DOCKET NUMBER 50-289
PROD. & UTIL. FAC.

James H. Phillips
107 Nelray Blvd.
Austin, Tx 78751

Dear Mr. Ahearne,

I am writing to urge the restarting of the (undamaged) Unit 1 reactor at Three Mile Island. Dr. Carl Lunden of NASA has raised a question of whether or not it is moral to restart the unit in light of the local success that hysteria fanning organizations have enjoyed. I contend that this depends on the fundamental value upon which ones morality is based. If we take man's life to be the standard, then it follows that the unit ought to be restarted at once. The facilities which are substituting for the unit pose greater relative hazards to the public than unit I ever could.

The unit 2 plant at Diablo Canyon is another example of the sort of unnecessary delaying which tends to present a greater public risk than the power plant itself. Failure to produce, especially failure to electrify, will (I believe) result in a net lowering of our GNP which in turn (I believe) will lower our life expectancy. This is much ignores but the correlations are too clear to be accidental. Impediment constitutes just as real a health risk as irradiation.

Even conservation measures have been shown to routinely trap enough radon in the home to cause a greater increase in background radioactivity in living space than what the Commission allows outdoors around a nuclear plant.

I would greatly appreciate the inclusion of these factors in future licensing deliberations. No one can deny that decreasing our dependence on foreign oil supplies will decrease the likelihood of our getting involved in hostilities abroad.

Thank you for your time and attention.

Cordially,

8103300389

H

D503
S.1/1

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289 Bob
CONGRESSMAN ALLEN E. ERTEL

PLEASE RETURN TO:

☐ Harrisburg East Mall Paxton Street Harrisburg, Pa. 17111 Phone: 564-8965	☐ Mobile Office c/o Box 488 Federal Building Williamsport, Pa. 17701 Phone: 326-2814	☐ 240 West Third Street Federal Building Box 488 Williamsport, Pa. 17701 Phone: 326-2814

[illegible] MUST BE SIGNED BELOW

Date: 3-6-81 Taken by: Diane Goldberg

NAME: Don Hossler

ADDRESS: 501 Vine St Middletown PA 17057

TELEPHONE NUMBER: 944-2250

SOCIAL SECURITY NUMBER(S):

VETERAN'S "C" NO.

NATURE OF PROBLEM:

Over 1/3 of the people who signed up for "limited appearances" at the NRC TMI 1 hearings.

He thinks they should have another hearing so the people can be heard. Written responses from the people are not adequate - they can be ignored more easily by the NRC than can spoken responses.

I hereby authorize Congressman Allen E. Ertel or his representative to act on my behalf and to have access to any records pertaining to this matter.

DOCKETED [illegible]

(Signed) ______________________

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

March [illegible]

[illegible] Gentlemen

We expected so much in the dividend we received from G.P.U., to supplement our income. After two years since the accident at Three Mile Island we must say we're very discouraged. It seems no one offers any help for the ailing utility Co. After all it was an accident and thank God no one was hurt.

Why can't they use Plant No. 1 to generate electric power? And clean up operations at same time. If the utility doesn't get on its feet we may go down the drain and unemployed. Thank you so much, from a couple of small investors.

Yours truly,
Mr. James Pierro Mrs. Pierro

JAMES PIERRO
BOX 186
UNION CITY, N.J.
07087

5307 Aspinwall Blvd
Cleveland O 44127
March 9, 1981

DOCKET NUMBER
PROD. & UTIL FAC. 50-289

Mr Ahearne:

If I could, I would kick the whole Nuclear Regulatory Commission out of office, and replace you with public officials who care about us, the people, and who do not bow down and serve the god of greed - namely the nuclear industry!

That you would even consider opening Unit I of Three Mile Island after the near catastrophe there with Unit II is both reprehensible and ridiculous since you have been warned by Union of Concerned Scientists and others of the lethal damage of

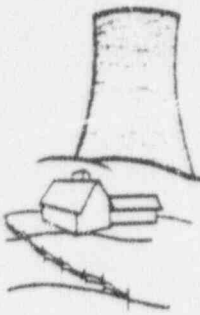
nuclear power and the battle defeats for nuclear power plant construction!

Where are your brains gentlemen, and more to the point where are your consciences and your hearts?

Sincerely yours,

Barbara Keener

P.S. I hope the enclosed literature will enlighten you!



Three Mile Island Legal Fund

Dear Friend:

We offer our heart-felt thanks to you. Your generous contribution to the Three Mile Island Legal Fund has enabled us to carry on one of the most important fights against nuclear power.

Two years after the accident, the press no longer considers the story of the accident at Three Mile Island to be headline news. Yet, we face a situation that is perhaps even more grim than ever before.

The clean-up of the highly radioactive damaged Unit 2, once projected to take 4-5 years is now expected to require a total of 9 years! And, while the residents of this area must cope with the continuous stress from living in the shadow of the still dangerous reactor, Metropolitan Edison is moving toward restarting Unit 1, the twin of the damaged reactor!

We believe that Unit 1 should not be allowed to restart, and we have spent thousands of hours in hearings before the Nuclear Regulatory Commission. Despite the testimony from many experts that the plant should not be restarted, the president of General Public Utilities (the parent company of Metropolitan Edison) has requested that the NRC allow the plant to restart before the hearings are completed.

We have learned, as in the case of the venting of the radioactive krypton gas last July, that the utilities and the NRC often ignore the process of public hearings and proceed to do whatever they want to do without restraints.

In the case of the krypton venting, the NRC allowed Metropolitan Edison to release the krypton gas into the atmosphere without a notice and hearing as required by statute! The court later stated that the venting without a hearing was illegal, but the pronouncement was made after the radioactive gas was already vented! We fear that the same type of action will again take place, and that once again our human rights will be violated.

On other fronts, our fight to prevent the dumping of 700,000 gallons of radioactive water into the Susquehanna River (which is the source of drinking water for many residents) also continues in full force. It is possible that the fight surrounding this issue will reach the Supreme Court level. If the Supreme Court agrees to hear the case, it will mean an enormous expenditure of funds for preparation of extensive legal briefs, -- necessary in presenting our argument.

-cont'd-

1037 MAOLAY STREET HARRISBURG PENNSYLVANIA 17103

We need your help. Your warm support has been an inspiration to many a weary volunteer, and our small, but dedicated staff. Your generous financial support has made it possible for our coalition of groups* to carry on from day to day.

Now, however, we must intensify our efforts even more. To do so, we need financial help. The nuclear industry has plenty of money for their lawyers, but we must depend upon our own contributions and those of people such as you. Many of us have given of our own personal resources, as well as our time, and we must turn to you once again for help. We are not only fighting for our safety -- we are establishing precedents that may help others -- if there is ever another accident in another part of the country.

We ask you once again to assist with a contribution of $25, $15, $50, $100 or whatever you can afford. Your help makes a big difference as we fight the nuclear industry.

Sincerely yours,

Donald Konkle

Donald Konkle
President
Three Mile Island Legal Fund

P.S. The nuclear industry and its supporters are flooding the Nuclear Regulatory Commission with letters of support for the restart of Unit 1. We think it is important for the NRC to hear from people who believe that Unit 1 should not be restarted. If you share this view, we encourage you to write to the NRC expressing your opinion. Your letter will help our cause. The address is:

Mr. John Ahearne, Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

*The Three Mile Island Legal Fund Coalition includes the following groups:

THREE MILE ISLAND ALERT, Harrisburg
PEOPLE AGAINST NUCLEAR ENERGY, Middletown
NEWBERRY TOWNSHIP TMI STEERING COMMITTEE, Newberry Township
SUSQUEHANNA VALLEY ALLIANCE, Lancaster
ANTI-NUCLEAR GROUP REPRESENTING YORK, York
ENVIRONMENTAL COALITION ON NUCLEAR POWER, State College

Reprinted from The Boston Globe Friday, March 28, 1980

One year after TMI, and danger remains

By EDWARD J. MARKEY

Shortly after the reactor at Three Mile Island went haywire a year ago today, a team of radiation experts was sent from Washington to prepare an evacuation plan for a 20-mile radius around the stricken plant. No workable evacuation plan existed for the people in neighboring communities in the event of a serious accident. Fortunately, the runaway reactor was brought under control and no general evacuation was required.

Have the glaring safety deficiencies revealed one year ago — such as the absence of emergency plans — been corrected? What have we accomplished in upgrading safety at our existing nuclear plants?

Response to TMI seems to have been characterized more by paralysis than by aggressive action. Two major studies of the accident independently concluded that the Nuclear Regulatory Commission (NRC) cannot, with its present staff and attitudes, guarantee the proper degree of safety at our existing plants.

Yet one year later, the staff of the NRC remains intact. No commissioners or top staff have been fired for TMI or related reasons. Serious safety problems remain ignored. Operating plants have not been carefully reviewed. The licensing procedure still does not permit an examination of the consequences of a release of radiation from a plant.

An action plan for TMI-related safety improvements has been drafted by the NRC staff. But the majority of its recommendations will not be implemented for months or even years. The moratorium on licensing new plants has been lifted. In sum, we see a return to "business as usual" by the NRC, almost as if the accident in Pennsylvania had never happened.

The absence of approved evacuation plans was starkly evident in the disorganized emergency efforts during the TMI accident. Although light water reactors cannot explode like a bomb, they do contain over 1000 times the radiation of the Hiroshima bomb. If the reactor's concrete containment were ever breached, radiation could spread across the countryside like a rain of death, poisoning large areas downwind of the plant.

Evacuation plans are crucial buffers against death and injury. If half the Strontium 90, Cesium 137 and other radioactive isotopes in an average reactor were scattered by the wind, a lethal dose of radiation could be delivered within four hours to everyone inside an area six miles long and one mile wide.

That area could double within 24 hours and eventually increase to more than 50 miles downwind. Unless evacuation were begun in advance of the radioactive "plume," people would receive lethal doses of radiation.

In the past, the NRC only required the utility to outline how a few people — mainly those at the plant site — would be evacuated. State plans to evacuate people inside a five-mile radius around each plant were voluntary and not required to conform to federal guidelines. In December, Massachusetts civil defense planners submitted plans on how to evacuate within a 10-mile radius of the Pilgrim plant in Plymouth and the Yankee Rowe plant east of North Adams.

But many experts believe that evacuation inside a 10-mile radius may not be enough. Even during the TMI accident, evacuation was being considered for a 20-mile zone. The Rogovin panel — an independent probe of the NRC's actions during the accident — considered calling for a 30-mile radius in their draft report. That figure was deleted in the final version, but they did criticize the 10-mile limit as "inadequate."

One year after TMI, there are still 41 existing plants in 16 states without federally approved evacuation plans. There are 12 more plants in nine states without approved plans scheduled to go into operation by the end of 1981.

Congress, like the NRC, has failed to move vigorously in the past year to upgrade safety at existing reactors. We are still considering whether to link the operation of new and existing plants to federal approval of state emergency plans.

That issue is now before a House-Senate conference committee as an amendment to the 1980 NRC budget. Will a majority of the conferees decide to demand federally approved emergency plans as a condition of licensing nuclear plants?

The American Nuclear Energy Council and others in the nuclear industry oppose this step. So does the Carter Administration, which would leave the matter to the NRC. Nuclear proponents threaten to kill the legislation when it returns from the conference committee unless it is shorn of even a compromise version of the emergency planning language. Other fundamental issues have not even been addressed by Congress and the NRC.

The American Nuclear Energy Council calls tougher safety standards — like requiring approved evacuation plans — a "guillotine" for nuclear power. The real guillotine is the danger of nuclear accidents and the absence of credible emergency plans to cope with them.

Edward J. Markey is a Democratic congressman from Massachusetts and a member of two House energy subcommittes.

Reprinted from THE PHILADELPHIA INQUIRER
Wednesday, June 18, 1980

TMI called a 'high-level waste dump'

By Mark Bowden
and William Ecenbarger
Inquirer Staff Writers

An anti-nuclear group filed a complaint in federal court yesterday charging that extremely hazardous nuclear waste material is being stored unsafely at the Three Mile Island nuclear power plant.

In a complaint filed in Harrisburg with U.S. Middle District Judge Sylvia Rambo, the Susquehanna Valley Alliance, a group based in the vicinity of TMI, argued that a water-filtration system called EPICOR 2 had turned the plant into a "high-level waste dump."

The EPICOR system has been filtering radioactive elements out of mildly contaminated waste water left from the March 28, 1979, accident at TMI. As a result, the filters themselves have become contaminated, and it is these used filters, now being stored at the plant, that the alliance says pose a safety risk.

Tom Elsasser, a spokesman for the federal Nuclear Regulatory Commission (NRC), said the filters were being stored in a special concrete bunker that is flood-proof and thus completely safe.

The alliance's complaint was amended to a lawsuit the group filed last year against the NRC and Metropolitan Edison Co., operator of the nuclear plant, asking that no EPICOR-treated water be dumped into the Susquehanna River. That lawsuit is waiting to be heard by Judge Rambo.

As a result of filtering the contaminated water, the EPICOR filters, called "spent resin liners," are contaminated primarily with cesium 137 and strontium 90, two of the most dangerous radioactive elements.

If released into the outside environment, both elements would be likely to become a part of the food chain that leads to man. Cesium 137, which loses half of its radioactivity every 33 years, tends to accumulate in muscle tissues. Strontium 90, whose radioactive half-life is 26 years, tends to accumulate in the bones.

"No licensed waste disposal facility in the country will take wastes this hot," said Jean Kohr, an attorney for the alliance. "These elements, if you drink a glass of water that contains them, will become bonded to the bones and teeth in your body...for years and years and years, causing cancer and death."

The level of radioactivity inside the spent resin liners is actually far lower than that in spent fuel assemblies, which are being stored on-site at operating nuclear power plants around the country. This form of storage is being allowed pending the establishment of a national high-level nuclear waste burial site, which is not expected to be created until the late 1980s.

Reprinted from
THE PATRIOT EVENING NEWS
Monday, July 21, 1980

Radiation tally on TMI 'lacking'

BALTIMORE (UPI) — Government officials do not know precisely how much radiation escaped from Pennsylvania's Three Mile Island Nuclear plant in March 1979 and have not lived up to promises to study the accident's long-term impact, it was reported Sunday.

The Baltimore News American, in a copyrighted article, reported a three-month investigation showed federal and state agencies have failed in their response to last year's accident.

The newspaper charged:

—More than one year has passed and no government agency has been directed to investigate possible long-term environmental damage resulting from the accident.

—Requests by farmers for examinations of diseased and dead animals after the accident have been ignored.

—Despite his pledge to determine the consequences of the accident, Pennsylvania Gov. Dick Thornburgh is unable to name a single agency or person conducting any studies.

The News American also said federal and state officials acknowledge they cannot gauge precisely how much radiation escaped from the plant, located 45 miles north of Baltimore, because they did not have adequate equipment on hand when the accident occured.

"There are still some questions of just how much I-131 (radioactive iodine) was released early in the accident... We don't know if there were other releases early on, other than from the stacks," said Thomas L. Gerusky, chief of the Pennsylvania Bureau of Radiation Protection.

The state's Emergency Management Agency found it was unprepared to evaluate what was leaking from the nuclear plant because its radiation-detection equipment was incapable of picking up the type of radiation released, the newspaper said.

DOCKET NUMBER 50-289
PROD. & UTIL FAC.

March 2, 1981

Mr. John Ahearne, Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Ahearne,

I wish most fervently to urge you against the restarting of the Three Mile Island Unit 1.

If this nuclear plant is allowed to go ahead as if nothing had happened then the operation of nuclear power plants in my part of the country becomes much more likely, a proposition which I find, due to all we now know, intolerable. It is now obvious that not only has no way yet been found to dispose of nuclear wastes, but that

(over)

it is now quite certain
that no wolf can will be.

Sincerely,

Gloria Howarth
5400 Foster
Shawnee Mission,
Kansas
66202

Patricia Alker
N. Trooper Rd.
Norristown, RD#1, Pa.
19401

March 9, 1981

DOCKET NUMBER
PROD. & UTIL FAC. 50-289

DOCKETED
USNRC
MAR 16 1981
Office of the Secretary
Docketing & Service
Branch

James Ahearne, Ch., NRC.
1717 H St., N.W.
Washington DC.
20555

Dear Mr. Ahearne,

Your commission has advised immediate clean-up of TMI due to contamination of the Susquehanna and danger of a core melt-down from a chain reaction. Recently your staff attorney advised the restart of Unit I, ticking off all the financial benefits of putting this unit 'back on line!

I can't believe you are acting in the best interests of the people in Pennsylvania by approving this action. Before the Commission decides, I would suggest one member (a literate) would read "Voices from Three Mile Island" by Robert Leppzer. I found the book in our public library in Norristown, Pa. - 215-277-3355.

The health of an environment can be gauged by it's animal population - that is why this book is important. We live 8 miles downwind from Limerick [illegible] livestock!

Sincerely,

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

March 3, 81

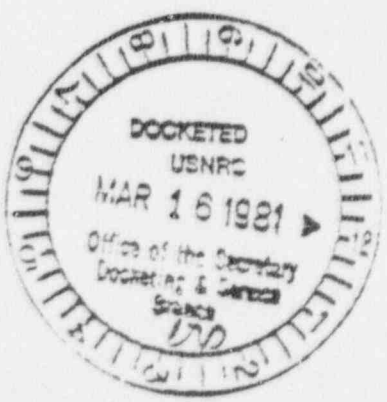
1

Dear SIR:

I AM WRITING TO SAY, I AM TOTALLY AGAINST UNIT ONE AT THREE MILE ISLAND EVER TO OPEN UP AGAIN.!!

IF THEY CHANGE TO COAL, THIS WOULD BE FINE,

I LIVE 7½ |



2

MILES FROM THAT
DEATH TRAP.

I HAVE 3
CHILDREN.

I DON'T WANT
TO HEAR THAT NO ONE
DIED AT TMI, COME
BACK IN 30 YEARS &
IF MY CHILDREN DO
NOT HAVE CANCER, I
WILL AGREE WITH YOU!
TMI IS THE
SILENT KILLER!!

KATHY HERBEIN
625 CARBON AVE
HARRISBURG

DOCKET NUMBER
PROD. & UTIL FAC. 50-289

3355 Bennett Drive
Hollywood, CA 90068
March 9, 1981

John F. Ahearne
Chairman
Nuclear Regulatory Comm.
1717 "H" Street NW
Washington, DC 20555

Dear Mr. Ahearne:

It seems to us that you should do all that you possibly can in the matter of THREE MILE ISLAND. We definetely feel it should be shut down. After all that has happened there we should be doubly cautious about reopening it too soon.

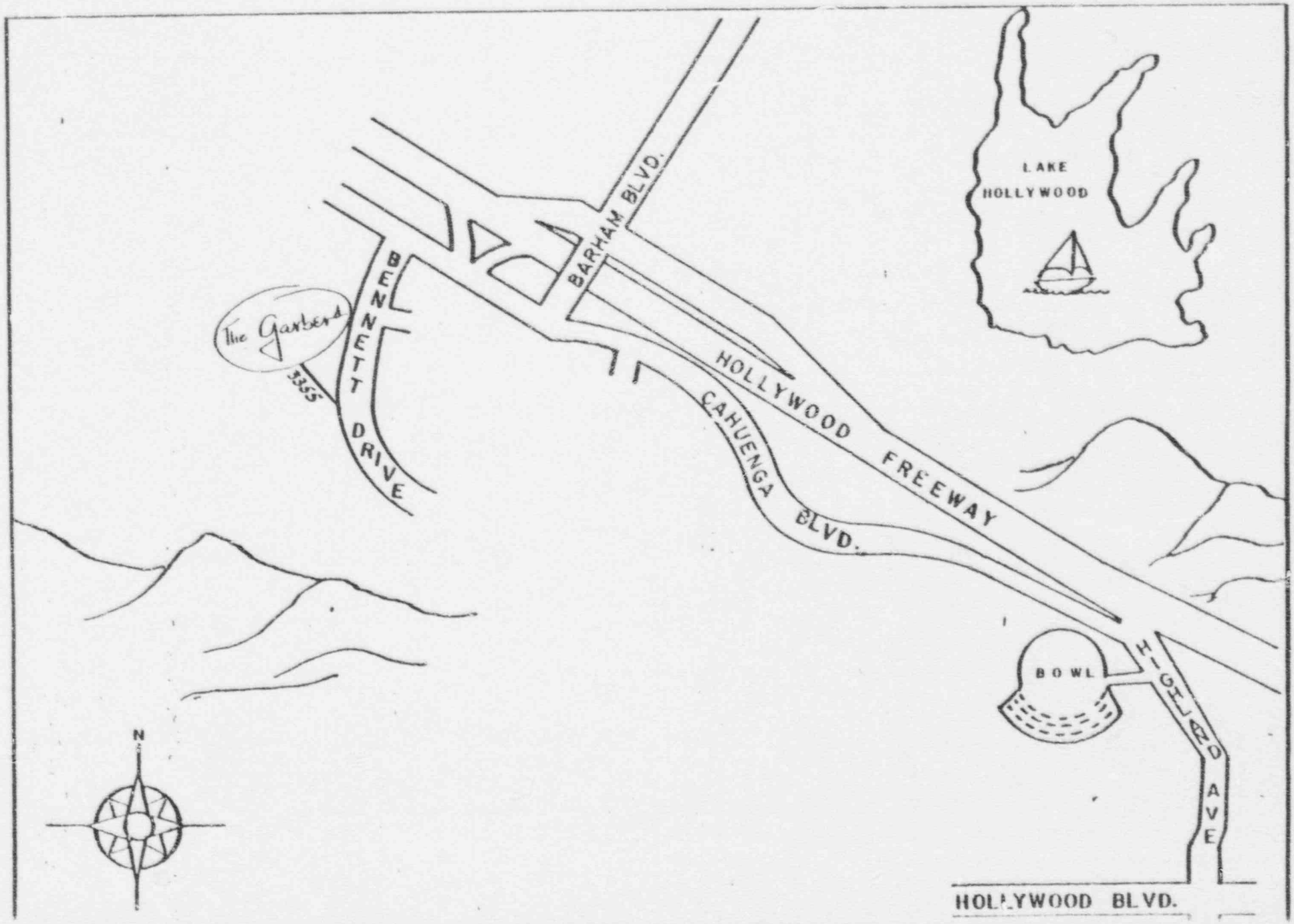
Therefore, we can only repeat that we urge that it not be returned to service. One horrendous error there was enough.

With good wishes,

Sincerely,

Dorothy K. Garber

Mr. & Mrs. Jack Garber


LAKE
HOLLYWOOD
BARHAM BLVD.
BENNETT DRIVE
The Garden
3355
HOLLYWOOD FREEWAY
CAHUENGA BLVD.
BOWL
HIGHLAND AVE
HOLLYWOOD BLVD.
N

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289 (Restart)

130 Brown Avenue,
Prospect Park-
Paterson, New Jersey 07508
March 2, 1981

The Honorable Victor Gilinsky
Commissioner
U. S. Nuclear Regulatory Commission
Washington, D. C.

Dear Commissioner Gilinsky:

This correspondence is in reference to Docket No. 50-289SP concerning Three Mile Island Unit #1 of Middletown, Pa.

It is a fact that Three Mile Island Unit 1, now closed by the Nuclear Regulatory Commission, was not involved or damaged in the accident at TMI Unit #2 in March of 1979. Moreover, a poll taken last spring in cities near TMI indicated that in excess of 58% of the residents favored restarting the undamaged reactor.

Since the incident, the U.S. electric power industry has responded quickly and forcefully to correct inadequacies indicated by the accident. Those corrections have been and are now being made at the undamaged unit. As a result, this unit, like plants elsewhere, is even safer than it was before it closed for routine inspection and refueling way back in 1979.

Moreover, it is costing Metropolitan Edison and its customers nearly $500,000. a day ! That is, $500,000. daily to purchase more expensive coal and oil instead of uranium for use as fuel.

Please lets get Three Mile Unit #1 back on line as soon as possible.

Thank you.

Very truly yours,

Vincent D. Waraske

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

OFFICE OF THE
COMMISSIONER

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289 (Restart)

March 10, 1981

Mr. Vincent D. Waraske
130 Brown Avenue
Prospect Park
Paterson, New Jersey 07508

Dear Mr. Waraske:

Thank you for your recent letter regarding the restart of the Three Mile Island Unit 1 reactor. I have asked that your letter be served on the parties of the TMI-1 Restart Proceeding.

Sincerely,

Victor Gilinsky
Commissioner

JIM SASSER
NEBRASKA

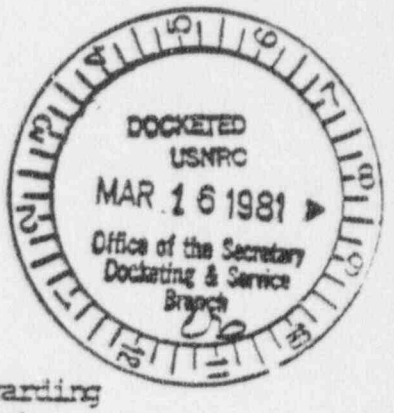
DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

COMMITTEES:
APPROPRIATIONS
BUDGET
GOVERNMENTAL AFFAIRS
SELECT COMMITTEE ON SMALL BUSINESS

United States Senate

WASHINGTON, D.C. 20510

March 4, 1981



Mr. Carlton Kammerer
Director
Office of Congressional
Affairs
Nuclear Regulatory Commission
1717 H Street, N.W.
Washington, D.C. 20505

Dear Mr. Kammerer:

Recently I was contacted by Stuart L. Schoff regarding the shutdown of Three Mile Island Unit 1. A copy of that communication is enclosed.

Any comments or information that you may be able to provide would be very much appreciated.

Thank you for your time and attention.

Sincerely,

Jim Sasser
United States Senator

Enclosure

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

Stuart L. Schaffs
703 Hillside Avenue
Marquette, Tenn. 37801

15

FEB 4 1981

DOCKETED
USNRC
MAR 16 1981
Office of the Secretary
Docketing & Service
Branch

The Hon. James R. Sasser,
Russell Building,
Washington, D.C. 20510

Docket 50-289, TMI-Unit 1, Middletown, PA

Dear Sir:

It has come to my attention, and I wish to call it to yours, that our government shut down, and has kept shut down, Three-Mile Island Unit 1, which was not involved in, nor damaged by, the accident that knocked out Unit 2 nearly two years ago.

Unit 1, I am told, is essentially like many other nuclear plants around the country, for all of which modifications were ordered after the accident. These plants continue to produce power, without creating problems, while the modifications are being made -- except for Three Mile Island Unit 1, which remains shut down, producing now power, although the modifications have been made. What is the logic of this situation?

It costs Metropolitan Edison and its customers $500,000 a day extra to burn coal and oil instead of using uranium. Shutting down and keeping shut down a plant that has not been damaged, and yet has been made safer than it was previously, looks like discrimination to me. Isn't this another case of bureaucratic overkill? Or is it some kind of punishment? Worth noting is a poll taken last Spring that indicated 58 percent of the residents in cities near Three-Mile Island favored restarting the undamaged reactor.

With the USNRC holding hearings on restarting TMI-1, the members need to bear in mind that (1) nuclear power is safe, inexpensive, and needed; (2) TMI-1 is different from TMI-2; (3) TMI-1 has been modified and should be restarted without delay; and (4) the NRC has waited too long already to resolve the fate of TMI-1.

Sincerely yours,

R.D. 7, Box 322
Gettysburg, PA 17325

March 9, 1981

Dear N.R.C.,

I have just learned that you are in the process of deciding to recycle radioactive contaminated metals into general use metals. I would like to say personally that such a plan is completely unacceptable. The additional cancer to foundry men, machinists, and consumers of the products would be plain murder. I would like to have a full copy of this ridiculous proposal.

Secondly I want to state my opinion of the re-opening of the TMI unit one plant as a nuclear power plant. The unit should be changed to a conventional power plant for safety and high efficiency. Unit one could be changed to coal, wood chips, or compressed garbage pellets from nearby towns and cities. Nuclear plants are approximately fifty percent less efficient than conventional fired generating plants. because the steam temperature cannot be brought up to the high super heated steam of conventional power plants. I fail to feel safe in living near a nuclear power plant due to the fact that the reactor vesse are carbon steel which melts at 2900 degrees F and the nuclear fuel in an uncontrollable situation of loss of coolant will heat up to 12,000 degrees F. That is four times the melting point of carbon or stainless steel. Could you please send a list of proposed safety changes of Unit One? I would also be interested in the environmental impact study of the clean-up of TMI unit two.

Sincerely,

Mr. Wayne N. Jones

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

Jeanette Pinder
212 Atkins Avenue
Wilmington, DE 19805

March 9, 1981

U. S. Nuclear Regulatory Commission
Washington, D.C.

Commissioners:

The fact that the restarting of TMI Unit 1 is even being considered seems ludicrous to me in view of the fact that Unit 2 is full of radioactive material and no one knows when - or even if - it will be cleaned up.

Residents are obviously opposed to the re-start because of Metropolitan Edison's lack of credibility and because of fears which are completely justified. I share these fears even though I live sixty miles away.

The eighty nine incidents should not be taken lightly, since it was a series of incidents such as these which caused the near melt-down.

Sincerely,

Jeanette Pinder

DOCKET NUMBER
PROD. & UTIL FAC. 50-289

2455 George Washington Way E129
Richland, Washington 99352

March 10, 1981

Mr. John F. Ahearne
Chairman, U.S. Nuclear Regulatory Commission
1717 H Street, NW
Washington D.C. 20555

Dear Mr. Ahearne:

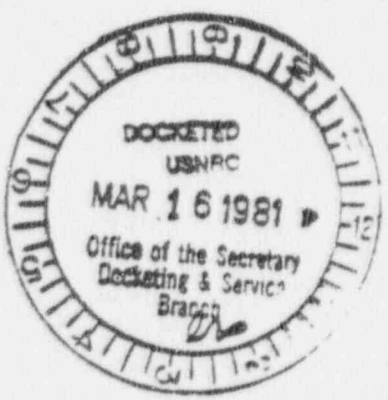
THREE MILE ISLAND UNIT NO. 1
NRC Docket No. 50-289SP

The only reasons that TMI Unit 1 sits idle, bankrupting Metropolitan Edison, causing us to import more foreign oil, and damaging the future prospects of the nuclear industry, are political.

I'm a voter; you're a political appointee. So here's some political pressure in the other direction:

Do your job and get TMI Unit 1 started!

Thanks.



Sincerely,

Bob Musselman

R. P. Musselman

DOCKET NUMBER
PROD. & UTIL FAC. 50-289

1707 Rocky Canyon Rd.
Arlington, Texas 76012
3/5/81

John Ahearne, Crm.
US Nuclear Regulatroy Commission
Washington, D.C. 20555

Dear Mr. Ahearne,

For a long time, I, as is true for many Americans across the country have been more than a little concerned about the entire Three-Mile Island nuclear plant accident. Through various sources I try to keep up with developments as your agency and others attempt to deal with the result of that tragic occurrence. I understand that the NRC is attempting to restart one of the units at the plant, and I strongly urge you not to do so, but rather to join with other professionals in the industry and citizens/consumers to find a safer form of energy.

Thank you,

Kay Tasbel

Kay Tasbel

Julia Corliss
PO Box 247
Fairfax, Calif. 94930

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

Mr. John Ahearne, Chr.
U.S. Nuclear Regulatory Comm.
Washington D.C. 20555

March 9, 1981

Dear Sir,

I am writing to urge you and the other decision makers at the NRC not to restart Unit 1 at Three Mile Island. The problems surrounding the clean-up at Unit 2 are mammoth, as you obviously know. The people who live in that area are feeling continual mental and emotional stress from the lurking threat of what they can neither see, taste, or smell--radio-active contamination. Knowing that Unit 1 is shut down helps allay this stress some. Do not start it up again, please. Also, I would urge you not to allow dumping of 700,000 gallons of radioactive water into the Susquehana River (from Unit 2) because this is a source of drinking water for people and animals, as well as a source of crop irrigation. I also think it was wrong for you (the NRC) to allow Metropolitan Edison to release krypton gas into the atmosphere without a notice and hearing as required by statute. This was a flagrant violation. I know you are under pressure to clean up, but you employ some of the best brains in the country. Surely, a safer solution could be arrived at. And if it can't, if there is no way to clean up without contaminating the environment with radioactive materials, then it is time to re-evaluate the moral responsibility the nuclear industry has to the living things of this planet, plants, animals, and people.

Thank you for reading this letter.

Sincerely,

Julia Corliss

Julia Corliss

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

Frank D. Szachta, PE
1452 BAYONNE • ST. LOUIS, MISSOURI 63138

Mr John F. Ahearne
Chairman, US Nuclear Regulatory Comm.
1717 H Street, NW
Washington, DC 20555

3-3-81

Dear Mr Ahearne:

As an engineer and interested citizen I am writing concerning the re-start of nuclear plant TMI-I, NRC docket No. 50-289SP, TMI-Unit 1. As I understand the data, all repairs as dictated by the TMI-Unit 2 findings are made or being made and that the failure to re-start Unit 1 is costing the consumers from $12-14 millions per month. We all know that the purchase of power from other utilities is increasing the coal and oil energy problems and an early re-start of this plant is surely in the local and national interest.

Respectfully yours

Frank D. Szachta, PE

cc. NEAS
Rep Wellman
Sen Eagleton
Sen Danforth

10912 El Capitan Cir
Sun City, Az 85351
3/4/81

DOCKEY NUMBER 50-289
PROD. & UTIL. FAC.

Dear Mr. Ahearne:

In regard to the T.M.I. Three Mile Island situation with particular reference to T.M.I. Unit 1 it seems incredible that this unit sits there idle while the company faces extreme financial difficulty.

I never did understand why your Commission waited until the first of this year to even start hearings. And certainly now it would seem that the matter should be rapidly brought to a conclusion.

Very truly yours,
Harry O. Gray

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

Mrs. Florence J. Lynch
216 Wilson Street
Bridgeport, Connecticut 06605

March 5, 1981

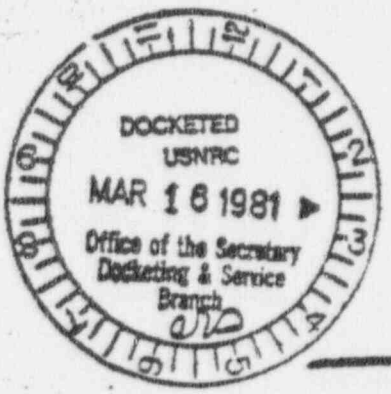
Mr. John Ahearne, Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Ahearne:

I am strongly opposed to the restart of Unit 1.

It is too bad that persons so eager to restart Unit 1 cannot be forced to live nearby!

Very truly yours,
Florence J. Lynch



3-2-81

Davis
1305 N 8th
Boise, Id.
83702

Dear Mr. Ahearne,

Please vote to keep Unit 1 at Three Mile Island Closed. It looks like years of clean-up ahead and it is too unsafe to allow people to work next door. I am very concerned about my family and friends who live beside TMI.

Sincerely,

Mark J. Davis

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

Dear Sir:

With our dependence on foreign oil, it is a disgrace that our system has allowed Three Mile Island, Unit 1, to remain shut down. There is no reason for this to have happened. Any corrective actions and additional training could have proceeded along the same schedule as the other B+W units that are now operating.

The Diablo Canyon mess is so disgusting, I hate to admit that Governor Brown and his state energy boys are even americans. California is due for some real house cleaning in their state government. The NRC should be a positive force in getting Diablo Canyon licensed and on the line!

Lets get the politics separated from the technical facts in all phases of nuclear power and get this country moving again!

Ray Mulkern

NRC
DOCKET
50-289SP
TMI-UNIT 1

February 5, 1981

James P. Ahearne
U.S. Nuclear Regulatory Commission
1717 H Street NW
Washington D. C. 20555

Dear Mr. Ahearne et al: Docket 50-289SP, TMI-1 Middletown, Pa.

It is a FACT that Three Mile Isla nd 1, noe closed by the Commission was not involved in the accident at TMI 2, neither was it damaged.

The people in the area have been polled and indicate that they want TMI 1 restarted. Similiar plants are being operated while modification is going on.

The decision to keep the undamaged unit closed is irrational, unfair a nd just another example of Beureaucratic Bungling. It is costing Metro Edison and it's customers to buy expensive coal and oil, about $500,000. per day.

Now hearings will cost tens of thousands of taxpayers dolla rs and all because of mismanagement on the part of the Commission. You all know that properly installed nuclear power generators are safe, TMI-1is different from TMI - 2, TMI -1 has been modified a nd should be started IMMEDIATELY.

Furhtermore, the unusual delays that the Commission creates in it's Burea ucratic Slow Down Process is costing America Billions of Wasted Dollars.

Another example of over-regula ting is at Midla nd, Mich. Unwarranted Slow Downs of various approvals has cost us stockholders and the customers over a Billion Dollars, one of the best ways to Fight Inflation is to get Government out of our Pockets. We need rational regulation, but at the present time 50 irrational Anti-Nuclear Demonstrators can cost the public Millions of Dollars based on nothing more than Sensationalism.

Let's become more realistic in our approach to Nuclear Energy. If there is an Energy Shortage??? letts solve the problem not become a part of the Problem.

An Irate Taxpayer,

F. A. McCallum

F. A. McCallum
75-6082 Alii Drive
Kailua-Kona, Hi 96740

and 1020 Orchard St
Alma, Mich 48801

DOCKETED
USNRC
MAR 16 1981
Office of the Secretary
Docketing & Service
Branch

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

3-6-81

Dear Sir,

As an engineer I cannot understand our nation's reluctance to develop nuclear energy to the fullest extent. We should not allow the leftist in our society, who are actually working to ruin our nation, prevent this development. [illegible] to our satisfaction [illegible] no real danger. [illegible] licence TMI-1 [illegible] & 11 other plants.

Raymond V Smith
2505 N Vermont
Okla City, OK 73107

MCALESTER OK
MAR 7 1981

OKLAHOMA CITY
PM
6 MAR
1981

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Mr. John F Ahearne
Chairman, US NRC
1717 "H" STREET NW
WASHINGTON, D.C. 20555

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

Dear Mr. Ahearne,

Subject - Docket 50-289SP
TMI - UNIT 1
Middletown, Pa.

It's time to put the past behind us and move ahead. The accident at TMI-2 while serious, will be as nothing compared to the next oil boycott. Having learned from the accident, there is no longer any practical reason not to start TMI-1. America must have Nuclear Energy.

Sincerely,
Kenneth Tansey

KENNETH R. TANSEY
RT. 1
FAIRFIELD, ME.
04937

AUGUSTA, ME
MAR 9
PM
1981
04?

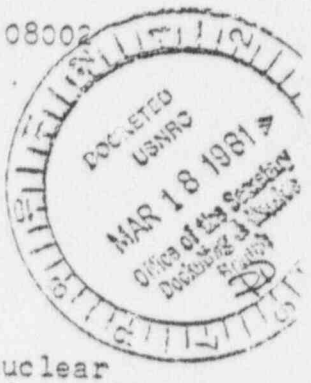
USA 10¢

Battle of Cowpens, 1781

Mr. John F. Ahearne
Chairman Commissioner
U. S. Nuclear Regulatory Commission
1717 H. Street, N. W.
Washington, D. C. 20555

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

Janet B. Allen
109 Garfield Ave.
Cherry Hill, New Jersey - 08002



Mr. Gary Sanborn
United States Nuclear Regulatory Commission
Office of Public Affairs, Region 1
631 Park Ave., King of Prussia, Pa. - 19406

February 22, 1981

Dear Mr. Sanborn:

I wish, once again, to urge the banning of all nuclear power plants. I am opposed to restarting Unit 1 at TMI. I feel all nuclear plants should be shut down. The lesson at TMI should be enough: the "clean-up" is far from accomplished, while the seepage and venting continues. The public is fed talk of "safe levels" and "containment" to pacify anger and fear, while the truth is obscured and the authorities stall, hoping the usual lack of interest will finally set in.

I, for one, cannot imagine how the NRC can continue to skirt the issue and stall, instead of firmly banning all nuclear activity until every phase of it is 100% safe from any radiation leaks to soil, water, or atmosphere - even years from now. This includes at the plant site, during transportation, and during storage of the radioactive waste material. It is irresponsible to assume that any vessel could completely contain the waste for the duration of its radioactivity.

Since the storage of the radioactive waste is impossible to contain forever, even if it could be safely transported - (to what locality? Nobody wants it nearby.)- the seepage and subsequent damage to populace, creatures, water, land, air, etc. appears later. It is time now to admit the dangers and stop them. The only way to stop the danger completely and surely is to scrap all nuclear fission plants.

I suggest you include Dr. John Gofman in your public sessions, and allow his views to be included in your reports and publicity. A pioneer in nuclear power, he is now preaching against it. Years of studing the effects of radiation have convinced him that no level of radiation is "safe".

The arguments that nuclear fission plants are necessary for economic energy must be countered with the actual dollar cost of clean-up and containment for TMI, etc. Now the public is expected to pay for it. The public cannot afford to pay for TMI, or for any future accidents there or at other nuclear plants. Each accident is ultimately reflected in increased costs to the public through rate hikes. If the utility companies had to pay for the clean-up themselves, they would soon conclude that the nuclear plants were not such a "bargain". Well, it's no bargain for the populace to have to foot the cost, either. Adding the monetary cost of repairs, clean-up, storage of wastes, etc. to the regular cost of the power presents an entirely different economic picture. To this you must add the incalculable cost of future damage from seepage from waste facilities, etc.

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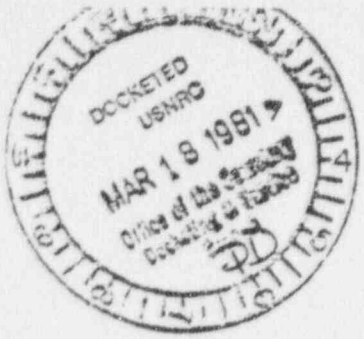
Added to the hazards of regular operational accidents at the plant, in transit, and during indefinate storage, and the potential economic strain of paying for them, there is the possibility of sabotage and of very real danger of vulnerability for tremendous disaster in the event of war.

Please do not allow the pressures of the false economy of nuclear energy convince you of its safety. Listen to the real experts, like Dr. John Gofman, and to the concerned public who has no desire to suffer the "calculated risks" others are willing to take with their health.

Close the nuclear plants and insist on the safest possible clean-up of the current TMI mess, as well as all nuclear plants, regardless of the dollar costs. We cannot afford them, healthwise or dollarwise.

Sincerely,



DOCKET NUMBER 50-289
PROD. & UTIL. FAC.

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USNRC
MAR 18 1981
Office of the Secretary
Docketing & Service
Branch

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DOCKET NUMBER
PROD. & UTIL. FAC... 50-289

10 Bird Road
Middletown, PA 17057

This is written in opposition to the reopening of Three Mile Island Unit I. I share the feeling of helplessness of many of my friends and neighbors, that we cannot stop a potentially disastrous accident as the result of the ineffectiveness of the operators of the facility. While it is true that the probability of an accident is small the magnitude of an accident could be substantial. Unless the individual who would share the actions of an accident, can be full partners in a referendum, in deciding the operation of TMI-I, it should stay closed.

David Braitman

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DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

R. D. #5
York, PA 17402
March 5, 1981

Ivan W. Smith, Chairman
Atomic Safety & Licensing Board Panel
TMI-Restart Proceeding
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

In re: Docket No. 50-289 (Restart)

Dear Sir:

Unit 1 at Three Mile Island should remain closed!

It is time to enforce the regulations pertaining to nuclear power plants. By refusing to allow TMI Unit 1 to restart, all licensees will know that they are not exempt from having their licenses to operate revoked. Incompetence and mismanagement is no excuse. Let that be one of the "lessons learned" by the nuclear industry.

Met-Ed (GPU) did mislead the public as to the severity of the accident, and there is no reason to believe that they would not do it again. In order to protect their investment they must downplay any accident, no matter how serious. We should not be subjected to the risk of another accident by the same people who brought us the disaster on March 28, 1979.

We now have a severely damaged reactor and an unanticipated amount of nuclear waste in our area, along with an idling, fully fueled reactor. During the cleanup (with an admitted possibility of a serious accident) it is not a good policy to have the fuel in Unit 1. The fuel MUST be removed from Unit 1 while it is still possible to remove it safely.

The people living in the area surrounding TMI will be subject to unknown hazards during the long and complicated cleanup of Unit 2. Also, the radioactive wastes stored on TMI are an ever present threat to the health and safety of the people living nearby.

The accident has been a very horrible experience for myself and my family, as well as for our friends and neighbors. Allowing the restart of Unit 1 will make the stress more prevalent among the knowledgeable people in this area.

As of this day, I have heard nothing about a solution to the many problems of the impractical evacuation plan.

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Many people are saying that the Atomic Safety and Licensing Board will allow TMI Unit 1 to restart regardless of the problems involved. The promises of Met-Ed (GPU) mean nothing, as has been seen by their previous actions.

I hope you will consider my opinion because it is backed by a great deal of study on the matter. Three Mile Island has been a financial disaster for all, and the biological effects will show up in the future.

Sincerely,

Alice A. Herman

cc: Dr. Walter H. Jordan
cc: Dr. Linda W. Little

W S J Fri. Feb. 13, 1981 p. 4

Federal Assistance for Three Mile Island Is Backed by Nuclear Panel, Congressmen

By JOHN R. EMSHWILLER
Staff Reporter of THE WALL STREET JOURNAL

Efforts to secure federal help in financing the clean-up of the damaged Three Mile Island nuclear power plant are gaining momentum.

A presidential committee on nuclear safety delivered a letter yesterday to President Reagan recommending direct federal aid that could total hundreds of millions of dollars and a like amount of aid in the form of a federal loan or loan guarantee.

At the same time, some Congressmen are drafting a bill to create a quasi-federal insurance company that would pay for a large part of the clean-up by charging other utilities with nuclear plants a total of at least $150 million annually in insurance premiums. Those charges probably would be passed on to the customers of those utilities.

The two actions are part of a growing movement to deal with the enormously costly, complex and potentially dangerous problems posed by the contaminated reactor near Harrisburg, Pa. The plant has been closed since a severe accident in 1979. Subsequent clean-up efforts have moved slowly, plagued by technical problems and escalating costs. Current estimates put the cost of the clean-up at $1 billion, although some observers believe the final price tag could be much higher.

Spending by GPU

So far, federal money hasn't been used. General Public Utilities Corp., the plant's owner, has $300 million in private insurance coverage for the plant and estimates it has spent about half. The remaining $150 million could finance operations at a scaled-back level until the end of next year, GPU said.

When the insurance money runs out, it isn't clear who will pay for the decontamination. GPU, which has been pushed to the brink of insolvency by the accident, says it doesn't have the money to do it. Utility regulators in Pennsylvania and New Jersey, where GPU operates, contend the ratepayers shouldn't bear the costs. Attempts have been made to convince other utilities with nuclear plants to help, but so far none has volunteered.

Pressure is building to find some solution. As safety equipment within the facility deteriorates, the risks of new radiation releases increase.

Thus, parties involved in the mishap have turned their efforts to winning federal financial help. Political leaders in Pennsylvania and New Jersey have backed the idea of federal aid. GPU recently hired Thomas L. Ashley, an influential former Congressman from Ohio, to help fashion an aid package. GPU also is seeking $4 billion in damages from the federal Nuclear Regulatory Commission, alleging that better government supervision would have prevented the accident. The claim was filed, but the agency hasn't yet responded.

Committee's Recommendation

The recommendation by the Nuclear Safety Oversight Committee, could be influential because of the panel's status as a relatively independent participant in the cleanup question. The committee, chaired by Arizona Gov. Bruce Babbitt, was created by President Carter as a result of the Three Mile Island accident.

The call for federal aid was backed unanimously by the four-member committee, said an aide to Governor Babbitt. The committee recommended that the federal government provide "direct support" for half of the uninsured cleanup costs at Three Mile Island and loans or loan guarantees for the other half. The loans would be repaid with interest by GPU customers. However, the committee's letter added that the precise mixture of direct aid and loans should be secondary "to the compelling need to provide financing for an expedited cleanup."

The committee also said GPU should retain primary responsibility for managing the cleanup. However, high-level radioactive wastes at the site should "promptly" be removed to a federal repository, the committee added. This action could require additional congressional funding, the group said.

The draft bill for a new insurance fund was put together by Rep. Allen Ertel, (D., Pa.) whose district includes Three Mile Island. He heads an ad hoc delegation of Pennsylvania Congressmen who have been looking into ways to pay for the cleanup.

The proposed insurance company would be empowered to pay 75% of the otherwise insured costs of cleaning up any future accident at a nuclear plant, after the first $50 million. The Three Mile Island accident would be included under the coverage.

To fund the insurance plan, each utility with an operating reactor would be compelled to subscribe to the coverage or have its federal nuclear operating license revoked. An aide to Rep. Ertel said premiums would be based on the amount of nuclear capacity a utility operates. The aim would be to raise a minimum of $150 million a year nationally. In the first several years, much of the premium money would likely go to cleaning up Three Mile Island.

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Wall Street Journal
Thurs. March 5, 1981

P. 23

Letters to the Editor

Three Mile Island: Who Gets the Bill?

Recently, the Nuclear Safety Oversight Committee, chaired by Arizona Governor Bruce Babbitt, recommended to the President that the federal government incur all financial liability for cleaning the crippled reactor at Three Mile Island (TMI). This call—echoed by the Pennsylvania Public Utilities Commission and General Public Utilities (GPU)—proposes a raid on the federal Treasury amounting to approximately $1.2 billion. The assertion is that the government should pay clean-up costs solely on the basis of its long-standing association with the nuclear industry.

The federal government, the argument goes, sponsors nuclear research, promotes nuclear power, regulates the siting and design of nuclear power plants, licenses their operators and even approves and audits their plant procedure. Given this pervasive involvement, the Pennsylvania utilities commission and the utility think the federal government should clean up the nation's worst nuclear accident.

The state regulators and the utility allege the government is legally responsible because of its promotional and regulatory "involvement" with the industry—a kind of bill by association. If this "involvement" approach is accepted, taxpayers should prepare themselves for substantial payments to a diverse array of possible victims, whose only factual claim is that they had the good fortune to keep the bad company of the federal government.

Despite the undeniably large government role in the air transport industry, for example, no one has ever prevailed upon the federal government to pick up the tab for an airline crash without first proving that the accident resulted from a specific failure by the government.

Any monetary assistance to GPU from the federal government must rest on a solid policy basis rather than this makeshift, albeit ingenious, argument. The federal government did not decide to build the Three Mile Island reactor. It did not choose the site, the reactor or the operator. Rather, the government established minimum standards that the utility met in developing TMI. Federal standards sought to ensure the safety of the general public. The legislative intent was not to establish a casualty property insurance system to protect the utility from its own managerial decisions. Surely the utility recognized as much when it took out a casualty insurance policy of $300 million for its reactor.

Does there exist then a policy for federal aid to GPU? One could reasonably argue that in meeting its responsibilities for public health and safety, the federal government should help pay the billion-dollar clean-up costs. GPU cannot meet these costs on its own and, without federal help, the public safety will continue to be jeopardized by the still-contaminated reactor. One might also argue that the government retains its interest in the development of nuclear power and that a clean-up at Three Mile Island is necessary to the future of the nuclear option. It is on these and other relevant points that the federal role at TMI should be argued. There is no shortage of specious arguments to divert us from this critical debate, but we soon will be short of both time and patience.

ALLEN E. ERTEL (D., Pa.)
U.S. House of Representatives
Washington

Mr. Ertel is chairman of the Congressional Ad Hoc Task Force on Three Mile Island.

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5 of 1

BARRON'S
TIONAL BUSINESS AND FINANCIAL WEEKLY JANUARY 5, 1981

China Syndrome?

Only for the Owners of General Public Utilities

THE CAFETERIA of General Public Utilities Corp. (GPU) is no run-of-the-mill, chrome-and-plastic company eatery. Quite the contrary. It is handsomely decked out with butcher block tables and Breuer chairs. Employes looking up from five-sided lunch trays gaze through over-sized windows at the rural countryside which surrounds their headquarters in northwestern New Jersey.

The striking contrast between the spiffy dining room and the holding company's drab future understandably bothers GPU Chairman William G. Kuhns, for according to a $700,000 analysis of GPU's prospects, the company may be the "first major utility since the Depression to go bankrupt." "The building was just about completed when we had the accident." Kuhns comments almost apologetically. "We didn't like the idea of moving into a new building when it looked like we might go bust, but we filled the room."

Talk of bankruptcy for the company, which owns the crippled Three Mile Island nuclear reactor and three electric companies, has subsided. Two studies — the aforementioned $700,000 Theodore Barry & Associates reports and a $500,000 study conducted by the Arthur D. Little Co., concluded bankruptcy wouldn't solve GPU's problems and could make things worse.

Agree to Disagree

Indeed, everyone responsible for the future of GPU and its electric companies, which provide service to 1.6 million homes in Pennsylvania and New Jersey, agrees bankruptcy is not the answer. That is the only thing they agree on.

Where does salvation lie for GPU? The state regulators point to the federal government; members of Congress, for their part, point to the states and the nuclear industry; and, without exception, officialdom thinks the onus belongs on GPU stockholders, ratepayers and management. GPU stockholders, ratepayers and management point to the federal government. Each concedes it needs help from the other and that something must be done. But as New Jersey Board of Public Utilities Commissioner Edward H. Hynes notes: "There is just no machinery in place now to bring us all together."

What GPU needs is clear, even if how that need is to be satisfied isn't. It requires about $1 billion to cleanup the TMI II nuclear reactor in Middletown, Pa., and another $2.3 billion through 1985 to maintain service to its electric customers. It also must raise $400 million to refinance existing maturing securities within five years. GPU officials told a House committee probing its problems that the company will not be able to meet those costs on its own.

"GPU and its operating companies don't have available any source of funds to pay the cost of the clean-up without seriously interfering with the requirement of serving the electric system," company officials testified in November. "Just to provide funds needed to assure minimal service at the level of rates the system has been experiencing, $700 million to $800 million of capital from new investors will be needed. Every dollar of clean-up expense would have to be added to this."

GPU's financial reports, however, aren't terribly attractive to investors. Operating revenues before expenses through Sept. 30, 1980 were $1.36 billion compared with $1.10 billion for the first nine months of 1979. But net income was $19.1 million compared to $81.2 million the year before. And GPU earnings per average share were 31 cents for the first three quarters of 1980, compared to $1.33. Company officials said they have prepared revenue projections for 1981 for internal review, but declined to make the figures public. "So much depends" on the regulatory response to our situation," one official said.

The company's bonds are now rated at below investment-grade quality. GPU stock, which was trading at $18 a share before the accident and paying $1.80 annually in dividends, now sells for $5 and has not paid a dividend for four consecutive quarters.

Since the Three Mile Island accident March 28, 1979, GPU has cut its workforce, scrapped three construction projects which would have cost $2 billion and begun searching for sources of revenue. The company is looking for "research and development" money to clean up the reactor, a job which is expected to last until 1987. It has asked the nuclear industry for help and has petitioned the New Jersey and Pennsylvania utility commissions for rate hikes. GPU also has filed a $1 billion negligence claim against the U.S. Nuclear Regulatory Commission (NRC) and launched a $750 million negligence lawsuit against Babcock & Wilcox, which built the reactor.

Meanwhile, the company is leaning heavily on a revolving credit agreement with a consortium of 45 banks. The arrangement extends up to $292 million in credit to GPU as a whole with limits set at specific levels for the three operating companies. The loans are secured, in part, by the uranium GPU uses in its nuclear reactors and are reviewed every six months.

The company and New Jersey and Pennsylvania utility commissions are banking on federal assistance, either with Uncle Sam's cooperation or via

Continued on Page 20

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CHINA SYNDROME?

a court mandate growing out of the negligence suit GPU charges that the NRC failed to warn the utility of an incident at the Davis-Besse nuclear plant in Toledo 18 months before the TMI accident. As at Three Mile Island, a valve at the Toledo unit failed to close, allowing vital cooling water to bleed out of the reactor. Unlike at TMI, however, no damage was inflicted on the reactor, also built by B&W, because the facility was operating only at 7% of capacity and operations were soon resumed.

When trouble struck, TMI was operating at 97% of capacity and the lack of cooling water resulted in the plant's core overheating to the point where the fuel rods were badly damaged and released radioactive particles in the process contaminating the containment building. The NRC probed the Davis-Besse incident, but GPU claims that neither it, nor its operating companies, were informed of the Commission's findings. "If a proper warning had been given by the NRC, the TMI accident would have been avoided," GPU contends. Besides seeking the cost of the clean-up, the $4 billion claim asks for damages to cover restoration of the unit to service, replacement power, lost revenues associated with the New Jersey and Pennsylvania decisions to remove the reactor from rate bases and interest costs.

Kuhns stresses that the lawsuit is not frivolous, but a "damn good one." Donald Winston of the Atomic Industrial Forum, a lobbying group for the nuclear industry, observes that a successful lawsuit will have the same result as a federal grant. "Ultimately, the money will come out of the same pocket," Winston says. "It's an attempt by GPU to spread out the costs of the accident over the entire population."

Hat in Hand

While suing the government, GPU is also politely requesting federal grants. Company officials, joined by state regulators, point to the health and safety problems posed by the reactor as one factor justifying federal help. Too, they argue, Washington's strong advocacy of the commercial development of nuclear energy mandates federal intervention. They add that government assistance to troubled companies is not unknown. However, federal legislators, even those representing districts served by GPU companies, have been reluctant to support the plea.

"I just don't know if we can continue to aid companies that get into trouble," comments U.S. Rep. Millicent Fenwick (R., N.J.), whose district contains hundreds of thousands of GPU's Jersey Central Power & Light Co. customers. "They have cut their dividend, reduced top officers' salaries and come up with cheaper replacement power, and that's very good and very commendable. But my inclination is to be very leery of federal intervention."

Rep. Allen L. Ertel (D., Pa.), whose district includes TMI II, dismisses out of hand the argument that the government bears a responsibility because of its role in promoting nuclear energy. "With the exception of Orville and Wilbur Wright, the United States government has been the strongest proponent of aviation the world has ever seen," Ertel points out. "Yet, each time a DC-10 goes down, you don't see the federal government rushing in with a checkbook."

But to equate GPU with Chrysler or Lockheed or any other non-regulated industry is to miss the point, according to Pennsylvania's Consumer Advocate Walter W. Cohen. "If a DC-10 goes down, the airline can recoup the loss through higher rates and you can always fly another airline," Cohen explains. "Chrysler is going to pay back its loan through higher prices on its cars, but you don't have to buy a Chrysler Corp. automobile. It isn't that way for customers of Metropolitan Edison (Met Ed), and Pennsylvania Electric Co. (Penelec) here in Pennsylvania or for customers of Jersey Central. They don't have a choice."

Ertel, who is chairing a House sub-committee investigation on the Three Mile Island accident and its consequences, holds that there is no precedent for a grant, but adds he may be able to convince his fellow legislators to fund some kind of partial loan program. The difference between what the loans provide and GPU needs, he feels, must come from the nuclear industry and the states.

Both Cohen and Alfred L. Nardelli, the New Jersey deputy public advocate who's monitoring the JCP&L situation, insist that federal intervention must take grant form. They argue that loans would place a greater burden on ratepayers, who would be forced to absorb the financing charges. Further, they aver, since the loans need to be repaid, GPU's long-range circumstances would not be helped.

No Response

Cohen and Nardelli joined with Ertel in calling for aid from the nuclear industry, but so far there has been no response. The Atomic Industrial Forum, which serves as an industry spokesman, and the association of electric companies known as the Edison Electric Institute have taken no position on help for GPU. General Public Utilities has suggested that all electric companies impose what would amount to a 2-mills-a-month surcharge on the average residential customer, which would generate $100 million annually that could be given to the company. Industry officials are skeptical of the idea.

New Jersey Energy Commissioner Joel R. Jacobson is incensed by the industry's position. Jacobson calls the industry's response "cosmetic concern, coupled with calculated indifference. It's time for them to show some statesmanship. The industry just can't expect the regulatory commissions to handle this thing alone." The regulators agree, saying that they can't ask the customers of JCP&L, Met Ed and Penelec to shoulder much more of the financial burden of the accident.

GPU's 1.6 million customers now pay $24 million each month to purchase replacement power. Since Three Mile Island, customers of the three electric companies have suffered, on average, 34% jumps in their bills, more than half of the increases stemming from the accident.

Angry customers — some of whom are retirees who had planned to use their GPU dividend checks to pay their GPU company electric bills — have flooded both commissions with angry letters each time they approve a boost. New Jersey Commissioner Hynes notes that he has been forced to vote for six increases for JCP&L since the accident; the hike in May forestalled bankruptcy. Hynes insists that he isn't trying to step out from under responsibility when he suggests the federal government play a large role in GPU's future.

"Who is responsible for TMI? Ed Hynes is not," the Commissioner says. "We don't

China Syndrome?

want to lay the entire burden at the feet of the federal government, but look at the record. The preamble to the Atomic Energy Commission, the forerunner of the NRC, says its purpose is to promote nuclear energy. The federal government subsidized it through research programs, licenses it and promotes it as a way of reducing our dependence on foreign oil." A U.S. Department of Energy report shows that the U.S. has shelled out over $37 billion in subsidies to foster the growth of nuclear power over the last 30 years.

To date, GPU customers have paid not one red cent for any of the TMI clean-up. The work is being funded by $300 million in insurance (the maximum available) carried by General Public Utilities. New Jersey has yet to decide if it will allow JCP&L customers to absorb any of the clean-up costs. Since JCP&L owns a 25% share of TMI, its loss could run to $175 million. Pennsylvania's two GPU companies own the remaining 75% and that state's Public Utility Commission has flatly ruled out forcing customers to bear any of the financial burden of the clean-up.

"We have said that, but we have also said we have no intention of letting Metropolitan Edison or Penelec go into bankruptcy through the result of the action, or lack of action, we take," notes Pennsylvania Public Utility Commission President Susan M. Shanamon. That view is shared by others responsible for GPU's future. Federal officials, who publicly balk at providing aid for GPU, confide privately that it would be "totally irresponsible" to let the company go under and pledge that it will not happen.

At Odds

But the interested parties are at odds on what form the aid will take or when it will come. On the latter score, there are two key dates. The first is when the NRC allows TMI 1 to return to service. TMI 1 was out of service for regularly scheduled refueling and maintenance when the accident befell its twin. TMI 1 was not involved in the accident, nor was it damaged. Since then, pending hearings and tests, the NRC has kept the unit shut down. As a result, the Pennsylvania and New Jersey commissions have taken TMI 1 out of rate base, a decision which is being challenged in the courts of both states and is costing GPU millions of dollars each month.

Both commissions have indicated that they will return TMI 1 to rate base as soon as the NRC shows signs of bringing the unit back on stream. "Without TMI 1 back in base rates soon, GPU goes under," declared New Jersey Deputy Public Advocate Nardelli. "But the real crunch comes in early 1982, when the insurance money runs out."

But even in that regard, everything isn't cut and dried. Last summer, GPU slowed down clean-up work at TMI II, delaying by two years the earliest possible date the unit could return to service, but stretching out the insurance money.

Unless the banks decide not to renew the loans, in which case GPU's problems come quickly to a head. Kuhns thinks the pivotal date for his company will be sometime in 1982. "We have to have a clean-up funding program in place by then," Kuhns states. "We are not asking for replacement power costs or to restore the dividends we lost, that will come from our lawsuits. We are certainly not trying to make money on this. If people see this as a bailout, I can relate to that. I don't think government is there to do that. But I urge people to think about what happened to us. We had the industry's accident, the one that was inevitable, according to the President's commission which investigated the accident. I don't want people to read anything ominous into this, but I don't think we have had the last accident."

Kuhns believes a utility is not to be confused with an unregulated business. "In the free enterprise system, you make a bad umbrella, you go broke; it's that simple," he says. "But it's not the same with a utility. Regulations impose limitations on risks and limitations on stockholders. We get the same rate of return on a light bulb as we do on a nuclear plant. You can change all the rules and have the shareholders bear all the risk. But if you do, you have to let them enjoy all the benefits. Otherwise, you won't get anyone to invest a dime in a utility." ■

THE POWER LINE

Environmental Action Foundation

Vol. 6, No. 4, November 1980

GPU On the Ropes

Soaring TMI Cleanup Bill Deepens Company's Financial Crisis

Time is running out for General Public Utilities. A year and a half after the accident at Three Mile Island, the nation's fourteenth-largest investor-owned electric utility confronts a steadily worsening financial crisis.

The decontamination of the damaged TMI-2 reactor is plagued with technical and political uncertainties, and the price tag for the 5- to 7-year operation has recently increased to $855 million—a figure substantially above the plant's original construction cost.

TMI-1, the undamaged reactor at the site, is shut down indefinitely, pending a Nuclear Regulatory Commission decision on whether GPU is qualified to reopen and operate the plant.

The New Jersey and Pennsylvania utility commissions have let GPU's three operating subsidiaries raise rates by hundreds of millions of dollars to pay for replacement power, but the commissions have also excluded both TMI-1 and TMI-2 from the companies' rate bases. That reduces GPU's net earnings by some $85 million a year.

The price of GPU stock, meanwhile, has fallen from $18 to $5 a share since the accident, representing a loss for the company's stockholders (on paper) of $775 million.

The company will also soon reach the limits of the line of short-term credit extended to it by a consortium of banks. It has virtually no chance of obtaining access to capital markets in the near future.

GPU has therefore slashed its construction program, deferring the planned Forked River nuclear projects (among others) indefinitely. It's eliminated its dividend to stockholders. And the company recently suffered its first quarterly loss in history.

The bottom line to this unrelenting tale of financial woe is bluntly suggested by a recent management audit commissioned by the Pennsylvania PUC. "GPU is now a candidate to be the first major utility to go bankrupt since the Depression."

The utility, of course, is struggling to avoid that fate. It's pressing to reopen TMI-1 and contesting the assertions of intervenors in the NRC proceedings who say GPU, given its past record, is not managerially fit to operate nuclear plants.

(Ironically, to grant an operating license for TMI-1, the NRC must find GPU to be *financially* fit, as well.)

Company subsidiaries have filed for a total of $317 million in rate-base increases before the New Jersey and Pennsylvania commissions. And GPU has sued Babcock and Wilcox, builder of the crippled TMI-2 reactor, for $500 million in damages for B&W's alleged role in the accident.

But financial recovery won't be easy. Even if GPU can restart TMI-1 and again earn a return on it, and even if the company wins substantial new rate increases, there remains the small matter of the bill for the ongoing cleanup at TMI-2.

This issue has moved to center stage following recent PUC actions in Pennsylvania. In an order denying $45 million in emergency rate relief to Metropolitan Edison Co., a GPU subsidiary, the four PUC commissioners restated their position that "cleanup costs and expenditures not covered by insurance ultimately are the responsibility of the Company's stockholders and/or the federal government; however, they are not the responsibility of ratepayers."

That statement reflects the commissioners' belief that these costs are not proper operating expenses. It also reflects the political facts of life. As Commissioner James Hawley told the press, "There's no way we can pass along $1 billion in cleanup costs to ratepayers. They'd shoot before that happens."

GPU has responded to the PUC's actions with a court challenge and with a series of actions designed to conserve cash, including the layoff of 700 workers, 500 of them at the TMI site.

Cleanup costs didn't seem such a crucial issue, of course, when everyone thought GPU's $300 million in property insurance on the facility would cover most of the expense. But the latest cost estimates, and the likelihood that even they are too low, have changed the stakes.

Now, if GPU's ratepayers are insulated from these costs, the money must come

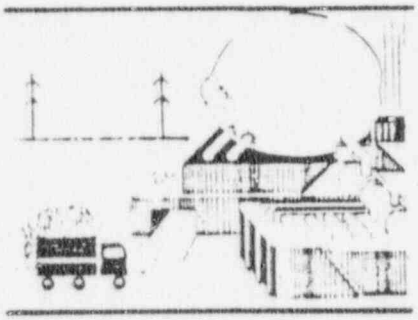
from a limited number of alternative sources.

One obvious place to turn is Washington. PUC chair Susan Shanaman, calling for direct federal assistance in the cleanup, points out that "in terms of hard, cold economics, the TMI accident is as disastrous to thousands upon thousands of Pennsylvanians as are an ash-belching volcano, a hurricane-spawned flood, or a floundering company."

GPU president Herman Dieckamp, in a letter to the Pennsylvania congressional delegation, has argued that "the accident at Three Mile Island has become a national learning experience in the evolution of development of nuclear energy . . . It is clear that the entire nation will benefit [sic] as a result of our misfortune. We believe that equity requires an appropriate mechanism for spreading this impact over those who will benefit from the experience."

Dieckamp went on to call for financial assistance from government and/or the nuclear industry.

Pennsylvania's congressional delegation has already established a task force to look into federal assistance for the cleanup process, whether through grants, loans, or loan guarantees.



The Edison Electric Institute has also formed a task force to examine "all options regarding a national response to the lessons of the TMI accident."

Presumably included among these options is GPU's infamous proposal that all ratepayers of nuclear utilities contribute to TMI-2's cleanup costs directly through their bills, a notion which has found little favor, even among the nation's utility executives.

Any proposed GPU bailout by either the federal government or customers of other utilities clearly faces political obstacles which could prove insurmountable. But the company and its allies will no doubt press on.

As a consultant to the Pennsylvania PUC put it, "If GPU is not allowed to recover cleanup costs through rates, and if the federal government does not offer financial assistance, then bankruptcy or a reorganization is probably both imminent and certain."

Many unknowns complicate the task of predicting what might happen in the event of a GPU default. Bankruptcy, after all, is a totally unfamiliar experience for today's electric utilities. However, two things seem clear: electric service would continue for GPU customers, and there would be a lot of litigation.

Quantifying the impact of a bankruptcy on rates is difficult. But a recent consultant's report prepared for the New Jersey utility commission estimated that GPU's New Jersey customers might face an increase of $190-815 million in rates over ten years as the result of such an event.

"Bankruptcy appears to offer no economic advantages to ratepayers and introduces additional risk of higher costs of litigation, capital, and replacement power," the report's authors argue.

However, they admit, "It is not our purpose to discuss issues of equity, potential fault, and public policy. Resolution of such issues may be necessary to the evaluation of the advisability of bankruptcy."

An internal study recently completed by the Pennsylvania PUC's Chief Counsel Joseph Malatesta also concludes that bankruptcy would not be to anyone's advantage, mainly because its results are so unpredictable.

Whether or not these studies accurately assess the benefits and disadvantages of a GPU bankruptcy may be debatable.

However, it's clearly the commissioners' perceptions of bankruptcy's consequences which are important. For the present, both commissions seem firmly committed to preventing a GPU default.

A possible alternative to bankruptcy would be some form of planned reorganization. Under one scenario, GPU would sell its operating subsidiaries to other utilities, without selling them the actual TMI units.

The GPU holding company would then be left with the TMI plants, the cash from the sale – and no customers or revenues. It would use the cash to decontaminate TMI-2, and then reopen or decommission the two units. All of this, needless to say, is very speculative at this point.

These massive uncertainties place the NRC in an uncomfortable position. Following the Pennsylvania PUC's denial of emergency rate relief to GPU, and the company's subsequent layoff of workers, the NRC felt compelled to issue a policy statement warning all parties that "all of our health, safety, and environmental requirements applicable to TMI-1 must be fully complied with . . . NRC requirements must supersede state agency requirements that result in a lesser degree of protection to the public."

But GPU's deteriorating financial condition, and the impact it's having on the TMI-2 cleanup process, obviously increase the pressures on the NRC to allow the company to reopen TMI-1. The commission will make that decision within the next several months.

Meanwhile, the New Jersey and Pennsylvania utility commissions continue to consider GPU's requests for higher rates, with decisions unlikely before next March or April.

At least one observer close to the regulatory process doesn't think the company will make it that long. He says that without immediate rate hikes, further cuts in the TMI cleanup process (which the NRC is unlikely to allow), or cuts in normal electric service (which the utility commissions probably won't allow), the company will go broke as early as December.

The observer, who for obvious reasons must go unnamed, believes the utility commissioners still don't understand the full scope of the problem, as evidenced by the giant game of "chicken" they seem to be playing with Washington in a bid for financial aid. Part of the commissioners' confusion, he feels, may be due to the slow-motion nature of GPU's financial dissolution.

"It's like a dinosaur dying," he remarks. "It takes a long time to hit the ground."

—Alden Meyer

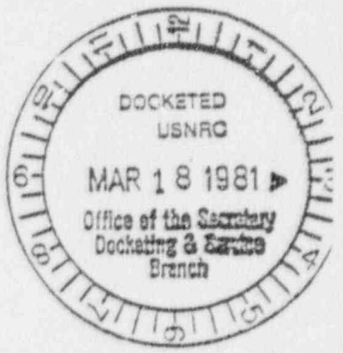
pp 1, 6+7.

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

New Hampshire Clamshell
c/o Great Bay Clamshell
Box 110
Durham, New Hampshire 03824

RECEIVED
'81 MAR 12 P2:56

March 9, 1981



Atomic Safety and Licensing Board
Ivan W. Smith, Chairman
Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Docket No. 50-289 (Three Mile Island, Unit I RESTART)

Dear Sir:

Thank you for the NOTICE of a proceeding on this matter scheduled for March 5, 1981. We request this written statement be included in the record.

Because we here in New Hampshire live near two active nuclear fueled generating stations (Yankee Atomic at Rowe, Mass. and Vermont Yankee at Vernon, Vt.) and a third facility under construction (Seabrook Station at Seabrook, N.H.), we watch the ongoing series of events at Three Mile Island with great interest. We watch the events sequential to and consequential of the accident of March 1979, with ever increasing apprehension. We find our basic concerns for issues of health and safety are being brought into ever more clear focus as time goes on. Now, added to those concerns, financial and jurisdictional factors are creating a chaotic monster which shows prospect of involving every participant in the Industry and maybe every federal tax payer or every electric utility ratepayer. (see enclosures)

To RESTART TMI Unit I before the pressing generic problems now being experienced by General Public Utilities are resolved would be completely irresponsible.

DS03
3/0

The three generic problems that appear to be most pressing at this juncture are:

1. HOW is the waste material from TMI Unit II going to be processed and stored?
   WHERE is the waste material from TMI Unit II going to be processed and stored?

TMI Unit II brings these questions to the forefront, but they must be answered in terms of all nuclear fueled facilities.

2. What is to be the PROCESS of decommissioning?
   How are the COSTS of decommissioning going to be structured into utility rates?

The experience of TMI Unit II highlights this problem, but it too must be answered in terms of all nuclear fueled facilities.

3. How are the FINANCIAL responsibilities resulting from the accident at TMI Unit II going to be allocated?
   WHO is to make the decision?

It must be recognized that although the accident at TMI Unit II is the most extensive and expensive accident so far, it will not be the only one.

TMI Unit II can serve as a mixed blessing in that valuable lessons can be learned. Decisions about TMI Units I and II will become precedents for the Industry.

It is the conviction of members of the New Hampshire Clamshell that the multiple risks of nuclear fuel outweigh the benefits. RESTART of TMI Unit I, as designed, is not justified.

Please give our concerns your thoughtful attention. Thank you.

Prepared for New Hampshire Clamshell by New Hampshire Clamshell
Mary K. Metcalf
Mary K. Metcalf

Easton Area CHAMBER OF COMMERCE

MEMBER CHAMBER OF COMMERCE OF U. S. A. PENNA. STATE CHAMBER OF COMMERCE
INCORPORATED 1893

157 SOUTH FOURTH ST.
EASTON, PA. 18042
TELEPHONE 253-4211
AREA CODE 215

March 5, 1981

TO: Atomic Safety and Licensing Board

FROM: Easton Area Chamber of Commerce

SUBJECT: Re-start of Three Mile Island Unit # 1

The Greater Easton Area is an integral part of the Lehigh Valley, Pennsylvania's third largest metropolitan area. We have a diverse economic base, consisting of a broad spectrum of large and small manufacturers, commercial enterprises, and a growing number of service businesses, which has allowed the area economy to overcome many problems. As the largest organization of business and industry in eastern Northampton County, the Easton Area Chamber of Commerce has long been concerned about the long and short range economic impacts of the accident at Three Mile Island.

Having conducted what we believe to be a thorough study of the issues involved in this matter, we ask for your assistance in returning Three Mile Island Unit # 1 to service as soon as is humanly possible.

We hasten to say that we do not want to have Unit # 1 started until it has been determined to be safe; any other position would be reckless. However, as is commonly known, there are at least seven other Babcock & Wilcox generating facilities, virtually identical to Unit # 1 currently in service. There have, of course, been some modifications made on these units, but the same modifications are being made on Unit # 1 and it is our understanding that they can be completed in the short term. I do not believe that safety is the primary consideration which is delaying the restart, rather I perceive it to be the potential political ramifications of the decision. If seven other units are in operation, the safety question, at least to the parties responsible for the decision, should be academic.

DS03
1 of 1

The economic impact that the idleness of Unit # 1 is having on our area is negative and serious. We have attached a table which accurately portrays the magnitude of the price increases which have been imposed on customers in our area since the 1979 accident. You will note that the table also indicates the relief that can be expected when Unit # 1 is returned to service. The cost of electrical energy is a substantial part of the cost of doing business. For some of our heavy industries it represents a very large portion of their total operating expenses. When a company experiences cost increases on the order of 43% - 86%, you must anticipate a debilitating effect on the business and upon the area economy.

The impacts of the seemingly never ending price increases have been manifold. Existing jobs are trheatened, and the development of new jobs has slowed substantially. The increases in price have hampered the construction industry, already experiencing severe problems. this is evidenced by the far greater amount of construction being undertaken in areas contiguous to ours but being served by Pennsylvania Power & Light. In a survey of area businesses, almost all indicated that the chances for expansion in our area were very much limited by the cost of electricity. Our own program for industrial development is at a serious competitive disadvantage when compared to those communities served by lower cost providers.

It has been said that the economic factors should not receive primary consideration in those deliberations. The economic factors are people factors, they are emotional factors. I submit that unemployment and less spendable income are severe problems which affect people. Further, it is not only business which is experiencing distress with regard to ever rising costs. Local governments, schools, hospitals, county and state facilities are all experiencing these higher costs. Who pays the increases? The people pay. The people pay at home, and they pay in their taxes, and they may pay through the loss of jobs. It is the people who always pay.

It is very exasperating to read a commentary indicating that the economic impact of Three Mile Island has not been significant because the Metropolitan Edison rates are not the highest in the Commonwealth, not the highest in the surrounding states. That type of reasoning simply does not address the realities of the market place. Every business, indeed every individual, plans the financial future upon a number of factors, factors which we believe are relatively stable or at the least predictable. A company prices a product based upon anticipated costs. When any one of these costs, be it energy, labor, materials, or interest rises sharply and uncontrollably, the financial plan is in crisis. Much of the same can be said for the budgets of our residential consumers. Our businesses, therefore our people, are at a competitive disadvantage because their competitors, most all of which exist outside of the region and state, have not received similar increases in their cost of electrical power.

We believe that it is absolutely essential to bring TMI Unit # 1 back into service as soon as possible. Immediate relief is required, and the 8% - 9% decrease in price that Unit # 1 would provide is of great importance. Insofar as it has been determined by the Nuclear Regulatory commission that the Babcock & Wilcox design is safe, we see no reason for further delay.

Cost Increases to
Metropolitan Edison customers:

	Average Rates			Estimate Rates with TMI 1 back in service	
	Jan. 1979	Jan. 1981	% Increase	Rate	% Decrease
Residential without water heat (500 kwh)	$25.79/mo.	$34.84/mo.	35%	32.21	7.6%
Residential with water heat (750 kwh)	$31.80/mo.	$46.30/mo.	46%	42.25	8.8%
Small Commercial	4.42¢/kwh	6.33¢/kwh	43%	5.80	8.4%
Large Commercial	3.75¢/kwh	5.74¢/kwh	53%	5.19	9.6%
Industrial	2.47¢/kwh	4.59¢/kwh	86%	4.02	12.4%

Easton Area CHAMBER OF COMMERCE

MEMBER CHAMBER OF COMMERCE OF U. S. A. PENNA. STATE CHAMBER OF COMMERCE
INCORPORATED 1931

157 SOUTH FOURTH ST.
EASTON, PA. 18042
TELEPHONE 253-4211
AREA CODE 215

March 5, 1981

Mr. Ivan Smith
Atomic Safety & Licensing Board
25 North Court Street
Harrisburg, Pa. 17101

Dear Mr. Smith:

Due to the severe snow storm which struck our State on March 5th, I was unable to attend the public hearing concerning the restart of TMI Unit # 1. I am enclosing a copy of the testimony which I was prepared to present that evening and hope that it may be of some use to you in your deliberations.

At the moment we are planning to have representatives at the March 11th meeting and may present our testimony publicly at that time. If there is any change in your anticipated schedule for March 11. please contact this office.

Very truly yours,

J. Michael Dowd
Executive Vice President

JMD/sle

Enclosure

D503
S1/0

3-10-81

Arthur R Burkland
31130 S Gen. Kearney Rd Sp 19
Temecula Ca 92390
March 8 198 1

The Honorable Joseph M Hendrie
U S Nuclear Regulatory Commission
Washington D. C. 20555

Dear Commissioner Hendrie:

Every Utility Co. which has had, or may have in the future disasters (such as THREE MILE ISLAND) must be encouraged and helped in every legal way to get back to producing energy.

Instead they are all being hindered and unjustly penalized at every turn - treated as uncaring and careless criminals. While the noisy, radical groups with their highly organized and well planned opposition are treated as heros by the media.

INEQUITIES CAUSED BY LEVELIZED RATE MAKING MUST BE CORRECTED. Utilities are not allowed to make enough profits to build up reserves to help cover disasters. Rate lag between requests and regulatory decisions are unreasonably long.

WE NEED LEGISLATION AND REGULATORY DECISIONS FOR THE REOPENING OF TMI-1 AND OTHER PLANTS ACROSS THE COUNTRY. We also need to expedite the cleanup of TMI-2.

Please put the country's, the users' the workers' and the stockholders' needs ahead of the clamors of the radicals.

respectfully
Arthur R. Burkland

P05
S1/0

DOCKET NUMBER
PROD. & UTIL. 50-289

1025 Miller Lane
Harrisburg, PA 17110
March 7, 1981

Ivan Smith, Chairman
Atomic Safety & Licensing Board: TMI Unit 1 Restart
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Smith:

We thank the Board members for scheduling a special evening session on Thursday, March 5th, to afford southcentral Pennsylvania residents whose daily work-hours preclude attending the daytime hearings on TMI-1 Restart to present their concerns to you in person.

As you have seen, interest and response was high -- probably moreso than you estimated when scheduling only one evening for testimony. In the three-hour period allotted, if each speaker was kept to a maximum five-minute presentation -- a limitation that has never been successfully enforced in past ASLB hearings -- then an absolute maximum of only 34 witnesses could have appeared (allowing for one 10-minute recess). In fact, the number who appeared was considerably less; and many more -- we were number 52 on the list to address you -- remained to be heard.

It is crucial for your Board's fullest understanding and wisest decision regarding restart of TMI-1 that these citizens be given their right to present their concerns -- pro or con regarding Unit 1 -- face-to-face before the Board, for appreciation of the intensity of residents' concerns about TMI-1 Restart cannot be adequately raised nor sensed through the emotionless nature of written statements.

Therefore it is imperative within the charge given this Board that another evening opportunity for public testimony on an intimate and personal basis be scheduled soon, allowing the many interested and concerned individuals who could not address you on March 5th to do so.

We look forward to your immediate and favorable attention to this request, and to sharing personal revelations about TMI as they directly pertain to operation and public safety at Unit 1.

Remaining

Most sincerely yours,

~Larry E. Arnold.

Larry E. Arnold

cc: Rep. Bruce Smith
Rep. Jeffrey Piccola
U.S. Rep. Allen Ertel
Sen. George Gekas
U.S. Sen. John Heinz III
U.S. Sen. Arlen Specter
Gov. Richard Thornburgh
The PPC Commissioners

DSB 5/1

DOCKET NUMBER 50-289
PROD. & UTIL FAC.

Gladys L Burkland
31130 S Gen. Kearney Rd Sp 19
Temecula Ca 92390
Mar 8 1981

The Honorable Joseph M Hendrie
U S Nuclear Regulatory Commission
Washington D. C. 20555

Dear Commissioner Hendrie:

For the sake of the country's future, WE MUST HAVE LEGISLATION AND UTILITY COMMISSION REGULATORY DECISIONS TO PROTECT THE UTILITIES - WHICH ARE THE VERY LIFE BLOOD OF OUR NATION - FROM THE PREVALLING UNFAIRNESS OF THEIR TREATMENT AND IGNORANCE OF THEIR NEEDS.

Plants which have suffered disasters, or may in the future, must be encouraged and helped in every way to get back to producing much needed energy.

Instead, it seems to me, they are not receiving RAPID, FAIR OR ADEQUATE treatment - while the highly organized, noisy radicals groups with their well planned publicity are treated as heros by the media and they are exerting undo pressure on regulatory agencies. You are our only hope. Hear our pleas.

UTILITIES ARE NOT ALLOWED ENOUGH PROFITS TO BUILD UP RESERVES TO COVER DISASTERS. RATE LAGS BETWEEN REQUESTS AND REGULATORY RESPONSES ARE UNREASONABLY LONG.

PLEASE HELP GET TMI-1 BACK ON STREAM AND IMPLEMENT THE CLEAN UP AT TIM-2 as well as any other plants which have had or may have such disasters.

Respectfully,

Gladys Burkland

DSD
S.1/0

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

STANDARD STEEL
BURNHAM, PA 17009 (717) 248-4911

John E. Fogarty
President

March 10, 1981

Mr. Joseph M. Hendrie, Chairman
Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Hendrie:

Every month the Pennsylvania Electric Company charges their customers an extra $2.5 million to replace power not available from its "undamaged" TMI Unit #1. Why does the Nuclear-Regulatory-Commission not permit TMI #1 to be operated when Penelec claims that TMI #1 conforms to all Regulatory Standards. As one of Penelec's largest customers, we must be vitally concerned about the availability of competitively priced power with which to conduct our business.

In addition, because all Penelec power is derived from coal-fired generating stations, we are concerned about reports that some of these units will soon be taken out-of-service for major maintenance. It is likely, therefore, that even more expensive "purchased-power" will be required.

It is unfortunate, indeed, that deliberations with regard to TMI #1 have dragged on painfully slow. We can only urge that the investigative processes be expedited. We also urge that the astronomical costs associated with TMI #2 be shared by the Federal Government whose NRC agency was substantially involved in the establishment and/or approval of TMI #2's standard-operating-procedures.

Very truly yours,

DS03
S/O

DOCKET NUMBER
PROD. & UTIL FAC. 50-289

[illegible]13 Tulip Hill Rd
Worthington Ohio 43[illegible]
March 9, 1981

Dear Mr. Ahearne —

As a previous staff member of the AEC, and as a citizen committed to the nuclear alternative, I am writing to encourage you and your staff to get on with the restart of TMI-1. Delays have gone beyond what I believe are reasonable and necessary.

Sincerely,

[illegible]

DS03
S1/0

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

DOCKETED
USNRC
MAR 16 1981
Office of the Secretary
Docketing & Service
Branch

March ?/81

Dear Chairman Ahearne,

I am writing to urge you not to support the
re-opening of Unit I at Three Mile Island. The people
around TMI have already suffered enough in the
accident 2 years ago. Also it seems uneconomical
to start Unit I up again since the customers do not
use ~~or need~~ 45% more electricity generated in that
area. I thank you for listening.

Sincerely,

Sharon T. Williams
80 Maple Road
Graterford, PA
19426

DS03
S 0/1

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

March 9, 1981

James Ahearne, Chairman
U.S. NRC
1717 H. St., NW
Washington, D.C. 20555

Dear Mr. Ahearne

I have heard recently that the opening of TMI-1 is being considered.

For many reasons I wish to make it known that I am very much opposed to this reopening nor do I wish to see it operating at 5%.

Without TMI the PJM system is able to supply at least 45% more electricity than all its customers have ever demanded during the winter and last summer it was able to supply 29% more than its customers ever demanded.

I hope you will agree that from the public's point of view this would be a foolish move.

Sincerely,

Marlene Sciole

Marlene Sciole
Box 411
Jamison, Pa. 18929

D503
S/O

RELATED CORRESPONDENCE

DOCKET NUMBER
PROD. & UTIL. FAC. 50-289

PUBLIC INTEREST LAW CENTER OF PHILADELPHIA

CERTIFICATE OF SERVICE

"Testimony of Bruce Molholt, Ph.D., in support of off-site contentions of the Environmental Coalition on Nuclear Power"

I hereby certify that copies of this testimony have been deposited this date

16 March 1981

in U.S. first class mail addressed to all parties in the NRC Atomic Safety and Licensing Board Hearings on the restart of TMI nuclear station, unit 1.

Bruce Molholt

Bruce Molholt, Ph.D.

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TESTIMONY OF BRUCE MOLHOLT, Ph.D. IN SUPPORT OF OFF-SITE CONTENTIONS OF THE ENVIRONMENTAL COALITION ON NUCLEAR POWER

- EP - 7 (ECNP 2 - 8)
- EP - 10 (ECNP 2 - 28)
- EP - 11 (ECNP 2 - 33)

U.S. NUCLEAR REGULATORY COMMISSION

TMI - 1 RESTART HEARINGS (Docket 50 - 289)

Atomic Safety and Licensing Board

HARRISBURG, PENNSYLVANIA

submitted 16 March 1981

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Introduction

This testimony is written in support of three contentions of the Environmental Coalition on Nuclear Power (ECNP). Although I have attempted to accord each contention with the most relevant testimony, in that the topics are related, there is some overlap. Hence, the testimonies should be taken as a whole and not limited to a single contention. To help in this integration, an outline follows.

OUTLINE OF MOLHOLT TESTIMONY

EP-7 (ECNP 2-8)

> The fractions of EPA PAGs listed on p. 4-1 of the Plan, with their associated action levels, do not take into account the total accumulated dose and dose commitment. As a result, the total exposures may exceed by large margins the listed PAG fractions prior to the advancement to a higher emergency category.

The GPU Nuclear Corp. Emergency Plan for Three Mile Island Nuclear Station Unit 1 on p. 4-1 lists the following fractions of Protective Action Guideline dose levels as defined by the Environmental Protection Agency:

	Fraction of PAG
Alert	.01
Site Emergency	.05
General Emergency	.1

with the PAGs referring to 1 rem whole body dose or 5 rem child thyroid dose accumulation whereas the GPU Emergency Plan refers to fractions of PAGs accumulated per hour.

The Emergency Plan goes on further to state (p. 4-6):

> The projected values for dose and dose commitment given as emergency action levels for even the highest class of emergency (i.e. General Emergency) are considerably lower than the EPA PAG's discussed above. Therefore, the declaration of a General Emergency, although an extremely significant event in its own right, should not be construed to mean that the EPA PAG's have, or even will, be exceeded.

The GPU Emergency Plan thus attempts to lull the public into a false sense of security, that they are being protected above and beyond those radiation protection guidelines set by the EPA. In fact, the truth is the opposite. The GPU Emergency Plan misinterprets the sense of the EPA PAGs and bases its "extra measure of public protection" upon this distorted interpretation. Furthermore, in failing to put any potential releases of radionuclides to the public residing near Three Mile Island into the context of the accident at TMI-2, the GPU Emergency Plan overlooks the cumulative nature of radiation-induced carcinogenic and mutagenic damage to the public. I shall address these two issues separately below.

EPA Protective Action Guidelines

The EPA PAGs for the plume exposure pathway are expressed as a range of 1 to 5 rem whole body dose and 5 to 25 rem thyroid dose to individuals in the population. These PAGs ignore any exposures by the ingestion exposure pathway, which have no parallel in 10 CFR 100 guidelines (the PAGs are more conservative regarding human health effects than

comparable 10 CFR 100 guidelines). Depending upon the nature of a given accident, the ingestion pathway may far outweigh the plume pathway in providing the nearby population with radiologic insult. In addition to considering the population predisposition to radiologic damage (next section), I will discuss here two oversights in the PAG approach:

1) The 5 rem thyroid dose for children does not consider the exquisite sensitivity of the fetal thyroid to iodine-131 insult.

2) Exposures far and above those calculated by the NRC may result from even normally operating nuclear stations.

In addition I will discuss as a third point the attitude of the GPU Emergency Plan that " ... declaration of a General Emergency ... should not be construed to mean that the EPA PAG's ... will be exceeded."

1) Fetal thyroid sensitivity to iodine-131

The human fetus develops from one single fertilized cell at conception, the zygote, to over one trillion cells in merely nine months. The rapid division of all fetal tissue cells renders this stage of human development the most sensitive to all forms of genetic damage. Only the fetus is sensitive to teratogenic effects of radiation or chemicals. The fetus is likewise more sensitive than any other stage of human development to carcinogenic or mutagenic insults by radiation or chemicals. Hence, the lower range of PAG guidelines for 1 rem whole body dose will be achieved much more quickly by the fetus than by another other developmental stage of man. Assuming that in general the fetus is ten times as sensitive any stage of childhood development postpartum, the General Emergency provision of the GPU Emergency Plan at 0.1 the EPA PAGs as defined would be equivalent to 100 percent of the PAG whole body dose for the fetus.

The situation is even worse for fetal thyroid sensitivity to iodine-131. The developing fetus, depending upon the stage of gestation, may be 40 times as sensitive to I-131 as any of the childhood stages of thyroid development. Hence, in actuality, the General Emergency 0.1 PAG dose for childhood thyroids may be four times the PAG dose for the fetal thyroid. These considerations will be expanded in the third part of my testimony relevant to off-site contention EP-11 (ECNP 2-33).

2) NRCs underestimation of radionuclide exposures

Contemporary transfer factors for reactor-to-air and water, air- and water-to-soil, soil-to-plants, plants-to-animals and man, and animals-to-man have been vast underestimates due to the utilization of minimal transfer factors at each stage of the analysis. An objective reassessment of transfer factor

values in the world's scientific literature by the Institute for Energy and the Environment, Heidelberg, W. Germany, has shown that a wide range of transfer factors exists, such that the accepted minimal NRC values are four-to-five orders of magnitude smaller than the possible maximum transfer of radionuclides from nuclear station to man. Using maximal transfer factors from the world's scientific literature, the Heidelberg Group predicted that an individual residing within two miles of a nuclear station, or consuming vegetation grown entirely within a two mile radius of the station could receive up to 720 mrem per year radiation exposure from this single source (about six times background from all other sources).

The same enhancement of transfer factors applies to radionuclides released from nuclear stations during emergencies, and, therefore, under the proper conditions, mrem doses as mentioned in the EPA PACs may be achieved orders of magnitude more easily than indicated in the GPU Emergency Plan.

Since the intent of the EPA Protective Action Guidelines is to protect the public from undue radionuclide exposure, any underestimation of mrem equivalents from a given event acts contrary to these PACs. It is likely from the two above-mentioned arguments that, considering the most radiation-sensitive stage of human existence, actual human PACs will be exceeded by orders of magnitude under conditions where extant predictions indicate only fractions of PAC dose commitments.

3) <u>False public security in fractional PAC emergency plan</u>

The GPU Emergency Plan deludes the public into the assumption that somehow they will be protected by the details of this Plan from exposures to radiation doses in excess of the EPA Protective Action Guidelines. This is patent nonsense. Establishment of General Emergency as 0.1 the EPA PACs in no way assures the public that the PACs (at the 100 percent level) will not be exceeded by any given emergency event.

It appears that this aspect of the Emergency Plan was derived solely to palliate public fears of harmful exposure to ionizing radiation emanating from potential accidents at the TMI nuclear plant unit 1. From the consideration of fractional PAC doses to the public, there would be no conceivable emergency which would commit the public to that narrow band of radionuclide exposure yielding dose equivalents between 5 and 10 percent of the EPA guidelines. Any rapidly escalating event, such as the accident at TMI-2, would pass from "Site Emergency" to "General Emergency" categories so quickly as to render the former category meaningless.

In summary, the GPU Emergency Plan emergency categories are based upon archaic dose equivalent assessments of radionuclide transfers from nuclear station to man, ignore the most radiosensitive phase of human development and are impractical for implementation during any actual emergency at TMI-1.

Cumulative Nature of Radiation-Induced Carcinogenic and Mutagenic Damage

In EP-7 the ECNP further contends that the GPU Emergency Plan "do(es) not take into account the total accumulated dose and dose commitment" received by citizens residing near Three Mile Island. The clock for the exposed public can never be set back to zero. As a result of the accident at TMI-2 in March-April 1979, venting of the containment building atmosphere in June-July 1980 and imminent potential exposure to tritium and strontium-89/90 during the proposed dumping of EPICOR-II processed auxiliary building water into the Susquehanna River, the population residing near Three Mile Island is predisposed to further carcinogenic and mutagenic radiologic insult. There is no way that this exposed public can be considered "normal." Hence, the EPA PACs do not apply to the population residing near Three Mile Island who have already been exposed to fractional PAC radiation dose equivalents.

Radiation-induced genetic events are cumulative, that is, once introduced into the gene pool of mankind, they can never be excised. If these genetic events occur in somatic cells, they may lead to cancer. If they occur in germline cells, they may result in birth defects in subsequent generations. In both cases genetic events occurring at a given time are synergistic with genetic events occurring at some subsequent time. The synergy of sequential radiation-induced genetic events in the induction of cancers and birth defects are considered separately below.

1) Synergy of sequential radiation exposures in carcinogenic initiation

Radiation doses emanating from the TMI-1 nuclear station will impact a population which has been exposed on at least two previous occasions to large radionuclide releases from TMI-2 during the past two years:

Two years ago

a) 20 million curies (NRC) or 45 million curies (Takeshi) of mostly noble gases containing 14 curies iodine-131 (NRC), 26 curies I-131 (EPA), 4100 curies I-131 (Takeshi, based on noble/iodine ratio of 20 Apr 1979) or 64,000 curies I-131 (Takeshi, based on noble/iodine ratio of NUREG-0600).

One year ago

b) 43,000 curies of krypton-85 (NRC) containing mCi levels of strontium 89/90 (Pisello).

Field vole populations captured during each of these episodes of radionuclide releases from TMI-2 confirm uptake of these elements by mammals residing nearby. Maximal thyroid doses from iodine-131 in field voles was 420 mrem, which already is .084 the EPA PAG level for this one isotope during the initial exposure. Since captured voles were adults, the I-131 levels would be higher in infant voles and much higher in fetal voles. The significance of these findings to TMI-1 Emergency Plans is that the human population may have already been exposed to radiation levels indicative of a

General Emergency due to emissions from TMI-2 in the geographic area proximate to Three Mile Island. Concerning public health, the population residing near TMI does not start out with "0 percent" of a PAG dose. They have accumulated fractional PAG dose equivalents during at least two exposures in addition to their normal background radiation exposure. It is foolish to consider restart of the TMI-1 nuclear reactor as if it were in a vacuum.

A triumph of medical science during the past two decades has been to understand the molecular genetic basis of carcinogenesis. Cancers are initiated by two separate genetic events which may be separated by years (Figure 1). One of these genetic events may be inherited from a parent, providing for the genetic predisposition to certain human cancers, which sometimes are accompanied by cytogenetic abnormalities. These special cases in which cancer predisposition is marked by chromosomal deletions have allowed the assignment of certain human cancer genes to particular chromosome bands (e.g., retinoblastoma to 13q14 and Wilms' tumor to 11p21).

In the normal population not genetically predisposed to cancer both first and second genetic events must be induced in the same population of cells in order to form a cancer stem cell capable of uncontrolled replication into that clone of cells we call "cancer." Radionuclides are potent carcinogens in that significant numbers of atoms may be lodged for long periods of time in a given organ, allowing both first and second genetic events to arise from the same carcinogenic insult.

Radionuclides which emit alpha or beta particles are especially insidious carcinogens. Although these particles have very little penetrating power outside the body, once trapped inside the body, in juxtaposition to human cells, they wreak havoc in that each disintegration results in the deposition of hundreds of ion pairs per mm of track length. This density of ionization is a major consideration in calculating radiobiologic effectiveness (RBE) of radiations, a factor used in converting radiation exposure levels to rem-equivalents in man. The track length of the krypton-85 beta particle, for example, is shown in Figure 2 superimposed upon a micrograph of human breast tissue. It is clear that lipophilic krypton-85 atoms stored in human breast fat can intercept target breast ductal or lobular epithelial cells with emitted beta particles during radioactive decay.

Created ion pairs may be either inorganic or organic ions called free radicals. Free radicals may diffuse from the ion track, affix themselves covalently to bases comprising the genetic code of DNA (forming a so-called DNA adduct) and cause a mutational event during either replication or DNA repair. Individuals homozygous for certain DNA repair or chromosomal maintenance syndromes, such as xeroderma pigmentosum, ataxia telangiectasia, Fanconi's anemia and Bloom's syndrome, are at an increased risk when exposed to radiation to develop various cancers. Worse, it has been estimated that up to 15 percent of all cancers are found in individuals heterozygous for these conditions.

Once a cell that contains a precarcinogenic lesion in its chromosomes replicates, that lesion is permanently entrapped; there is no further possibility for repair. The permanent legacy left by radiation exposure are such DNA mutations in this cell and that throughout the body. If such cells interact with further carcinogenic insults, either radiative or chemical in nature, and the perquisite second genetic event is induced, this cell will become a cancer unless caught by the immunological defense system.

In addition to the two required genetic events for initiation of carcinogenesis, a differentiation step seems to be required for the genetically predisposed cell to become a frank malignant precursor. This differentiation event can be spontaneous, but is vastly enhanced, thereby "promoting" carcinogenesis if accompanied by hormones which stimulate cellular differentiation or by trauma which injures tissue necessitating tissue regeneration. Many of the carcinogenic promotors which fail in short-term test systems to be mutagenic fall into this category, including diethylstilbestrol (DES), benzene, asbestos and tumor viruses. Radiation itself, in that it kills cells, can also promote carcinogenesis. One microgram of plutonium-239 entrapped in the alveolar epithelium of the lungs is a complete carcinogen: Initiating the first genetic event and, within a short period, the second genetic event in the same local cell population, and, finally, providing sufficient localized tissue necrosis to promote tumor differentiation and proliferation.

Each of the above events contributes to the likelihood of the next in a more than additive manner. First, second genetic events and promotion are synergistic phenomena. The first genetic event causes hypertrophy of affected cells, such as the hemihypertrophy of the renal cortex seen in children predisposed to Wilms' tumor. Hence the chance of a second genetic event occurring within this clone of cells is exacerbated by the sheer number of these cells. First and second genetic events are also synergistically related in that they will occur with higher frequency in those individuals homo- or heterozygous for the DNA repair or chromosomal maintenance deficiencies mentioned above. Finally, the interaction between initiating and promoting carcinogens is synergistic, their combined effect being much more than the additive sum of their individual effects.

The above considerations pertain to steps in carcinogenesis which initiate formation of a precursor lesion termed "carcinoma in situ" (Figure 1). There is additional proof that low level repetitive doses of radiation are more effective in inducing these lesions rather than higher level single radiation doses from both epidemiologic and experimental studies.

By no means do all carcinomas in situ become frank malignancies. Until these lesions break through their basement membranes and invade adjacent tissue (invasive carcinoma) they are not considered cancers. This leaves

one last line of host defense, the cellular immunity system, to reject these cancers before they can further differentiate towards invasiveness. The role of the cellular immunity system in cancer rejection is amply attested to by the 10-100 fold enhanced frequency of spontaneous cancers among transplant recipients who have undergone immunosuppressive prophylaxis. This cellular immunity system, mediated by thymocytes, recognizes and rejects budding tumor cells by their altered antigenic surfaces. In general, in order to overgrow surrounding tissues, neoplastic lesions must display an altered outer membrane, since these cell-cell contacts mediate normal cessation of growth. This cellular immunity system is highly sensitive to various immunoreactive cofactors, such as serotonin and histamines (produced under stress) and various lymphokines including interferons.

This final immune barrier to the induction of frank cancers is doubly sensitive to radiation insults. High levels of radiation can compromise the immune system resulting in the enhanced predisposition to cancers as mentioned above for immunosuppressed transplant recipients. The cellular immunity system is, in addition, sensitive to stress, such as the relevant stress induced in the population residing near TMI at the time of the TMI-2 accident, at a remarkably high level the following January (Mountain West Study of the NRC) and still upon either intentional or unintentional releases of radionuclides from the TMI-2 facility. This stress factor is clearly not over and will hang over the head of TMI-area residents for the duration of the TMI-2 cleanup operation, especially five-to-seven years from now during the planned decontamination and removal of the TMI-2 reactor core.

In summary, carcinogenesis is a multistage process in which contributing insults to each stage in the evolution of a cancer are synergistic rather than additive in their overall effect. The stages include:

a) First genetic event } ——(under control of
b) Second genetic event) DNA repair systems)
c) Promotion/differentiation
d) Carcinoma in situ ——— (under immune control)
e) Invasive carcinoma (= "cancer")

Insults due to radiation exposure may play a role in each step of this process resulting in cancer production.

2) <u>Synergy of sequential radiation exposures in the induction of birth defects</u>

If germline tissues rather than somatic cells are subject to radiation-induced insults, future generations may suffer birth defects. The genetic lesions involved are those mentioned above in my discussion of first and second genetic events required for the initiation of carcinogenesis. Radiation-induced liberation of ion pairs and free radicals will interact

with and mutate DNA of spermatogenic or oogenic human tissues in a manner identical with the interactions with DNA of somatic cells mentioned above. There are two discreet periods of optimal damage to oocytes in the human female:

a) During oocyte proliferation in the female fetus, when all oocytes undergo meiosis until the first meiotic prophase wherein they are "frozen" until ovulation.

b) During ovulation, when oocytes develop one or two at a time into mature eggs ready for fertilization.

Although DNA adducts may be formed in the human female oogenic tissues at other times, there is adequate opportunity for faithful DNA repair during the 12 - 40 years of the prolonged first meiotic prophase. In the human male, however, spermatogenesis is continuous following puberty, and germline cells are constantly sensitive to radiogenic damage.

We now know of over 7,500 birth defects which afflict the human race. Most of these are recessive, that is, it requires inheritance of two afflicted chromosomes to make the disease manifest. An exception is in the X-linked disorders which are uniformly expressed in the male since he inherits a single X chromosome from his mother which is unpaired by any paternal contribution. Mutagenic studies in Drosophila populations reveal the startling finding that many recessive mutations do not appear for 10 or 20 (up to 50) generations.

There are two types of synergy at work here:

a) The phenotypic synergy which occurs when two heterozygous carriers of a genetic deficiency, neither bearing the disease, bear children who are homozygous for the defect.

b) The synergy of cumulative genetic insults to the gene pool carried through successive generations of a species.

Mankind is particularly privy to the latter synergy in that modern medicine is aeugenic. Our species no longer is guided by inhumane "survival of the fittest." Many survive who could not have a decade or certainly a century ago through prostheses and intensive care. Hence our gene pool is becoming replete with mutations. Birth defect-induced maladies occupy at present fully one-third of our hospital beds.

The population residing near TMI has been exposed on two previous occasions to large radionuclide releases from TMI-2. Field voles captured during the krypton-85 venting in July 1980 showed accumulation of the radionuclide in their testicular fat (see Figure 2 and substitute spermatogenic tissues for breast tissue). Xenon-133 has similar lipophilic properties to krypton-85 and there is no reason to assume that similar uptake occurred in field voles and humans during the initial stages of the accident in March and April 1979.

3) A summary of radionuclide releases at Three Mile Island: Past and future

In its order for a hearing of August 9, 1979, concerning the restart of Unit 1 at the Three Mile Island Nuclear Station, the Nuclear Regulatory Commission clearly defined its reasons for holding these hearings: That sufficient protection of the public from radiologic hazards be guaranteed. Any realistic assessment of radiologic hazards to TMI area residents from the TMI-1 restart cannot be done in a vacuum, but must be done within the context of all radiation releases, past and planned for the future, to residents of the TMI area because of the more than cumulative nature of sequential carcinogenic and mutagenic risks from discreet radiation exposures, as outlined on previous pages.

Putting potential TMI-1 radionuclide releases into the context of total releases to the area, both past and imminent, may be summarized as follows:

TMI-2

Water

a) Initial dumping of 265,000 gallons of contaminated water into the Susquehanna on March 30, 1979.

b) EPICOR-II resins contaminated with most of the radionuclides which were deposited on the floor of the auxiliary building (stored in liners and concrete bunkers on the Island) and resulting 450,000 gallons of tritium-contaminated water (which the utility has proposed be dumped into the Susquehanna River).

c) Cleanup of 700,000 gallons of highly contaminated water in the containment building sump using the zeolite-submerged demineralizer system (SDS). This step is imminent. Disposal of both zeolites and residually contaminated water is an unsolved problem.

d) Cleanup of the highly contaminated primary coolant water (95,000 gallons); to be accomplished after core removal.

Air

e) Noble gases and other radionuclides which escaped filtration during the initial stages of the accident, March-April 1979.

f) Krypton-85 and traces of strontium-89/90 intentionally vented from the containment building atmosphere, June-July 1980.

Core

g) Dissection and removal of 100 tons of partially melted fuel rods, pellets and other amalgamated assembly. As many of the fuel assemblies as practicable will be removed through the fuel canal as in normal defueling operation.

TMI-1

h) Potential radionuclide emissions into air or water as the result of normal operation or various types of accidents.

Conclusion

This hearing before the Atomic Safety and Licensing Board was charged in the NRC order of August 9, 1979, with determining if "potential interaction between Unit 1 and damaged Unit 2" could exist (first specific concern, last paragraph, page 4). Much of this hearing has concerned potential physical interactions between Units 1 and 2. The point of my testimony here is that Unit 1 and the damaged Unit 2 are definitely biologically connected, and that this connection must be adequately understood and accounted for in any plans for TMI-1 restart.

In EP-7 (ECNP 2-8) the ECNP has validly contended that the GPU Emergency Plan for TMI-1 is deficient in considering the cumulative dose or total dose commitment in its assessment of public health hazards which may arise from potential radionuclide releases. The fraction of PAG categories of radiologic emergencies are meaningless for the TMI community in that:

1) Residents may have been exposed to radiation levels in excess of General Emergency levels already as a result of the accident at TMI-2.

2) The most radiosensitive phase of human development, the fetus, is ignored in these calculations.

3) The fractional PAG values are too closely allied to be of any practical value during any actual radiologic emergency.

4) The public residing near Three Mile Island has been predisposed to both radiation-induced carcinogenicity and birth defects.

5) Dose commitments as used in the GPU Emergency Plan may be underestimates by orders of magnitude if transfer factors from TMI-1 to nearby residents are re-assessed according to the Heidelberg Report.

EP-10 (ECNP 2-28)

> Appendix D of the Plan contains reference to the need for the decontamination of radiologically contaminated individuals (p. 16) but does not provide any information as to how many people may be contaminated, the kind and degree of contamination expected or to be planned for, or the number of facilities and medical personnel appropriately trained in decontamination and radiation injury treatment techniques which may be necessary.

It is vital for both worker and nearby resident populations that appropriate biological monitoring and decontamination procedures be well worked out in advance of TMI-1 restart. The entire testimony of the previous 10 pages attests to the special predisposition of these populations to damage induced by any radionuclides released from TMI-1 during either normal operation or in the event of an emergency.

The Plan must take into account three overtly sensitive segments of the population residing or working in the TMI area:

> 1) Those individuals who are predisposed to radiation-induced carcinogenesis or mutagenesis due to prior radiation exposure (e.g., to radionuclides released during the accident at TMI-2 or subsequent radionuclide releases).
>
> 2) The human fetus.
>
> 3) Individuals who are homozygous or heterozygous for one of the following genetic diseases
>
> a) xeroderma pigmentosum
> b) ataxia telangiectasia
> c) Bloom's syndrome
> d) Fanconi's anemia.

In that radiation monitoring off-site cannot detect these individuals, it is suggested that the Plan include provisions for individual radiogenically-induced cytogenic monitoring in the event of accidental releases during a radiologic emergency. The advantage of this technique is that it is personal; it uses an individuals own white blood cells to monitor chromosomal damage to the individual resulting from radiation exposure. Radiations have been shown to induce cytogenetic abnormalities in proportion to pre-carcinogenic or pre-mutagenic events in human subjects.

The CPU Emergency Plan fails to take into account different susceptible groups within our population to radiation-induced genotoxic effects and should make provision for protection of these groups.

EP-11 (ECNP 2-33)

> The BRP plan (Appendix 8) relies on the infant thyroid dose (1.5 rem) as the dose from milk ingestion to be avoided (p. LX-4). This does not take into account the fetus, whose sensitivity may greatly exceed that of the infant. In addition, the value of 1.5 rem to the thyroid from milk ingestion does not take into account the inhalation exposure.

Whereas the previous page of my testimony pertained to all radionuclide exposures, this section refers specifically to exposures to one radionuclide, iodine-131/132. (During the early stages of radionuclide releases of fission products the iodine-132 contribution can outweigh that of iodine-131. In addition, the hypothyroid-inducing potential of the two isotopes has been found to be synergistic rather than additive.) For the sake of brevity, I will refer herein only to iodine-131.

This section of my testimony, relevant to ECNP contention EP-11, will consist of four parts:

1) The special sensitivity of the fetus to iodine-131-induced hypothyroidism.

2) Deficiencies in the Bureau of Radiation Protection Plan.

3) Evidence that normally operating nuclear stations release considerable iodine-131.

4) Conclusions.

1) The special sensitivity of the fetus to iodine-131-induced hypothyroidism.

Depending upon the stage of human fetal development (week of gestation), the human fetal thyroid gland is up to 200 times more sensitive to hypothyroidism induced by iodine-131 than the adult thyroid. This exquisite sensitivity of the fetal thyroid to iodine-131 is a product of both the higher affinity of the developing thyroid gland for iodine and the greater sensitivity of rapidly dividing tissues to radiation-induced damage.

Since the thyroid hormone, thyroxin, requires 3-4 atoms of iodine to be functional, all isotopes of iodine, including 131 and 132, are scavanged by the developing thyroid gland. Disturbance of thyroid function is serious, especially in the developing fetus, since thyroxin is required for normal skeletal development, including the skull. Fetuses with insufficient thyroxin are born with a form of cretinism which may be accompanied by mental retardation and eventually death due to smal cranial capacity. For this reason, neonatal hypothyroidism has been checked as a birth defect in all Pennsylvania newborns since mid-1978.

There is some evidence that sufficient iodine-131 leaked from the TMI-2 nuclear station during the accident in March-April 1979 to induce an excess of neonatal hypothyroidism. This evidence is relevant to TMI-1 restart in that the same area residents were affected and, as I shall discuss further in section 3, there is evidence that normally operating reactors release significant amounts of iodine-131.

There are three types of evidence that TMI area residents suffered considerable contamination with iodine-131 during the TMI-2 accident and subsequent increased levels of neonatal hypothyroidism.

a) There was a significant increase in rates of neonatal hypothyroidism downwind and downstream from the TMI-2 nuclear station in the nine months after the accident.

b) Field voles trapped in the third week of the accident contained significant levels of iodine-131 in their thyroids.

c) Calculations from noble gas/iodine ratios indicate that 5,100-64,000 curies of iodine-131 may have been released.

a) Neonatal hypothyroidism after TMI-2

The normal rate of neonatal hypothyroidism in the U.S. is 1/4,300 live births, a rate that has been seen in Pennsylvania as a whole since testing began in mid-1978. In Lancaster County, however, following the TMI-2 accident between March 28 and December 31, 1979, there were 6 cases of neonatal hypothyroidism in 2,700 live births. This is ten times the expected number of cases of this birth defect. The City of Lancaster receives 8 million gallons of drinking water each day less than 10 miles downstream from the TMI-2 nuclear station.

Downwind from the TMI-2 nuclear station, a statistically higher number of neonatal hypothyroid births was also seen in the nine months following the accident. The pattern of neonatal hypothyroid births in Pennsylvania before and after the TMI-2 accident is seen in Figure 4. Since the predominant wind direction following the accident was northeast, those counties contiguous to and including Dauphin in the northeasterly direction are compared for neonatal hypothyroid births during the nine months before and after the accident (Table 1). Whereas Dauphin, Lebanon, Berks, Schuylkill, Lehigh and Carbon counties had two cases in the nine months before the accident, there were eight cases in the nine months after. Other sections of Pennsylvania (west of Harrisburg, the five county Philadelphia area) had comparable rates before and after the accident. Hence, these unusual incidences of neonatal hypothyroidism are associated both temporally and geographically with the time of the accident and the place of Three Mile Island.

In addition to increases in hypothyroidism, there was a statistically significant increase in infant mortalities within a ten mile radius of TMI-2 following the accident (Table 2).

b) Animal studies

Three different types of animal studies were done in the TMI area after the accident March-April 1979 to determine potential contamination with iodine-131. These were mediated by Millersville State College, the University of Missouri and the NRC. The results of the three studies are summarized in Table 3.

The Millersville team captured field voles at three sites, about 20 voles per site. Voles captured during the third week of the accident 1.9 km northeast from the reactor had a mean value of 1866 pCi/g thyroid (maximum, 3800 pCi/g or 3.8 nCi/g). Voles captured 2.3 km to the east had less than half the northeast populations' mean iodine-131 content: 733 pCi/g thyroid tissue, whereas voles captured 12.9 km to the northeast showed no appreciable iodine-131 in their thyroids. Maximally these voles could have received 420 mrem thyroid exposure calibrated to April 9th.

These findings are substantiated by the single vole captured by the University of Missouri team 0.8 km east of the reactor. This vole contained 0.53 pCi/g whole body weight (1500 pCi/3 mg thyroid) iodine-131 calibrated to April 25th (about 6000 pCi/g if calibrated to April 9th).

The University of Missouri team also analyzed the thyroids of three rabbits captured 1.6 to 4.8 km northeast of the TMI-2 nuclear station on April 24th. The pooled thyroid samples showed 644 pCi/g when calibrated to April 9th.

As compared to the NRC cow and goat milk samples of the same period (36 and 41 fCi/ml, respectively), the field vole and rabbit thyroid gland samples showed five orders of magnitude more activity on a weight equivalent basis. The experiments show the poor sensitivity of milk to environmental contamination by iodine-131 and may explain the NRC's underestimation of the extent of iodine contamination following the accident at TMI-2.

If one allows for the iodine-131 and -132 levels during the initial phase of the accident at TMI-2, and for the greater sensitivity of the fetal thyroid gland to iodine-131, it may be calculated that the 3.3nCi/g iodine-131 seen in voles is sufficient to induce neonatal hypothyroidism (Table 4).

c) Calculations of iodine-131 release at TMI-2

Official estimates of 14-26 curies iodine-131 release at TMI-2 during the course of the accident may be orders of magnitude to low according to Takeshi. Utilizing the ratio of noble gases to iodine-131 on April 20th (when the noble gas monitors dropped by onto scale), Takeshi derives an iodine-131 release of 5,100 curies (Table 5A). On the other hand, if the release rates of NUREG-0600 are utilized, Takeshi derives total iodine-131 released during the TMI-2 accident as 64,000 curies (Table 5B).

In summary, considering the higher iodine-131 release levels calculated by Takeshi and the hypothyroid-inducing levels

of iodine-131 found in the thyroid glands of animals trapped during the accident, it is plausible that the statistically significant increases in neonatal hypothyroidism seen in human births near the TMI-2 nuclear station after the accident were due to human exposure to iodine-131 from the reactor.

These considerations are critical in the consideration of TMI-1 restart, for, as I shall document in section 3, there is evidence for considerable iodine-131 from normally operating nuclear stations. Since the TMI area residents have already been exposed to iodine-131 as a result of the TMI-2 accident, this isotope must be monitored with extreme precision if TMI-1 is to go back online (see section 4). This required precision for the protection of the health of TMI area residents is lacking in the Bureau of Radiation Protection Plan.

2) Deficiencies in the Bureau of Radiation Protection Plan

Considering potential iodine-131 doses to infants, the BRP Plan is deficient in three areas:

a) Milk is not a good monitor for iodine-131.

b) The stated thyroid dose to be avoided (1.5 rem) is at least an order of magnitude to high if we consider the fetus.

c) Iodine-131 may be inhaled as a gas in addition to being ingested.

Prior to the restart of TMI-1, this Plan must be augmented in order to truly protect the public from potential adverse effects of releases from the nuclear station. Lack of such protection for the Unit 2 nuclear station may have resulted in the neonatal hypothyroid and infant mortality increases seen following the accident.

a) Milk as iodine-131 monitor

On a weight equivalent basis, milk is five orders of magnitude less sensitive than field vole thyroids in iodine-131 monitoring of the environment. The use of milk for monitoring of environmental contamination by radionuclides is appropriate for strontium-89/90 and cesium-137, which mimic calcium in their chemical properties and are therefore quite prevalent in milk. Extension of this device for measurements of iodine-131 levels, however, is strained at best. More appropriate monitoring tools, such as caged or feral small mammals, should be employed for iodine-131 levels rather than antequated sampling of cow and goat milk.

b) Fetal hypersensitivity to iodine-131

In addition to inadequate iodine-131 monitoring, the BRP Plan indicates a level of this radionuclide not to be exceeded which is at least an order of magnitude above a neonatal hypothyroid dose. The fetus must be regarded as a helpless lifeform, exquisitely sensitive to iodine-131 trauma.

For the safety of the fetus, it is suggested that the thyroid dose not to be exceeded in the BRP Plan be changed from 1.5 rem to 150 mrem.

c) Inhalation dose

By its concentration on iodine-131 levels in milk, the BRP Plan considers solely the ingestion pathway for human contamination by this radionuclide. Significant contamination of humans, including pregnant mothers, can occur by inhalation of iodine-131 while it is contaminating the ambient air as a gas (its native state). Inhaled iodine-131 is readily dissolved in the blood and adsorbed by the thyroid gland. Again, this defect in the BRP Plan would be obviated through use of small mammals as monitors for iodine-131 contamination.

In summary, the emergency plan of the Bureau of Radiation Protection is flawed concerning protection of the public from iodine-131 which might emanate from TMI-1. The Plan relies on milk as monitor and fails to consider either the enhanced sensitivity of the fetus or inhalation routes of exposure to iodine-131. This section of the BRP Plan must be revised before the public will be protected from potential iodine-131 releases at TMI-1.

3) Evidence that normally operating nuclear stations release considerable iodine-131

Although the iodine-131 releases may have been underestimated by orders of magnitude at TMI-2 during the accident, this was clearly not during normal operation. What is the evidence that normally operating stations release dangerous levels of iodine-131?

The first evidence comes from the Savannah River Plant in South Carolina. Atomic Energy Commission documents for years reported no levels of iodine-131 contamination of the environment surrounding the Savannah River Plant. Yet recent declassified documents showed that the extent of iodine-131 release was 2,500 curies between 1955 and 1961. This was a period of presumably normal operation at the nuclear plant.

The second evidence that normally operating plants may release hypothyroid-inducing amounts of iodine-131 comes from closer to home. Earlier I cited the 6/2,700 frequency of neonatal hypothyroid births in Lancaster County between March and December, 1979, as being ten times the expected rate. Paradoxically this high rate has continued into the first eight months of 1980. This is long after iodine-131 from the TMI-2 reactor would have dissipated and decayed. However, Lancaster County is just east (downwind) of York County, which contains the Peachbottom nuclear stations in its southeast corner. This is an old nuclear power plant of the Indian Point reactor vintage. Could it be leaking significant iodine-131?

4) Conclusions

Considerable information is available about hypothyroidism induced by iodine-131 as a fission product from the studies of the Marshallese and from the Baneberry Event in Utah (both in the 1950's). We understand what can happen in both man and animal when exposed to high levels of iodine-131. A functional thyroid gland is required for good childhood and adult health and absolutely vital for the fetus. Unlike almost all other radionuclides, iodine-131 zeros in on only one target organ, the thyroid, and, if present during critical periods of development, in sufficient concentration, this radionuclide can ablate thyroid development.

There may have been considerable contamination of the TMI area by iodine-131 during the accident at TMI-2 which caused significant health problems to develop in human fetuses in utero. There is suspicion that TMI-1 as a normally operating nuclear station may emit iodine-131. Definitely in the case of a radiologic emergency this radionuclide will be among the most dangerous. It is therefore crucial that the Bureau of Radiation Protection ensure public protection from further exposure to iodine-131 in the area around Three Mile Island.

Concerning its plan to protect citizens from iodine-131 exposure at TMI-1, the Bureau must revise its monitoring program, it is suggested to include small mammals as sensitive probes for the radionuclide. Dose allowances should also be tightened by an order of magnitude in consideration of the exquisite sensitivity of the fetal thyroid to iodine-131 damage.

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Figure 1

STEPS IN CARCINOGENESIS

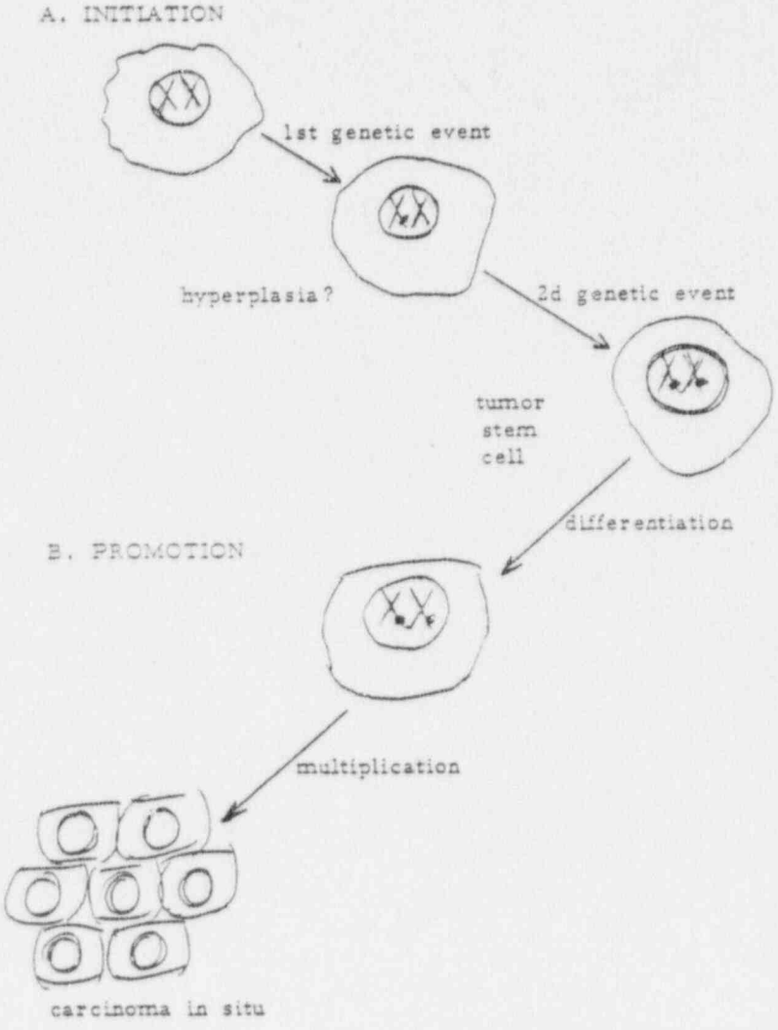
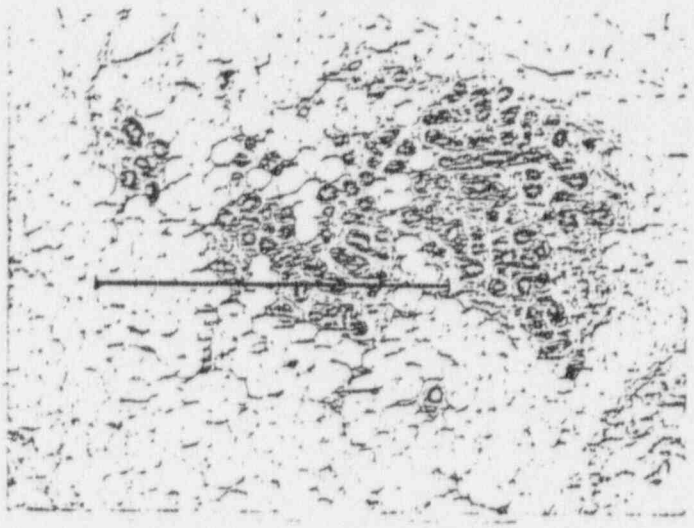


Figure 2



Normal breast epithelial cells (above) and carcinoma cells (below) showing juxtaposition with fatty areas (clear globules). The bar indicates 25 mm, the track length of the krypton-85 beta particle.

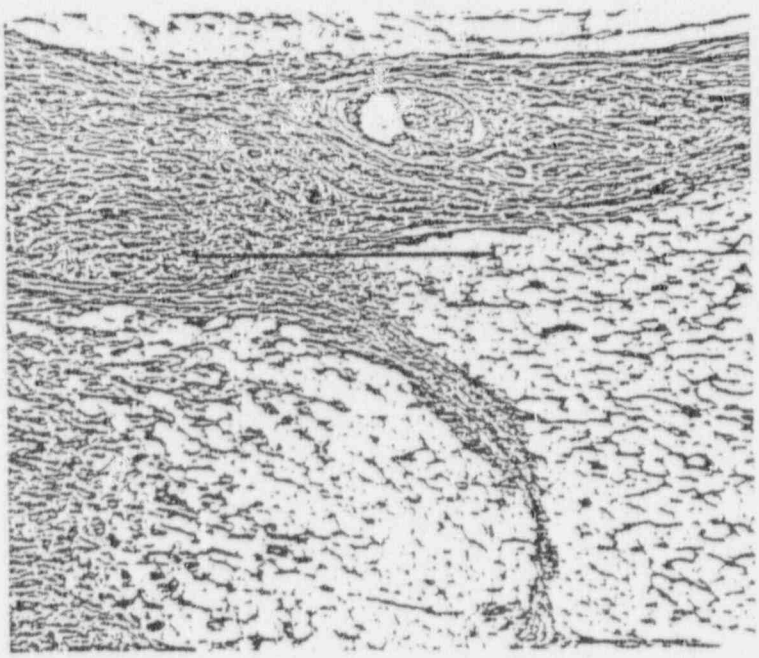
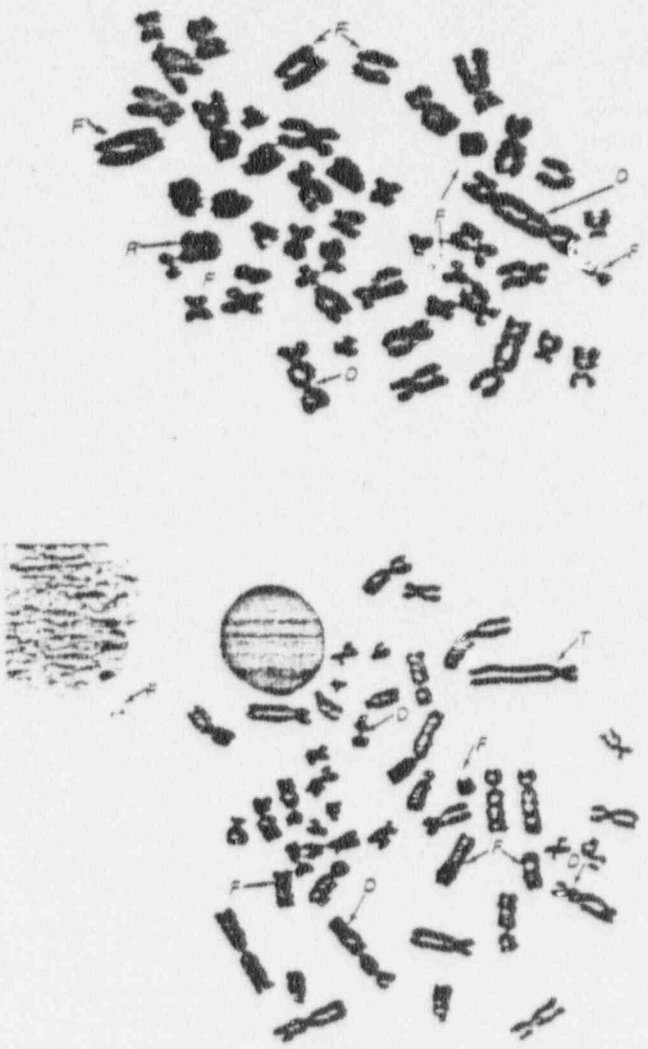


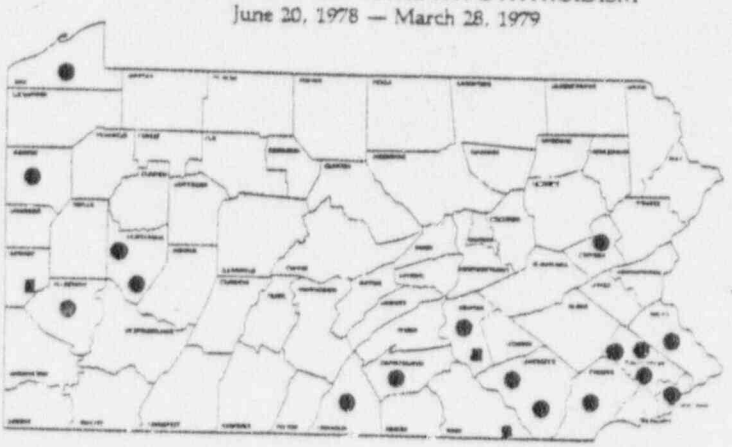
Figure 3



Two photographs of x-ray induced chromosome aberrations in human peripheral blood lymphocytes. The aberrations seen include: D, dicentrics (two centromeres); F, acentric fragments (no centromere); T, reciprocal translocations (shift of centromere); and R, rings. (Courtesy of Michael Bender)

Figure 4

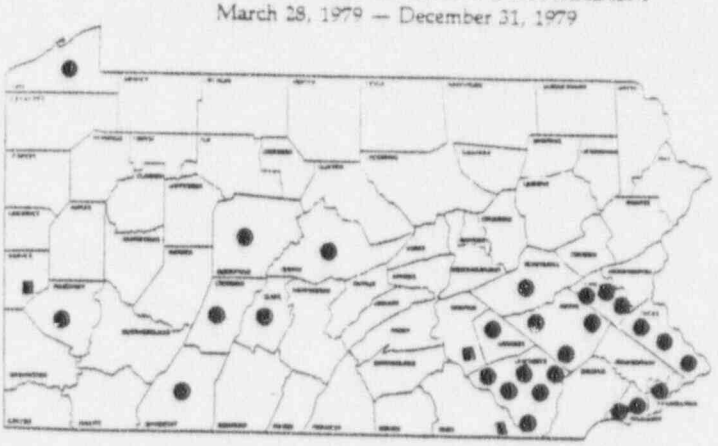
INCIDENCE OF NEONATAL HYPOTHYROIDISM
June 20, 1978 — March 28, 1979



● Neonatal Hypothyroidism Case
■ Nuclear Power Plant

PENNSYLVANIA
Cases Reported By
Department of Health

INCIDENCE OF NEONATAL HYPOTHYROIDISM
March 28, 1979 — December 31, 1979



● Neonatal Hypothyroidism Case
■ Nuclear Power Plant

PENNSYLVANIA
Cases Reported By
Department of Health

Table 1

NEONATAL HYPOTHYROIDISM

During the nine months before and after the accident

Geographic Area	Before	After
Pennsylvania west of Harrisburg	7	7
Five county area of Philadelphia	6	6
Rest of Pennsylvania	4	14 *
Total	17	27
Downwind TMI (Dauphin, Lebanon, Berks, Schuylkill, Lehigh, Carbon)	2	8 *
Downstream TMI (Lancaster County)	2	6

* Difference significant at $p < 0.05$.

Table 2

INFANT MORTALITIES WITHIN 5 OR 10 MILES OF TMI

5 mile radius

	1977	1978	1979
no. deaths	3	1	7
rate/1000 births	6.7	2.3	16.1

10 mile radius

	1977	1978	1979
no. deaths	20	14	31
rate/1000 births	10.5	7.2	15.7

1977-78 average v. 1979

	1977-78	1979
no. deaths, 5 mi.	2	7
no. deaths, 10 mi.	17	31 *

*Difference significant at $p < 0.05$.

Table 3

SUMMARY OF ANIMAL STUDIES - IODINE-131 IN THYROIDS

	Site	Number	Mean (per thyroid)	Max	Mean (per gram*)	mrem
	Field Voles					
April 6-16th	12.9 km NE	20	0.0 ± 0.? pCi	-	-	
	2.3 km E	22	2.2 ± 1.1	-	723 pCi	82.5
	1.9 km NE	18	5.6 ± 1.2	11.4	1866 (4/9)	210
			*assuming 3 mg/thyroid			
April 25th	0.8 km E	1			0.53 (4/25) (1500)	
	Rabbits					
April 24th	1.6 to 4.8 km NE	3 *			644 (4/9) 161 (4/24)	72.5
	*composite sample not counted until May 8th					
	Cow Milk				Max (/ml)	
					36 fCi	
	Goat Milk				41	
	Isopleths				105	
	1.9 km NE					18

1866 pCi/g in field vole thyroids is conservative:

1) Maximal values were 3800 pCi/g (3.8 nCi/g).
2) Thyroids may weigh less than 3 mg.
3) Calculations are to April 9th when maximal I-131 releases were March 28 - April 1st.
4) Only I-131 calculated (early I-132 mrem may have exceeded I-131, they are synergistic)
5) Fetal thyroids 10-200 X affinity for iodine.

Table 4

NEONATAL HYPOTHYROIDISM AND IODINE-131 AT TMI

CONSIDERATIONS

1. 4 nCi/g max in voles, 1.9 km NE
2. ---> 8 nCi/g (4/9 ---> 4/1.79)
3. ---> 80 nCi/g from equivalent I-132 (I-132 9X I-131)
4. ---> 16000 nCi/g because fetal thyroid 10-200 X uptake I-131 (16 μCi/g)
5. 50% suppression of rat thyroid with 13 μCi/g I-131
6. therefore, potentially hypothyroid-inducing dose released at TMI

Table 5

RELEASE OF IODINE-131 AT TMI (Takeshi)

A. Calculation from I-131 and noble gas releases on April 20th

1. I-131 release rate = 1.4 μCi / sec
2. noble gases released at 4,700 μCi / sec
3. I-131 / noble gases = 1 / 3400
4. Extrapolation to March 28th: I-131 / noble = 1 / 8800
5. Total noble gases released = 45 x 10^6 Ci
6. Therefore, total I-131 released = 45 x 10^6 / 8800

   = 5100 Ci

B. Calculation from NUREG-0600 (NRC Office of Inspection and Enforcement, Aug. 1979 "Investigation into TMI accident")

1. I-131 releases began 7 a.m. March 28th
2. I-131 to noble gas release ratio then = 1 / 700
3. Maximal iodine releases occurred within a few hours
4. Therefore, I-131 release = 45 x 10^6 / 700

   = 64,000 Ci

C. Admitted release of I-131 = 14-26 Ci