THE THREE MILE ISLAND PUBLIC HEALTH FUND

The First Two Years: A Report to the Court and the Public

Three Mile Island
Public Health Fund
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Introduction

The Three Mile Island Public Health Fund ("TMI Public Health Fund" or "Fund") was created as a result of the settlement of litigation surrounding the accident at the TMI nuclear facility in March of 1979. The settlement, which included a resolution of certain economic loss claims and the creation of an economic loss fund out of which such claims could be paid, provided for the establishment of a $5 million Public Health Fund to address public health issues of research and education in an effort to resolve outstanding questions concerning the accident and to render other accidents at TMI less likely. The Fund is under the supervision of the Honorable Sylvia H. Rambo, United States District Judge for the Middle District of Pennsylvania.

This report is a continuation of a series of meetings and reviews for the Court and the public. The first section describes the Public Health Fund as established in November, 1981.*/ The second section summarizes the experience of the administrators and advisors charged with the development of funding and research agenda. The third sec-

*/ The Stipulation and Agreement of Settlement ("Settlement Agreement") was entered into as of February 17, 1981 and became effective on November 9, 1981 when the settlement became final.

tion concludes the report with a proposed spending plan, as presently advised, and a summary of disbursements of the Fund through May, 1984.

I.
WHAT IS THE THREE MILE ISLAND PUBLIC HEALTH FUND

The Mandate

The Public Health Fund is a fund of $5 million set up for the benefit of those people living or working within twenty-five miles of the damaged reactor.*/ The purpose of the Fund is to finance research into public health questions that arise from the Three Mile Island accident and its aftermath and to address certain other subjects relating to future activities at the facility.

Under its charter (called the Settlement Agreement), the Fund has a broad mandate to support research and make expenditures on five subjects: improved radiation monitoring; human cancer risk estimates due to exposure to low

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*/ Since the Fund is a result of litigation between parties under the supervision of the United States District Court, it is in the nature of a trust established for the benefit of persons living and residing in the area within 25 miles of the facility as to which the Court is the exclusive trustee. For the purpose of administration, the administrators of the Fund and scientific advisors are agents of the trustee.

level ionizing radiation; assessments of the accident and its radiological and non-radiological health effects; improved emergency planning at TMI; and public education and information designed to provide credible and authoritative assessments so that members of the general public living in and around TMI and the scientific and regulatory communities can develop their own informed opinions about the health impacts and public policy implications of the accident.

These purposes are explicitly stated in the Settlement Agreement approved by the Court in Paragraph 10:

10. The Public Health Fund shall be used for any of the following purposes:

> (a) improving the monitoring of radiation releases from TMI through
>
> (i) funding the purchase of equipment by, or
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> (ii) funding existing programs presently being engaged in by, or
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> (iii) funding new programs by the Commonwealth of Pennsylvania, the Environmental Protection Agency, the Nuclear Regulatory Commission or the Department of Energy, or any successors thereto or other government entity engaging or which will engage in radiation release monitoring at TMI.
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> (b) funding of studies or analyses relating to the possible health related effects (and related studies and analyses) resulting from the TMI Accident and related events and approved, now or hereafter, by the TMI Advisory Board on Health Research Studies established by the Governor of the

Commonwealth of Pennsylvania ("Advisory Panel") or any other state or federal governmental body or accredited educational institution of higher learning; provided that, in order to satisfy any requirement of approval imposed by this subparagraph, plaintiffs' liaison counsel may propose studies to any entity referred to in this subparagraph on their own initiative and without reference to whether such entity is presently engaged in studies of health related effects of the TMI Accident;

(c) funding of public education programs involving the general public residing or working within twenty-five miles of TMI or the medical community within or serving that region on the subjects of (i) cancer and early detection of cancer generally and the health effect of radiation; (ii) procedures to be followed in the event of the necessity to evacuate in the future the area within twenty-five miles of TMI or any part thereof; or (iii) public education of any other nature to reduce stress;

(d) funding the preparation of or the means to implement or assist in implement a comprehensive plan of evacuation or emergency assistance of any population within twenty-five miles of the TMI facility, if necessary; and

(e) funding general research into the effects of low level radiation on human health and related studies and analyses.

Administration Of The Fund

Under the Settlement Agreement, Judge Rambo, approves every expenditure from the Fund. David Berger Esq. of David Berger, Attorneys-At-Law, Philadelphia, Pa., the plaintiffs' chief trial counsel during the litigation and

plaintiffs' liaison counsel, is the adminstrator of the Fund and reports to Judge Rambo.

To advise the Court on public health questions arising from Settlement Agreement and on policy and expenditures, the Fund has established a board of scientific and medical advisors. Currently these include:

Dr. Karl Z. Morgan, Chairman, Former Director, Health Physics Division, Oak Ridge National Laboratory

Dr. Edward P. Radford, Chairman of the National Academy of Sciences Committee Impanelled to Investigate the Biological Effects of Ionizing Radiation (BEIR)

Dr. H. Jack Geiger, Program Director of Community Health and Social Medicine, Sophie Davis School of Biomedical Education, City University of New York

Professor Dean Abrahamson, Director, Hubert H. Humphrey Institute of Public Affairs, University of Minnesota;

Dr. John Cobb, Professor, Department of Preventive Medicine & Biometrics, University of Colorado School of Medicine

Dr. Thomas Cochran, Senior Research Scientist, Natural Resources Defense Council, Inc.

Professor Ian McHarg, Chairman, Department of Landscape Architecture and Regional Planning, University of Pennsylvania

Dr. George M. Woodwell, Director, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA; Chairman of the World Wildlife Foundation

The advisors' principal role is to broaden the scope of the inquiry and bring to bear world-wide technical and intellectual resources to the research topics defined by the Settlement Agreement. The advisors are not responsible for the actions of the Fund but advise the Court.*/

The Settlement Agreement also provides for an independent scientific advisor. Currently Dr. Baruch Blumberg holds this position. He is responsible for the review of funding proposals on the subjects of the health effects of the accident and general research into the human health effects of low level ionizing radiation. The Agreement states:

> 11(b) Any petition for approval of a funding proposal under subparagraphs 10(a), 10(c), or 10(d) shall contain sufficient information to enable the Court to determine whether the proposal will advance the purpose of the applicable subparagraph, and shall reflect the opinion of the government entity or other organization involved. Any

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*/As noted, the Fund is similar to a trust of which the United States District Court is Trustee.

> petition for approval of a funding proposal under subparagraph 10(b) involving a study or analysis approved by the Advisory Panel shall be deemed to advance the purpose of such subparagraph. Any petition for approval of a funding proposal under subparagraph 10(e) or under subparagraph 10(b) (other than a study or analysis approved by the Advisory Panel) shall either reflect the concurrence of counsel for the Pools or the concurrence of the Scientific Advisor referred to in subparagraph 11(c) below. The determination of the Scientific Advisor under subparagraph 11(c) shall be binding upon counsel for the parties.

The important role of the Independent Scientific Advisor is to rule on the scientific merit of proposals on the controversal subjects of the health effects of the accident and the general study of the health effects of low level ionizing radiation.

Citizens and interested members of world scientific community also play a role in the administration of the Fund. They can file petitions with the Court, they can send letters and proposals to the Court, to the advisors and the administrators. The Court forwards all questions and comments to the administrator of the Fund for advice and comment. With approval of the Court, the administrator has held a variety of public meetings to provide information and develop research and funding agenda. To date these include:

a three day forum in March of 1983 held in Middletown, Pa., an evening meeting in December, 1983 to review public comments on a petition to the Court for funding to develop an improved radiation monitoring system held in Middletown, Pa., a weekend afternoon conference*/ on the health effects of the accident held in March of 1984 in Middletown, and a June, 1984 technical workshop on the physco-social impacts of the accident in Philadelphia, which was attended by local TMI and other scientists and interested persons.

Court approval is necessary for all disbursements from the Fund. It is the responsibility of the administrator, with the advice of the advisors to present petitions for these expenditures to the Court and, if necessary, to the Independent Scientific Advisor. Prior to final approval, the Court receives comments on the petitions from all interested parties, including the public and directs the administrators to respond to these comments. With final approval by the Court, the administrators enter into contracts with

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*/ The Fund provided financial assistance, but did not sponsor this conference.

the consulting scientists. The public review of each petition and the necessity of response and modifications makes for an extended, thorough and deliberate approval process.

The preparation of petitions to support research is also thorough. The administrator and advisors attempt to find the best possible people to perform the research. They use a combination of public requests for proposals distributed through the most important scientific journals and peer recommendations to contact and select appropriate consultants. Technical expertise and integrity, as well as the need of the Court, public, and scientific community to achieve an objective, balanced perspective on the objectives of the Settlement Agreement are criteria used to select consultants. The administrator and advisors evaluate unsolicited proposals in the same way, but with the additional criterion of relevance to the objectives of the Settlement Agreement.

Although the Fund has a broad mandate to study the health effects of low level ionizing radiation and aspects of education and emergency planning, the advisors and administrator must judge all unsolicited proposals from this view

of relevance to the TMI accident and the TMI population as well as on their scientific and technical merit. In recent years, there have been government cutbacks on important health and safety related radiation research. The Fund cannot support all or many of these projects. Only those which the Court, and the advisors and consultants, working with the Court, deem relevant will receive consideration.

II.
ACTIVITIES OF THE FUND UNDER THE SETTLEMENT AGREEMENT

An Overview

The administrator of the Fund regards the monies of the Fund as precious dollars. In the United States alone, hundreds of millions are spent each year by industry and government in the many research fields associated with nuclear power. The Fund does not wish to duplicate work done by others or to spend money on projects that are the legitimate concern and duty of other organizations. It does desire to support projects that answer questions about the health effects of the accident, that simultaneously advance the understanding of the impact of low level ionizing radiation on human health and that address certain problems stemming from the clean-up and possible future operations of the facility, specifically radiation monitoring and emergency

planning. The Public Health Fund provides an opportunity to investigate these questions in a comprehensive way, free from the constraints imposed by government, industry, or university sources of funding.

The Fund views the research topics as interelated. The interelationship exists on two levels. First, to a great extent, there is an overlap of subject matter. For example, there is a close, if not symbiotic, relationship between emergency planning and monitoring. During certain potential accident situations, detection of radiation in the environment surrounding the plant will be critical to health risk assessments required to evaluate the applicability of emergency measures and may act as a trigger to the decision to evacuate.*/ Similarly, determination of the health effects of the accident may be influenced by research that the Fund conducts on the general effects of low level radiation.**/

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*/ The Fund has presently commissioned a major program on the subject of radiation monitoring. The Fund is also not unmindful that certain accident scenarios can develop so rapidly that even the most up-to-date and state-of-the-art monitoring would not be useful for decisions relating to emergency measures. The Fund has nearly completed a proposal to investigate these, and other, problems relating to emergency preparedness.

**/ Subject matter relevance of one research topic to another transcends the general. The Fund has found a specific [FOOTNOTE CONTINUED ON NEXT PAGE]

Second, since the size of the Fund is limited in nature, not every worthy program under each subject matter category can be supported. Thus, it is necessary to prioritize funding options within a specific category and between categories. This problem is magnified by the fact that certain categories of funding (i.e. radiation monitoring, emergency planning etc.) or even specific programs within a specific category could, practically speaking, exhaust all, or substantially all, the resources of the Fund.

The Fund is hopeful that, taken together, all the research on these topics will help provide the citizens of the TMI region and the scientific, industrial and regulatory communities with improved assessments of the health impacts and policy implications of the TMI accident and useful information and action on selected problems relating to the clean-up and possible future operations or the plant, if any. These data will be the basis of a public information program of the Fund that will attempt to provide all inter-

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[FOOTNOTE CONTINUED FROM PREVIOUS PAGE]

overlap of subjects relating to the peculiar factual circumstances at TMI. For example, a review of the published literature on radiation release resulting from the accident has already yielded insights into future emergency planning and radiation monitoring at TMI and suggests that further research on the subject will yield additional insight.

ested parties with credible and authoritative information upon which to make their own decisions about these important issues.

RESEARCH PRIORITIES

The Development Of A Design For An Improved And Credible Monitoring System

There is a direct relationship between accurate, and credible radiation monitoring and the safe operation of reactors. Well known studies of the TMI accident have, with hind sight, questioned the adequacy of certain technical specifications of the radiation monitoring system in existence at the time of the accident, such as the number, placement and performance of monitoring devices. The accident also appeared to reveal many weaknesses in the collection, coordination, and communication of the available monitoring data. Moreover, the Fund has concluded that the issue of the detection of small, low level releases that warn of possible future reactor problems, as well as the tracking of larger radiation releases which might result from an accident, warrants substantial attention.

Table 1, "Important Considerations For A Comprehensive Radiation Monitoring Design" summarizes the current

research goals of the Fund as established by a program, as approved by the Court to develop a design for improved monitoring, the principal investigator of which is Dr. Ruth Patrick, Academy of National Sciences, Philadelphia. Details of the program, as approved by the Court, are available in documents filed of record and publically available with the Clerk of the Court, Harrisburg, Pa.

Table 1
Important Considerations For A Comprehensive Radiation Monitoring Design

1. Dose Estimates: a comparative study of methods of estimating the dose expressed in person rem to the maximally exposed individual, and to various subgroups of the population.

2. In-Plant Monitoring: the development of methods that work under emergency conditions to track the source of effluents, the chemical composition and physical state of releases, and the impact on personnel and other safety and monitoring systems.

3. Comprehensiveness: the development of methods with the capability to measure peak levels at frequent intervals (so-called "on line real time monitoring"), cumulative amounts of effluents, and to detect, identify and measure levels of significant radioactive materials that might be released either routinely or under accident conditions from all known leak pathways.

4. Waste Monitoring: the comparison of the effectiveness and costs of varied programs to control the management radioactive waste during storage and transport.

5. Off-Site Monitoring: the consideration of continuous recording devices, cummulative dose monitoring systems and biological monitoring systems to provide pertinent data on the exposure of people in nearby communities.

6. Communication of Data: the development methods to rapidly retrieve off-site monitoring data and make it available for decisions regarding the protection of public health.

7. Biological Systems: the use of biological indicators for dose and biological effect assessement; a comparative study of various approaches to tracking the migration of radionuclides through ecosystems to humans.

8. Regulatory Requirement: inventory and compare US and foreign requirements; compare with findings of all the technical studies.

9. Public Credibility: develop recommendations to produce a publically credible monitoring process.

10. Citizens Involvement: develop a check and balance system of information to complement the current "top down approaches."

New Research And Reanalysis Of The Radiological and Non-Radiological Health Effects Of The Accident

Radiological Health Effects

The inquiry into the radiation health effect of the TMI accident has two areas of concentration: (1) TMI regional analyses and (2) the investigation of the generic issue of the human health effects of low level ionizing radiation. The former includes review and analysis of the published scientific literature on the subject of the accident radiation releases to provide a basis for further research, a review of potential local study populations and investigation of smell and taste sensations reported at the time of the accident.

As to the latter dimension of study of radiological effects, the Fund has developed a 2 phase research strategy. In Phase I, the Fund commissioned a literature survey of the published scientific literature on the health effects of low level radiation on humans. That study is now complete and has been submitted to the Fund for transmittal to the Court. Also in Phase I the Fund intends to commission a program to rank potential study populations which hold the most promise of scientific study. In Phase II, the Fund will commission research of one or more of the study populations identified in Phase I. The Fund is hopeful that this

research program will assist in the on-going development, both in the scientific community in the United States and abroad, of predictive models of radiation dose and human cancer response.

TMI Regional Studies

The Fund has commissioned a major review of the published literature on the subject of the radiation release due to the TMI accident, known as the accident dose assessment. This review was conducted by Dr. Jan Beyea, Senior Energy Scientist of the National Audibon Society and has now been completed and submitted to the Fund for transmittal to the Court. The study covers all the assessments of radiation releases at TMI found in the published scientific and engineering literature (400 papers and 4 major studies), analyzes these assessments, and proposes research projects to address uncertainties and open questions in the literature of the TMI accident does assessment.

The subjects covered by the review include a description of the scientific literature on TMI dose assessment; doses received at TMI from noble gases, radioiodine, and radiocesium, an analysis of open questions and uncertainties in the scientific literature on TMI releases and recommendations for possible future research.

The Fund is recommending to the Court that a major scientific conference be convened to discuss the findings of the TMI dose assessment review. Researchers in the field, as well as interested persons from the TMI area, will be invited to attend the conference. Based upon the outcome of the conference and further deliberation, the Fund will make recommendations to the Court on the subject of further research. The conference is tenatively scheduled for the fall of 1984.

Unless research provides better estimates of the TMI accident dose, it will remain difficult to add insight into the radiological effects directly attributable to the TMI accident as presently described in the scientific literature. However, funded research of the type suggested by the TMI accident dose assessment review will enhance the interpretation of the Pennsylvania Department of Health's 1984, and 1994 follow-up studies of the TMI population.

Other TMI regional investigations under current evaluation by the Fund's advisors include proposals to study for adverse effects of the sub-population of children con-

ceived at the time of the accident and an investigation of the self-reported symptons of smell and taste associated with the accident.

The Development Of Predictive Models

A three step process is in motion to bring the world-wide experience with radiation to bear on the TMI problem of predicting the health effects of the accident. The process entails a literature up-date, followed by a review of study populations, followed by funded research to develop better estimates of the number of cancers caused by a given exposure to low-level ionizing radiation.

A commissioned literature survey which has recently been completed entitled "A Review of the Carcionogenic Effects of Low-Level Ionizing Radiation", authored by Dr. Daniel A Hoffman, Senior Epidemiologist, National Cancer Institute and Dr. Edward P. Radford, a science advisor to the Fund, provides a current (within the last two years) and concise update of scientific developments on the subject of radiation effects in humans.

The review includes information on current theories of carcinogenesis, the role of cell mutations and transforma-

tions in the induction of cancer, current concepts of initiation and promotion, various aspects of dose-response, both at the cellular and epidemiologic level, the role of host factors in modifying cancer induction rates, and a current update on the major epidemiologic studies. It discusses what the scientific community has and has not learned from these studies as regards the effects of ionizing radiation exposure on human cancer, and proposes direction for future studies.

In March 1984, concurrent with this review, the science advisors of the Fund selected two research teams to rank populations for suitability to study the human health effects of low level ionizing radiation. The Fund is currently searching for a third group and is in the process of securing approval of its Phase I program, the full details of which will shortly be made public for the review of interested persons. In the late fall or winter of 1984, the Fund proposes to sponsor a conference for scientists and citizens to discuss the rankings and make recommendations for study. In the second phase of this effort the advisors will recommend support for a variety of population studies.

This research, it is hoped, will assist in improving estimates of the risk of cancer associated with exposure to ionizing radiation. Such estimates of the expected incidence of cancer and of cancer mortality per unit radiation dose are called cancer risk coefficients. Currently the Nuclear Regulatory Commission and health standard setting bodies apply an estimate of one fatal cancer per ten thousand person rem of exposure, while certain reasonable interpretations of other data, including the Japanese bomb survivor cancer registry, suggest greater risk estimates, some of which are on the order of magniture of one fatal cancer per thousand person rem. Funded research may be able to assist in sharping existing estimates.

Information about the risk of cancer incidence, when combined with revised estimates of the actual amount of radioactive gases released in the Three Mile Island accident, may make it possible to improve assessments the radiological health effects of the accident.

Non-Radiological Health Effects

There is evidence that a significant proportion of the TMI population suffers from adverse psychological effects of the accident, including such things as a fear of

radiation, a fear the contaminated facility releasing its radiation into the environment and a fear of the restart of the undamaged reactor at the facility. The Fund is considering further study and documentation of the prevalence of adverse psychological effects of the accident and events at TMI in its aftermath and exploring whether meaningful programs can be formulated under the Settlement Agreement which are designed to deal with TMI induced psychological trauma.

Whether or not the undamaged reactor is restarted, the psychological effects or the TMI accident will continue to affect many people. The disability from TMI related fear may be as important as, or even greater, than the health effects of radiation exposure from the accident itself. In June, 1984, the Fund sponsored a technical workshop for local TMI scientists and nationally known experts to discuss the problem and a funding agenda for the investigation of non-radiological health effects.

Public Education And Information

It is the continuing policy of the Fund to provide the TMI community and other interested persons, with authoritative non-biased assessments and information. Such persons should receive information in a timely way, and in a

readable, and unbiased form so that they can make up their own minds as to the credibility of the information. Accord Associates of Boulder Colorado, in cooperation with many interested individuals in the TMI region, has provided a variety of suggestions to develop a continuing education program. Table 2, "TMI Residents' Public Information Program Recommendations", summarizes these perceptions.

Table 2
TMI Residents' Public
Information Program Recommendations

Local Clearinghouse. A local clearinghouse could provide a single and central location for citizens to obtain accurate information about the Fund's activities. Clearinghouse coordinators could answer questions about upcoming meetings, the status of studies and other questions of interest. The clearinghouse could also become a repository of information generated by the Fund where people can come to read PHF documents.

Project Reports. Regular progress reports should be written and conveyed to interested organizations in the community. A local coordinator could take responsibility for contacting the appropriate scientists each month to gather information for an update.

Advisory Committee. An advisory committee comprised of broad representation from the community could oversee the activities of the information clearinghouse and provide a sounding board for the consulting scientists, Technical Advisory Committee and the Fund lawyers.

Topical Committees and Programs. Topical committes and programs may be created to work with specific fund studies and projects. Depending on the topic, public meetings open to all citizens or a selected group of individuals may work with the scientist to describe concerns and issues related to a study considered to be of importance to the citizens, review methodology, monitor the progress of studies and discuss the results.

In March, 1984 the Fund funded (but did not sponsor) a conference on health effects of the TMI accident. This effort represented a cooperative effort between local citizens, the Health Issues Committee of TMI Public Interest Resource Center, local scientists, the Commonwealth of Pennsylvania Department of Health, the continuing education

program of the, Capitol Campus of the Pennsylvania State University, and the Public Health Fund to develop an ongoing public information program. At the meeting scientists with divergent methods and conclusions about the health effects of the accident discussed their differences and answered questions from the public. The participants look forward to future meetings in preparation for a major conference on health effects, in 1986 or 1987.

Research On The Assumptions And Requirements Of Emergency Planning

Under provisions of the Settlement Agreement, the Fund is authorized to make expenditures in the "preparation" of or "assist[ing] in the implement[ation] of" emergency plans for TMI. After due consideration by the scientific advisors to the Fund, the Fund believes that its most constructive role with respect to assisting in the preparation and implementation of TMI emergency plans would be to support specific technical studies, reviews and evaluations of current emergency plans and by investigating the basic underlying assumptions of emergency planning at TMI. The Fund has concluded that it should attempt to concentrate on subjects of a technical, scientific nature since it can bring expertise to bear that otherwise would not be available to local and regional authorities. It should probably not

strive to duplicate work or tasks of others who are either more qualified or have specific responsibilities.

With these principles in mind, the Fund initiated a preliminary review of the subject of emergency planning generally. Pursuant to this review, the Fund identified eight important emergency planning concerns consisting of the following: (1) health risk assessment; (2) the basis for the decision to evacate; (3) the extent of the emergency planning zone; (4) contamination and medical services; (5) transportation planning; (6) re-entry; (7) behavior under stress; and (8) public awareness.

The Fund further determined that, at least, three subjects, that is (1) health risk assessment; (2) basis for the decision to evacuate; and (3) the extent of the emergency planning zone, involve certain estimates of a considerable technical and scientific nature relating to the extent, magnitude and geographical scope of hypothetical radiation releases from a range of severe nuclear plant accidents.

In this light, the Fund presently believes that the current assumptions of TMI emergency planning relating to the timing and releases of radioactive material in hypo-

thetical accident situations are of critical importance to emergency preparedness at the facility. The Fund is in the process of preparing a petition to the Court which will be filed with the Clerk and circulated publicly addressing this aspect of the TMI emergency plan.

III.
PROPOSED SPENDING PLAN AND SUMMARY OF DISBURSEMENTS

As of May, 1984 the Fund amounted to approximately $6,600,000.

Disbursements As Of May, 1984

Since November, 1981, when the Fund went into existence, the Fund has disbursed $451,992. Of this amount, approximately $226,610 has been expended on projects and other activities. The Fund has paid general scientific consultants not directly attributable to specific programs $222,062. For a more completely statement of disbursements, see Appendix "A" which accompanies this report. Neither the administrator no Counsel to the Fund which, under Court supervision, is responsible for the day-to-day administration of the Fund has as yet received any compensation for services in connection with the administration of the Fund.

Every expenditure of the Fund in subject to Court approval and is a matter of public record filed with the Clerk of the Court, in Harrisburg, Pa.

A Proposed Spending Plan

The proposed spending plan which is set forth below takes into account the following factors: (1) the interrelatedness of the objectives of the Fund; (2) their importance as presently perceived by the science advisors to the Fund based upon their view of balancing the actual need to act on a particular matter, the need to act as perceived by the community (to the extent it diverges from the present state of scientific fact), and the practical possibilities of benefits from proposed actions; and (3) the need for prioritization among possible proposed actions both as to individual objectives of the Fund and as between objectives.

The proposed overall spending plan has been based upon considerable deliberation and represents the best judgment of the Fund's science advisors at this time and is subject to change in the light of shifting circumstances, including the outcomes of ongoing programs of the Fund.

For purpose of analysis, the Fund is assumed to consist of $7 million. (As of May 1984, the Fund amounted

to $6,600,000.) Proposed spending committments are expressed as a range, in percentages of the total fund. Tentative spending priorities are assigned to each objective and specific projects (actual and proposed) are listed by objective.

	Range	
Improved Radiation Monitoring	10-15%	
Monitoring program */	8%	
Emergency Planning	5-8%	
Prorata Share of Monitoring Project	2%	(estimated)
Proposed "Source Term" Project	2%	(approx.)
Proposed Review of General Assumptions	4%	(approx.)
Public Education/Information	8-10%	
Prorata Share of Monitoring Project	1%	(estimated)
TMI Health & Related Studies	14-20%	
Proposed Re-evaluation of Accident Radiation Releases	8%	(approx.)
Possible TMI Sub-populations	6%	(approx.)
Health Effect of Low Level Radiation	30-40%	
Phase I - Study Population Ranking	4%	(approx.)
Phase II - Population(s) Studies	32%	(approx.)
Reserve	10-15%	
Settlement Administration of Public Health Fund	20-25%	

*/ The currently funded monitoring project is subject to an allocation to reflect its multiobjective character under the Settlement Agreement. For purposes of this report, the Fund estimates an allocation at approximately $200,000, on the basis of $145,000 to emergency planning and $65,000 to public education.

As noted, the Fund employs, upon approval of the Court, scientific consultants who receive compensation of approximately $10-15,000 per month. In addition, as part of its settlement administration duties, plaintiffs' liaison counsel, David Berger, Attorneys at Law, will be entitled to reasonable compensation as to be determined by the Court, at a future date.

DATED: July 31, 1984

Appendix "A"

DISBURSEMENTS FROM THE PUBLIC HEALTH FUND

As of May, 84:

Consultants	$222,062.75
Dosimetry Project	$ 81,619.61
Public Communications and Development of Appropriate Notice Procedure	$ 4,337.00
March 25, 1984 Health Effects Conference	$ 2,712.59
Health Effects of Low Level Ionizing Radiation Literature Review	$ 6,388.00
Local Effects Review	$ 1,006.53
Monitoring Program - Public Meeting	$ 21,930.58
Monitoring Research Program	$ 30,000.00
March, 1983 Public Forum	$ 50,489.48
Penna. Health Advisory Board	$ 3,320.28
Health Effects of Low Level Radiation Workshop	$ 28,124.58
TOTAL	$451,992.00

APPENDICES 2 & 3

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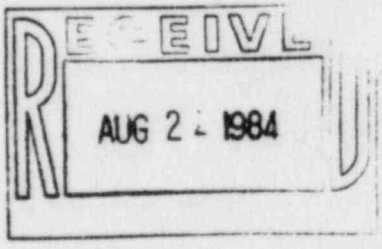
August 21, 1984

FEDERAL EXPRESS



James B. Liberman, Esquire
BISHOP, LIBERMAN & COOK
1155 Avenue of the Americas
New York, NY 10036

Re: TMI Litigation

Dear Jim:

I am enclosing a copy of the Petition which transmitted Dr. Jan Beyea's report to Judge Rambo. As you will note from the cover letter to me, the report is still, at this time, under seal.

Very truly yours,

James M. Sweet

JMS:rmk
Encl.

PEPPER, HAMILTON & SCHEETZ

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August 21, 1984

James McIntyre Sweet, Esquire
Drinker, Biddle & Reath
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Re: TMI Litigation

Dear Jim:

In accordance with your request, I enclose a copy of the "Petition For Authorization to Make Expenditures From the TMI Public Health Fund Relating to TMI Dosimetry Pursuant to Paragraphs 10(b) and 11(b) of the Settlement Agreement." As you know, Dr. Beyea's report remains under seal.

Very truly yours,

Stephen S. Ferrara

SSF/kaw
Enclosures

Doc. 8/21/84

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF PENNSYLVANIA

IN RE: THREE MILE ISLAND LITIGATION	:	CIVIL ACTION NO. 79-0432	

PETITION FOR AUTHORIZATION TO MAKE EXPENDITURES FROM THE TMI PUBLIC HEALTH FUND RELATING TO TMI DOSIMETRY PURSUANT TO PARAGRAPHS 10(b) AND 11(b) OF THE SETTLEMENT AGREEMENT

Pursuant to Paragraph 11(b) of the Stipulation and Agreement of Settlement dated February 17, 1981 ("Settlement Agreement"), plaintiffs' liaison counsel hereby petition the Court for authority to make expenditures from the TMI Public Health Fund ("Fund") under paragraph 10(b) of the Settlement Agreement. This petition transmits a report entitled "A Review of Dose Assessments at Three Mile Island and Recommendations for Future Research" ("Dosimetry Review" or "report") paid for by the Fund pursuant to authority of the Court.

I.
BACKGROUND

In July 1982 and pursuant to paragraph 11(f) of the Settlement Agreement, the Court authorized expenditures to undertake a review of the published literature ("litera-

Rec'd 9/2/81

ture review") on the subject of the extent and magnitude of radiation releases resulting from the accident at Three Mile Island. Pursuant to this authority, plaintiffs' liaison counsel retained Dr. Jan Beyea, senior energy scientist at the National Audubon Society, as principal investigator, to conduct the literature review and to make recommendations for further action relating to the subject of the dosimetry of the accident.

Dr. Beyea has now completed his final report and formally submitted it. The Dosimetry Review, in addition to reviewing the published literature on the radiation dose to the population surrounding the TMI facility, consists of a series of recommendations for further action, subject to the provisions of the Settlement Agreement and the authorization of the Court. The recommendations relate to the convening of a workshop proposed to be chaired by Dr. Beyea (or an appropriate alternate) and a series of other recommendations relating to further research. Authority from the Court is being sought at this time only for the purpose of conducting the workshop as suggested by the Dosimetry Review. If the Court approves the workshop, and if warranted by the discussions at that workshop, a revised report, along with a re-

vised series of recommendations for further action, will be prepared.

Separate authority is being sought from the Court at this time to conduct the proposed workshop because the workshop itself would be an activity likely going beyond the review of literature on the subject of TMI accident radiation releases, previously authorized. Liaison counsel believe that the workshop -- because of its subject -- would fall under paragraph 10(b) of the Settlement Agreement dealing with "studies relating to health effects of the TMI accident or related studies." Paragraph 11(b) of the Settlement Agreement requires petitions for studies authorized under paragraph 10(b) of the Settlement Agreement to reflect the concurrence of counsel for the Pools or the concurrence of the Scientific Advisor, if concurrence of counsel for the Pools is not forthcoming. Concurrence of counsel for the Pools is attached hereto.

II.
DESCRIPTION OF THE FINDINGS AND RECOMMENDATIONS OF THE DOSIMETRY REVIEW

The Dosimetry Review represents an extensive study of the public literature on the subject of the extent and magnitude of radiation releases of the 1979 TMI accident, as

well as subsequent estimated radiation doses received by the population. The report consists of a narrative and six technical appendices. It presents a description of the published literature on the subject of the TMI releases, including the major published studies dealing with the releases of the accident; it identifies areas of uncertainty or questions which have been raised in some of the published literature; and it makes a series of recommendations for further action.

Appendices A and B relate to so-called "noble" gas releases. Appendices C, D and E relate to radioiodine releases. Appendix F relates to potential radiation exposure from the ongoing clean up of TMI-2.*/

The Dosimetry Review recommends that a "dosimetry workshop" be convened to discuss the report's findings and to clarify questions raised about existing studies. It is hoped that the workshop will be able to resolve some of the existing uncertainties in the published literature and focus attention on those questions which may be productively addressed by further study. The Report recommends that all

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*/ Finally, Appendix G contains a bibliography of papers and reports relevant to the Dosimetry Review.

researchers whose work has been reviewed, as well as specialists with expertise in relevant areas, be invited to attend the workshop.

The Dosimetry Review also contains a series of potential research projects to clarify perceived uncertainties on the subject of the TMI releases. Those proposals will also be addressed by the workshop to comment on the scientific merit of pursuing them.

At this juncture, the only proposal which is being presented for approval by the Court is the recommendation to convene the dosimetry workshop.

III.
DESCRIPTION OF PROPOSED SCIENTIFIC WORKSHOP TO CONSIDER THE DOSIMETRY REVIEW

The Dosimetry Review recommends the convening of a technical workshop to bring together researchers who may contribute to resolving uncertainties about radiation releases from the TMI accident. It is proposed that the workshop be closed to all persons except the invitees. Because of the number of persons who have worked on one aspect or another of TMI dose analysis, an attendance of more than 50 persons would be anticipated. It might be desirable to have

a co-author from many of the 100 or so papers listed in the bibliography to the Dosimetry Review. In addition, we propose to invite various technical people who have expertise in areas that have been identified as crucial in the literature review.

The workshop would be a major undertaking. Considerable preparatory work would be required prior to the actual meeting, such as preparation of an "encyclopedia" of dosimetry studies for attendees, to make simpler their task in following and contributing to the proceedings.

Plaintiffs' liaison counsel recommends a two-day workshop chaired by Dr. Beyea or an appropriate alternate. It would be anticipated that various panels would be organized to discuss the major issues. Comments from the remaining attendees would be taken from the floor. The entire proceedings would be transcribed. After the workshop, written material would be solicited and collected from attendees and a post-conference report prepared. If necessary, an update or revision of the Dosimetry Review also would be prepared.

Subject to the approval of the Court, plaintiffs' liaison counsel proposes that Fund money be available to pay the travel and lodging expenses for all attendees. We recognize that on a selective, need basis, some honorariums may have to be paid to avoid hardship to certain key invitees. However, because of the expense associated with a conference of this size, it is not anticipated that honorariums would be paid to salaried employees of government agencies, government laboratories, the Electric Power Research Institute or other large institutions.

Subject to the approval of the Court, we further propose to coordinate with Dr. Beyea on the details of the timing and scope of the conference. If the workshop is approved, it is hoped that it could be held in the calendar year 1984. The following is a tentative budget for the Workshop.

BUDGET FOR DOSIMETRY WORKSHOP

Category	Estimate Expense	
	50 attendees	100 attendees
Travel	$15,000	$30,000
Lodging & Meals	15,000	30,000
Honoraria	12,000	16,000
Report Preparation	12,000	15,000
Workshop Transcription	3,000	3,200
Post-workshop Reports	15,000	20,000
Conference Rooms, Facilities & Misc.	3,000	4,500
TOTAL	$75,000	$118,700

IV.
THE PROPOSED WORKSHOP SATISFIES THE PROVISION OF THE SETTLEMENT AGREEMENT AND SHOULD BE APPROVED

Under paragraph 11(b) of the Settlement Agreement, expenditures under paragraph 10(b) relating to "the health effects of the TMI accident or related studies" are required either to reflect the concurrence of counsel for the Pools or, failing that, the concurrence of the Scientific Advisor. This petition enjoys the concurrence of counsel for the Pools.

Quite apart from this procedural reason for approving the petition, there are important substantive reasons for approving the workshop proposed.

To begin, the workshop is itself an important step in the formulation of recommendations of subjects for further study (subject to Court approval under the Settlement Agreement).

Second, to the extent that the workshop encourages and facilitates a communication of views among its participants, each of whom will have preexisting expertise in one or more aspects of dosimetry, meteorology and the allied

fields, it carries with it a potential for narrowing the range of speculation as to TMI accident releases. A principal purpose of the workshop will be to search for a consensus, if one can be found, on "most probable" release numbers. If such a level of agreement can be found among all those who have in the past offered differing analytic approaches yielding differing conclusions, the necessary predicate will have been established for narrowing the range of speculation as to "possible health related effects" of the accident. Another important subject which would be addressed at the workshop is any additional studies which would narrow the range of speculation as to TMI releases. For these reasons the workshop is warranted by and supports the purposes of paragraph 10(b) of the Settlement Agreement.

Third, paragraph 10(c)(iii) of the Settlement Agreement specifies, as another permissible application of Fund monies, the funding of "public education" on specified subjects. There is uncertainty as to the precise magnitude of emissions during the accident. To the extent that substantial agreement among knowledgeable investigators can be reached as to these questions, publicity as to such concensus might reduce existing uncertainty and further the public education goals of paragraph 10(c)(iii) of the Settlement Agreement.

While nothing is presently contemplated for the workshop in the way of theoretical or experimental scientific developments, the focus instead being on the application of accepted scientific principles to data in hand or to be exchanged at the workshop, it remains possible that a by-product of the workshop may be the identification of subjects or methods for new original research. Such a conclusion might then warrant financial support (if approved by the Court in response to a subsequent petition) under paragraph 10(b) of the Settlement Agreement.

V.
CONCLUSION

For the foregoing reasons, plaintiffs' liaison counsel believe the expenditure authority requested represents a prudent investment which holds promise of a substantial step in furthering several Fund purposes. We urge the Court to conclude the same.

Respectfully submitted,

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DATED: July 10, 1984.