oversee and guide all Three Mile Island-related health studies administered by the Bureau of Health Research. Some of the studies which have been or are currently being conducted in this area are:

- TMI Census
- Pregnancy Outcome Study
- Congenital/Neonatal Hypothyroidism Study
- Radiation Dose Assessment Study
- Health Behavioral (Stress) Study
- Mental Health Study
- Infant Mortality Study
- Health Economics Study
- Mobility Study

Findings from the completed studies on congenital/neonatal hypothyroidism and infant mortality (Tokuhata, G., "Impact of TMI Nuclear Accident Upon Pregnancy Outcome, Congenital Hypothyroidism and Infant Mortality," chapter prepared for Energy, Environment and the Economy published by the Pennsylvania Academy of Science, 1981) have shown that the Three Mile Island nuclear accident was not responsible for the reported cases of congenital hypothyroidism, nor did the accident have any demonstrable impact on infant mortality in the TMI Area.

In addition to these studies, the TMI Advisory Panel and the Secretary of Health have recently approved a program to establish an Epidemiologic Surveillance System (Tokuhata, G., "Epidemiologic Surveillance in Pennsylvania: A Case of Nuclear Power Plants," Pennsylvania Department of Health, June 1984). The objectives of this system are to develop and implement a baseline health information system for the population residing within 20 mile radii of the six nuclear power plants in Pennsylvania, and for selected control areas.

As part of the settlement of a 1981 federal class-action lawsuit against the owners of Three Mile Island, 5 million dollars was set aside to establish a TMI Public Health Fund. The objectives of this fund are to study the health consequences of the TMI accident and particularly of the effects of low-level radiation on people.

5. A list of the scientific studies of probable exposures and health effects resulting from the 1979 accident.

The Staff has compiled a comprehensive bibliography of the studies and surveys that have been performed regarding radiological impacts of the Three Mile Island, Unit 2, accident. This bibliography, arranged in chronological order, was provided as Enclosure (1) of the August 31, 1984 memo from W. Dircks to the Commissioners.



6. The usefulness of requesting the Centers for Disease Control (CDC) in Atlanta to conduct an epidemiological study to determine if there are health effects that can be attributed to the radiation released during the TMI-2 accident.

The Staff has previously investigated the feasibility of conducting epidemiological studies on large population groups. Soon after the TMI accident, the Staff initiated a contract (with Health Systems Division, Equifax, Inc., Reading, MA) to: 1) study the strengths and constraints in conducting epidemiologic studies of subjects with low-level ionizing radiation exposure; and 2) to examine the merit of conducting such studies. The findings of this study are contained in NUREG/CR-1728, The Feasibility of Epidemiologic Investigations of the Health Effects of Low-Level Ionizing Radiation. This study considered investigations of several large population groups (including workers in health services, nuclear power plants (including the TMI worker population), Department of Energy-supported facilities or nuclear shipyards, and people who received routine pre- or postnatal radiological examinations). The conclusions of the study were that:

"no out-standing candidate population is available--one that presumably could be used to define with reasonable accuracy the low-level radiation-induced risk of cancer. Even if the largest of the candidate populations were studied, the probability of detecting a statistically significant result would be very small (<60%). Therefore, the decision whether to conduct a study must rest heavily on social and political

considerations rather than on scientific ones. It may be worth 15 or 25 million dollars to demonstrate that the health effects are so small that they cannot be measured, and that on this basis the present regulatory standards are adequate."

The NRC staff has examined the Aamodt Report and finds that the survey was not scientifically conducted. Nevertheless, the Staff has looked beyond the scientific quality of the survey to see if it contains a body of information that would warrant further investigation; we see no such new information. Recognizing that the objectivity of the NRC is being challenged here, the Staff prepared a letter to the Centers for Disease Control, which was forwarded with the August 31, 1984, memorandum, to seek an independent opinion. The Staff will review the findings of the CDC and make a decision at that time as to whether further epidemiological studies of the TMI Area population are warranted.