

# The TMI 2 Story

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# INTRODUCTION

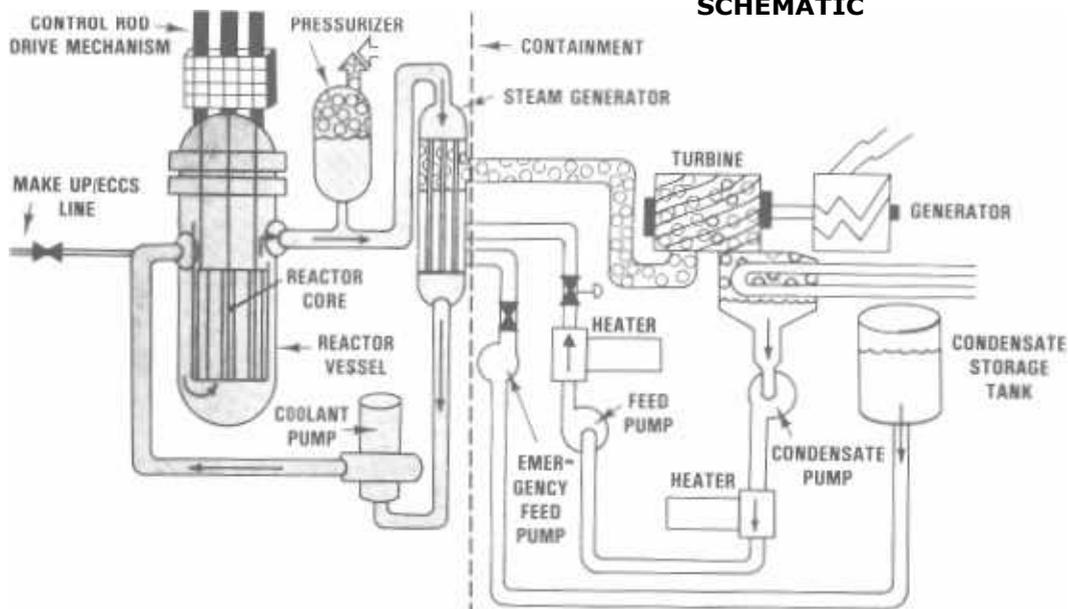
The accident at our Three Mile Island Unit 2 (TMI-2) nuclear generating station near Harrisburg, Pennsylvania, left many unanswered questions for us in the General Public Utilities system, for our customers, for our investors, and for the general public.

Some of these questions are technical, some financial, some relate to communications, and some are of a longer term, national policy nature.

This booklet was prepared for our employees in an attempt to explain, using the information presently available, what happened at the reactor, what happened to communications, and what are some of the many aftermaths of the accident.

Numerous studies and investigations, both outside and inside the company, are underway. Full support and cooperation has been pledged to these efforts. It is essential to learn as much as possible from this unfortunate accident.

## THREE MILE ISLAND UNIT TWO SCHEMATIC



## THE TMI-2 ACCIDENT

**NOTE:** Of necessity, this is an abridged version of the sequence of events. A more detailed report is available from your Employee Communications Department.

*The following is a description of the TMI-2 accident as it was presented by Herman M. Dieckamp, president of GPU, at the GPU Annual Stockholders Meeting on May 9, 1979.*

I would like to provide a brief description of the major pieces of equipment that constitute a nuclear plant like Three Mile Island, so that as you read about the accident in the press and other media, you will be better able to follow the discussion and understand what is being said.

I will then provide a brief description of the components of the system and the manner in which the response of TMI's operators contributed to the magnitude of the accident. I will finish off with a brief description of the status of the plant and the outlook for the future.

I certainly don't have any aspirations to convert all of us to senior nuclear engineers, but I do think these are things that can be described and can be understood.

Let me see if I can lead us through a nuclear unit.

If you look to the left side of the schematic, you will see what we refer to as the primary coolant circuit of the plant. That portion is all contained within the reactor containment building, represented by the dashed line with the top caption "Containment." When you look at pictures of nuclear plants, you will see generally a large, cylindrical, concrete structure - that is the containment building of the plant.

### Reactor Components

Now let's look at some of the components within that primary cooling circuit. First, let's start with the reactor core. It is there within the reactor vessel. The reactor core is a region of nuclear fuel assemblies. The core is roughly, 10 feet in diameter and about 12-13 feet in height. The reactor itself is a heavy-walled pressure vessel that is of the order of 60 feet high and about 15 feet in diameter.

The nuclear reaction produces heat. In that sense, it is no different from a fossil-fired power plant. We start with a form of energy, that is, heat which we, in turn, want to convert to electricity. That heat is transported by means of circulating high-pressure and high-temperature water.

The primary system runs at about 2,000 pounds per square inch and at about 600°F. The primary coolant pump causes that water to circulate through the system. The purpose of this circulation is to transport the heat from the reactor to the steam generator.

In the steam generator, water from a separate loop (that one which starts in the sector outside the containment building, the right-hand portion of the schematic drawing) is caused to boil and absorb the heat from the reactor in the form of high-pressure and high-temperature steam. That steam, in turn, is expanded through a turbine

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and then discharged from the turbine to a condenser. The steam is cooled (condensed) and changed back to water. It then is returned by means of feed-water pumps to feed-water heaters and then back to the steam generator. In many ways, this secondary portion outside the containment of the plant is not at all unlike a fossil-fired power plant.

One other component that I would like to point out at this time is back in the primary loop and is the one labeled "Pressurizer." Its purpose is two-fold: 1) it is the device by which we maintain the high pressure in that primary circuit and attempt to maintain that cooling water at all times in a liquid or non-boiling state; 2) that pressurizer is used to absorb changes in volume as the primary system heats up and cools down.

I think this largely describes the functioning parts of the system that you have seen referred to in various press accounts of the accident and, I would hope, gives you some feel for how the power plant functions.

Again, briefly, the heat in the reactor is transported by flowing water to the steam generator. The secondary loop of water is converted to steam in the steam generator, expands through a turbine, the turbine turns a generator and makes electricity. The discharged steam from the turbine is condensed and returned to the steam generator. The heat energy which is not converted to electricity is rejected to the environment in a third loop through the massive cooling towers that you see dominating photos of the TMI station.

Now, let us turn our attention to the things that did not function as intended and, thus, contributed to the magnitude of the accident at Three Mile Island.

### **Start in Secondary System**

First of all, the accident began with a failure in the secondary, non-nuclear portion of the plant.

Specifically, the main feed-water pumps were turned off by some mechanical or electrical failure in their control circuitry. That, in turn, led to a reduction in the heat removal capabilities of the steam generator and, as a result, not only did the turbine trip (by that we mean it was shut off), but also the reactor tripped or was scrammed (by that we also mean it was shut off). These two events occurred very rapidly and exactly as expected.

At this point, everything was in accordance with normal design. Immediately, however, the pressure in the primary system (the nuclear portion) began to increase. In order to prevent that pressure from becoming excessive, a valve located at the top of the pressurizer opened. That valve (you will sometimes find it referred to as an electric valve) should have reclosed when the pressure decreased by about 100 pounds per square inch. However, that valve failed to reclose.

The signals available to the operator, both in terms of an indicator of the command to close and in terms of temperatures in the region of that valve did not indicate to the operator that the valve continued to be open. However, the fact that that valve was stuck open caused the system pressure to continue to decrease.

Next, let's turn to the emergency feed pumps. The emergency feed pumps are back-up, duplicate safety devices in the event the regular feed-water pumps fail. They are subjected to routine surveillance tests in order to determine that they are functional and are available to support the plant in case of need. The last time that system was tested was 42 hours prior to the accident.

In order to test that emergency feed system, it is necessary to close a valve and isolate it so that it cannot open. The test program requires that that valve be reopened into the safe condition at the end

of the test program. Through some administrative or human failing, that valve apparently was not restored to the open position at the end of the test. It was discovered as being closed about eight minutes after the start of the accident. The operators then opened that valve and that system functioned as intended.

During this period, the system pressure continued to diminish due to leakage from the open pressurizer valve.

In response to a reactor and turbine scram, as was experienced here, the operator knows that water levels in the primary loop normally begin to decrease. He has available to him a gauge which measures the water level in the pressurizer. Under normal circumstances, that water level is his prime indicator to tell him that the primary system is full of water and thus capable of reliable heat transfer or heat removal from the core.

As the system pressure continued to decrease due to the stuck valve, voids began to form in portions of the system other than the pressurizer. Thus, the liquid in the primary system redistributed itself and the pressurizer became full of water, but there were voids in other parts of the system. The level indicator in the pressurizer suggested that the system was full of water and caused the operator to stop adding water to the system. He was unaware that, because of the stuck valve, the indicator can, under some circumstances, become ambiguous.

### **Steam Voids Develop**

The net result of this continuing reduction in pressure and the halt of additions of water to the system (halted because the information available to the operator suggested to him that the plant was adequately full) caused the development of steam voids in the primary

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loop where there should be only water. This reduced the efficiency of heat removal from the core.

About 100 minutes after the start of the accident, the operator noted that the main pumps were getting to a region of operating conditions that were beyond their defined limits. As a result, he turned off the four circulating pumps. This had the effect of further diminishing the ability of the system to remove heat from the core.

#### Hydrogen Forms

About 100 minutes to 200 minutes after the accident, the removal of the residual heat being produced in the reactor core was inadequate. Because of this, the fuel materials overheated to the point that some of the zirconium cladding (that contains the nuclear fuel pellets) reacted with water and generated hydrogen. The hydrogen, in turn, was released to the reactor containment building. Some hydrogen remained within the primary coolant system and resulted in the hydrogen bubble we heard so much about.

The real damage to the reactor occurred in this time period of 100 to 200 minutes after the 4:00 a.m. start of the accident. The operators required until about 8:00 in the evening to return the system to a near normal operating condition, with the primary system full of water (except for the hydrogen bubble) and with the pumps operating so as to have firm, reliable heat removal from the reactor core.

#### Accident Summation

So, without going further into detail, let me say in summary, that the accident was a result of a complex combination or interaction between equipment failures, procedural failures, operator misjudgments, ambiguous instrumentation and a number of factors which all, when contributing together, led to this problem. In order to fully understand the role of the operators, as contrasted with the role of the equipment failures, one has to look back at our prior

conceptions of reactor accidents and the degree to which they formed the foundation for training and the degree to which the operator's prior experience preconditioned his responses. I think it is clear to us, and we are confident that the many subsequent investigations will confirm, that the accident was not a simple case of an operator who made a mistake but, rather, that the accident was a result of a complex interaction of an unanticipated combination of factors.

#### Present Status

Now let me go ahead to say where the plant is today. The plant

has been put into essentially what has been popularly referred to as the cold shut-down condition. The residual heat from the reactor is being removed by means of natural circulation of the water in the primary loop. The heat is being removed by sending water through the steam generator so that it produces steam which, in turn, goes to the condenser. In the condenser, the steam is cooled and the heat is rejected through the cooling towers. The maximum temperature inside the reactor core is reported by the NRC to be about 310°F.

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## COMMUNICATIONS PROVES A TWO-EDGED SWORD

One of the most important, and most difficult, aspects of the TMI accident was securing and distributing timely, accurate and complete information. This information was vital not only to the public and media, but also to GPU and state and federal personnel.

Pennsylvania's Governor Richard Thornburgh discussed both the importance of communications and the problems faced concerning TMI information during a congressional hearing.

He said, "...the gathering, evaluation and communication of facts are indispensable to decision-makers in any situation, be they Little League coaches or five-star generals. This is why I must point first to the information problem, perhaps the toughest (problem), we faced in a very tough situation."

The Governor's office had previously stated that some of the technical information given during the first days of the TMI nuclear accident was "conflicting and confusing" because there were many sources acting as spokespersons who offered conflicting opinions.

Continuing this theme in his testimony, Governor Thornburgh told the Congressmen that Met-Ed issued statements in the first days

of the accident which proved to be something less than accurate, and, "its (Met-Ed's) credibility as a reliable source of information eroded rather quickly" from that point.

The whole situation was unfortunate, but developed because Met-Ed was providing information based on its judgment of rapidly changing plant conditions. In this type of situation, it is not necessarily surprising that some statements made based on present knowledge would prove inaccurate as more information was secured and analyzed. Other informational sources, including the Nuclear Regulatory Commission (NRC), suffered from this problem of a continuing accident with rapidly changing conditions.

#### Site Emergency Declared

Another major concern has been the delay between the initiation of the accident and the time when officials were notified. Additional information has now revealed that during the initial stages of the accident, the plant operators thought they were experiencing a normal incident involving loss of feedwater. It wasn't until about 6:50 a.m.,

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The average temperature of the water that is circulating to cool the reactor is about 170 to 180°F. This is below the boiling point of water, even at atmospheric pressure.

Backing up, let me emphasize that in the immediate time period after the accident, our attentions were directed to four high priority activities. One, to maintain the crippled or damaged reactor in a continually safe operating mode so that the situation would not further degenerate. Second, to do everything humanly possible to minimize any releases of radioactivity to the environment, and thus any hazard to the local populace. There were, indeed, some releases of radioactivity. They were, to a large extent, the result of continuing safety operations that had to be done within the plant. A number of modifications were made to the plant in order to provide additional filtration devices to capture any radioactivity and minimize releases to the public. The third goal was to move safely to a cold shutdown. And we have recently completed our fourth priority activity, to put in place a number of auxiliary systems to reinforce the ability of the plant to remain in this safe, cold shutdown condition.

#### Looking Ahead

As we look forward, we think the plant will be out of service for approximately three years. During this time, we will need to remove any radioactive atmosphere from the primary containment. We will have to reenter that containment and begin to decontaminate any radioactive materials that spilled out through the stuck open relief valve. We will then have to gain entry to the reactor vessel, ascertain the exact degree of mechanical damage to the fuel material, remove that fuel material and then clean up the primary loop. These activities then are the necessary precursors to returning the plant to service.

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almost three hours after the reactor tripped, that radiation alarms alerted operators to the real potential for off-site releases. At this time, the first criterion for declaring a Site Emergency was met.

A Site Emergency was therefore declared at 7:02 a.m. and Pennsylvania's Emergency Management Agency, Dauphin County's Emergency Center, and Pennsylvania's State Bureau of Radiological Protection (BRP) duty officer were notified.

The NRC's office in King of Prussia, Pennsylvania was called at 7:04 a.m. The answering service which received this call was alerted to the reactor trip, to the possibility of primary to secondary leakage through a steam generator, to the declaration of a Site Emergency at TMI-2, and to the fact that no releases were known to have occurred at that time. State Civil Defense officials and the Pennsylvania Department of Environmental Resources were also notified. However, because of a mechanical failure in their electronic communications system, the NRC did not receive the notification until 7:45 a.m.

York County Civil Defense officials said they received notification at 7:27 a.m., and the Governor's office stated it was notified at 7:50 a.m.

#### General Emergency Situation

At 7:24 a.m., the reactor building high range gamma monitor alarm was set off. The emergency classification was then escalated per the emergency plan, to the level of a General Emergency. Notifications of this change in status were then made. During the period from 7:30 to 8:30 a.m., March 28, approved emergency plans were initiated. Communications, both on-site and off-site, were established and radiation monitoring teams were dispatched off-site to detect and verify releases.



*Harold Denton, NJ C operations chief, spent many challenging days at TMI.*

#### NRC Arrives on the Scene

Throughout that first day of the accident, these on-site and off-site radiological monitoring teams were providing a full flow of data to the Emergency Control Center at TMI. Constant communication existed through open lines from Unit-2's control room to the state's Bureau of Radiological Protection and to the NRC's Region I offices in King of Prussia.

As data was received at the site from radiological monitoring teams, it was immediately relayed to both the NRC and to the state.

NRC personnel arrived at the plant at about 9 a.m. on March 28, and from that time, they were in the control room itself and had direct access to all information.

NRC officials also established a communications program. After Harold Denton, operations chief, arrived at the site late Friday, March 30, the NRC staff arranged daily plant status reports for the media, and they were in direct communication with Governor Thornburgh's office helping the Governor map out civil defense moves in case an evacuation were necessary.

#### Conflicting Reports

While there was optimism on Thursday, March 29, following reports that the plant was under

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control, on Friday, March 30, the situation took an apparent turn for the worse. A burst of radioactive gas was released, touching off confusion on the part of the media and more doubt from an already doubting public. The release was later explained as necessary because technicians were aware that a considerable amount of gas containing hydrogen and fission gases had accumulated and had to be vented early Friday morning. The NRC technicians on-site were aware of the release, but again communications broke down and the Governor's office said it was not notified.

Governor Thornburgh was informed by an undetermined source, however, that the release measured 1,200 millirems, which would be cause for concern. Other reports said a plane flying directly through the plume measured the release at 350 millirems per hour,

It was at this time that the Governor discussed the possibility of evacuation with NRC Chairman Joseph Hendrie. Governor Thornburgh issued an advisory that pregnant women and pre-school children living within in a five-mile radius of the plant be evacuated.

The Governor also ordered all schools in the area closed and suggested that people living within 10 miles of the plant stay inside and keep their windows closed.

#### Media Confusion

Some media coverage also caused confusion. Because they were receiving different reports and were dealing with a highly technical subject, media representatives sometimes gave conflicting reports, which further added to public confusion.

In a later statement, Governor Thornburgh said: "In dealing with other institutions, I came to appreciate the problem news reporters were facing. The nuclear trade jargon, the clamor of competing experts, and the garble gap between Harrisburg and Washington, all made it quite easy to understand how five different

stories could come out of a single press conference, through no fault of the reporters involved."

To minimize confusion and confusion in information provided to the public, Met-Ed and GPU decided, following the press conference on Monday, April 2, to have all future statements on (1) what happened, (2) the levels of radiation coming from the plant, (3) the measures Met-Ed, GPU and NRC engineers were taking to control the reactor, and (4) all other technical information come from a single source - the NRC.

#### Evacuation Planned

Evacuation was a very serious consideration by Governor Thornburgh after the discovery of the hydrogen gases in the primary system and because of possible continued radiation releases. Fear of an explosion in the reactor's confinement structure caused the Governor's action. Subsequent information has proved there never was any danger of such an explosion. However, actions were taken to protect the public based on information available at the time.

Thousands left their homes voluntarily. Many stayed, however, and waited for further announcements from the Governor before taking action. The Civil Defense has estimated that as many as one-fourth of the region's 950,000 residents may have left the area, although it was difficult to get an



*Governor Thornburgh (left) and President Carter are escorted by a Met-Ed employee into the Unit-2 control room on Sunday, April 1.*

accurate number because there were so many sporadic moves.

#### President Visits the Site

President Carter became concerned about the confusing reports and resulting uncertainties among central Pennsylvania citizens. He announced he would personally visit Three Mile Island on Sunday. His visit was interpreted as being not only a mission to learn firsthand what was happening, but also as a gesture to reassure the people of the area that there was no immediate danger.

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## STUDIES ON RADIATION EXPOSURE UNDER WAY

According to Joseph A. Califano, Jr., secretary of the Department of Health, Education and Welfare (HEW), in his testimony before the Subcommittee on Energy, Nuclear Proliferation and Federal Services, projections about low-level radiation exposure to people living near TMI cannot yet be completely assembled. In his testimony on May 3, Califano identified some of the difficulties in refining and correcting estimates. These included: a) a limited number of instruments called dosimeters which measured ground-level radiation during the first three days after the accident, and b) a span of 12 hours before aerial readings were available to assist in projecting exposures. Therefore, a number of calculations had to be, and still are being, extracted from the collected data.

Despite these difficulties, however, Califano stated that radiation experts believe the Met-Ed dosimeters and Department of Energy aerial readings provide a reasonable basis upon which to estimate the dose to which the off-site population had been exposed.

Earlier Califano had stated that preliminary estimates indicated

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**In Retrospect**

Met-Ed has been accused of downplaying or not explaining the severity of the accident during the height of the crisis. At least part of the blame for this confusion must fall on the company's feeling that there was no immediate danger to the public and that it should not do anything to panic the local citizenry. In explaining why he didn't call for a general evacuation, Governor Thornburgh said that an evacuation, even an orderly one, would almost certainly result in injuries and possibly deaths and, in the absence of immediate danger, he saw no reason to risk this.

Nevertheless, the fact remains that some statements, made under the pressures of the first few days, which implied that the accident was less serious than it was, in retrospect, were incorrect.

Met-Ed was handling a situation which had never occurred at a commercial reactor before. Because things were happening so quickly, it was difficult to have timely communications while dealing with the immediate technical problems.

**INSURANCE COVERAGE EVALUATED**

Within hours of the accident, members of the nuclear insurance groups were making plans to provide full and rapid service to the people who might be affected. On March 31, the insurers had set up a local office in Harrisburg to process quickly any claims or requests for financial assistance from families or individuals who wished to evacuate the area, as recommended by the Governor.

"The first three or four days were the most difficult," said Donald F. Gourley, Harrisburg representative of the two insurance pools which provide liability coverage for the TMI-2 accident. "This was the first time we've ever had to do anything like this and we were not quite sure what to expect.

Priorities at the plant during the first few days after the accident emphasized maintaining the plant in a safe, operating condition, and minimizing the radioactive releases and off-site exposures to the public. In pursuing these objectives, the people most closely involved in the plant operations, of necessity, sometimes had to place communications second.

Governor Thornburgh commented on the role communications played in his office: "First, it was the key to our attempt to give the people a source of information in which they could have some confidence.

"We regarded the public reliability of the Governor's office as essential to our efforts to avoid a panic, as well as our efforts to implement, if necessary, an orderly evacuation."

When a crisis occurs, such as the one at Three Mile Island, the coordination of facts can be a major problem. Hindsight shows us at Met-Ed and GPU that there are several areas of improvement in communications, particularly as they apply to "crisis management" situations, which need to be made.

However, our first concern was to see to it that anyone covered in the Governor's advisory who needed immediate funds to pay for evacuation-related expenses had them.

"During the first month we distributed approximately \$1.2 million to local families and residents living within five miles of the plant and who had pre-school children and/or a pregnant woman in the household, as outlined in the Governor's advisory.

"In addition to taking claims in our own offices, we visited the evacuation center in Hershey offering financial assistance for motel rooms or meals for those who would have preferred to leave the centers."

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there would not be any additional fatal cancers from radiation to persons off-site within the 50 mile radius of TMI. Based on later calculations, HEW revised that estimate to two more deaths than the 325,000 normal cancer deaths expected in the two million population residing within that radius.

In his testimony Califano also explained the work of a special Task Force to do extensive research on the effects of low-level radiation, disseminate public information about the effects of radiation exposure, and give recommendations about ways of limiting public exposure.

**ACCIDENT DRAWS  
WORLDWIDE MEDIA  
COVERAGE**

In what has already proven to be one of the major media events of the decade, the accident at Three Mile Island (according to news accounts) attracted more reporters and newscasters from major newspapers, news magazines, wire services, and TV and radio stations than any other event in recent memory.

As events following the early morning turbine trip of Unit-2 on March 28 continued to unfold and as efforts to contain radioactive emissions to the environment intensified, hundreds upon hundreds of reporters representing local, national and international media descended upon Middletown, Pennsylvania to cover this first-of-a-kind accident in America. Cover it they did. Headlines and wire service stories abounded as did network program interruptions and extensive news telecasts and editorials.

In this post-Watergate era of investigative reporting, a majority of the media recognized its responsibility to provide balanced news accounts, although some saw opportunities to sensationalize and exploit public fears.

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**Liability Coverage at \$560 Million**

Gourley represents the American Nuclear Insurers (ANI), and the Mutual Atomic Energy Liability Underwriters (MAELU), two groups, which, between them, carry \$140 million in nuclear liability insurance coverage for the Three Mile Island station. ANI is a group of private insurance companies and MAELU is a group of mutual insurance companies.

The \$1.2 million dollars paid out by TMI-2's nuclear insurers comes from this nuclear liability insurance coverage.

**MEDIA COVERAGE-****CONTD. FROM PRECEDING PAGE**

In the face of conflicting reports emanating from the scene during the first several days and contradictory statements of officials and self-appointed "experts," confusion reigned. Efforts to communicate effectively were further impaired by the complicated jargon associated with nuclear power. Misunderstanding, misinterpretation and misuse of terms and statements played a significant role in the confusion reported after the accident.

All the while, requests for information, explanations and interviews continued to pour into the temporary communications facilities established by Met-Ed at the site and nearby Hershey. The thousands of calls soon after the accident spilled over to the entire GPU system, severely straining our collective ability to respond to the media.

As the complicated puzzle of how and why is painstakingly pieced together by state, federal and company investigations in the months and perhaps years to come, we can expect continued major media interest. The reason is clear. The entire nation has developed a very strong interest in TMI, the people it has affected, and the role nuclear energy will play in the nation's future.

The liability insurance covers all bodily injuries, property damage losses or similar expenses incurred by any member of the public which arise from a nuclear incident such as that which occurred at TMI.

In addition to the \$140 million available from commercial insurance companies, an additional \$335 million is available through a type of "self-insurance" program conducted by the operators of large (100 megawatts or larger) commercial nuclear power reactors. For each of the 67 reactors in the program, the operators are liable for a proportion of the coverage, up to \$5 million per reactor, to help cover the expenses resulting from an accident at any one of the 67. For example, because the GPU system has three operating nuclear reactors, it is liable for a maximum of \$15 million. However, this assessment program comes into play only after the first \$140 million is depleted.

There is an additional \$85 million in nuclear liability insurance available through a federal insurance program to which the GPU companies have been contributing. This would come into play only after the other insurance has been used. Thus, GPU has insurance coverage up to the limit of \$560 million, which is the present maximum liability required by federal law.

If damages exceed the \$560-million limit, Congress is required, by law, to "take whatever action is deemed necessary and appropriate

to protect the public from the consequences of a disaster of such magnitude. "

**Property Insurance**

GPU carries \$300 million, the maximum available, on the TMI station. This coverage is provided by ANI and by Lumbermans Mutual, which is reinsured by a third insurance group, the Mutual Atomic Energy Reinsurance Pool (MAE RP).

The property insurance covers real and personal property located at TMI. Included in this coverage are damage to any of the existing equipment, expenses for normal clean up, including decontamination, and damage to the nuclear fuel core.

The greatest single uninsured cost from TMI is the cost of replacement energy to make up for the lost generation from the two TMI units. Replacement energy costs are estimated to be approximately \$24 million per month. Insurance to cover these costs is not available.

While company officials are unable to make accurate estimates of the damage which may be covered by insurance, nuclear insurance representatives have predicted that maximum insurable losses from the TMI-2 accident will be less than that provided by existing coverage.

As of May 9, GPU had received \$19.9 million in property insurance payments.

**FINANCES BECOME KEY ISSUE****ACTIONS BY THE PUCS**

The outcome of the proceedings now underway before the Pennsylvania Public Utility Commission (PaPUC) and the New Jersey Board of Public Utilities (NJBPUC) is the key element in determining the future ability of the GPU companies to serve their customers. The PaPUC has revoked Met-Ed's

and Penelec's previously granted rate increases. The NJBPUC has not yet acted on JCP&L's request for a \$113 million increase in energy adjustment charges.

Six days before the TMI-2 accident, on March 22, Met-Ed had been granted a \$49 million retail

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rate increase by the PaPUC. The new rates were to go into effect on March 29, the day after the accident. On the 29th, however, the PaPUC postponed action on the matter until April 11.

On April 17, representatives of Met-Ed and GPU appeared before the Commission, recommending that the \$49 million increase - already approved - be cut by \$16 million pending the results of a study of the effects of the TMI-2 accident. GPU Chairman William G. Kuhns explained that this offer reflected the company's position that a sharing of the burden of the accident among investors, customers and employees was necessary.

Two days later, the PaPUC established temporary rates for Met-Ed that, in effect, revoked the \$49 million increase and rolled back the company's rates to the levels in effect prior to that order.

On April 25, the PaPUC reduced the rates of Penelec by \$25 million, while establishing temporary rates to extend for a six-month period. Penelec had been granted a \$56.2 million rate increase in January 1979, of which \$26.4 million was to cover the firm's 25% ownership of TMI-2. Penelec, on April 30, filed revised rates with the Commission to reflect the \$25 million cutback effective April 25.

Beginning May 2, the PaPUC began hearings covering the effects on rates of the unavailability of TMI-2. Evidentiary hearings were held on May 2, 8-9, 22-23 and 29-30 at Harrisburg and on May 14 in Reading. Non-evidentiary hearings at which customers could make statements, were held during evening hours on May 8, in Harrisburg and May 14, in Reading.

JCP&L filed a request May 4, seeking a \$99 million increase in levelized energy adjustment clause revenues to help cover replacement energy costs resulting from the TMI-2 accident.

An additional \$14 million will be required to cover related revenues taxes, raising the total to \$113 million, a 17.6% increase over current revenues. This request does not, however, cover the total energy replacement costs that JCP&L is expected to experience. The company has reduced its request by half of the revenues required for the return on common equity investment allowed to JCP&L in TMI-2.

Earlier that same week, the New Jersey Public Advocate called for a freeze in the level of gross receipts and franchise taxes which had to be paid by JCP&L. "A freeze ... would help ease the financial burden on JCP&L customers," he said.

The hearings before the two state commissions presently are continuing.

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#### SECURITIES RATINGS

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The accident at TMI-2 had an impact on the ratings of the securities of Met-Ed and of Penelec, as well.

Moody's Investors Service and Standard & Poor's Corporation are the investment community's most prestigious sentinels. Moody's gave its judgment first. On April 19, the same day on which the PaPUC revoked Met-Ed's \$49 million rate increase, Moody's suspended its ratings of that company's preferred stock and debt securities. In addition, it reduced Penelec's ratings for first mortgage and pollution control bonds from A (upper medium grade) to Baa (medium); its debentures from Baa to Ba (medium low) and its preferred stocks from "baa" to "ba".

Moody's retained the ratings of JCP&L's publicly held securities.

The rating service said the actions reflected "the unresolved problems created by the nuclear malfunction and the numerous unanswered questions concerning the ultimate magnitude of the financial liabilities...".

Four days later, Standard & Poor's (S&P) announced that it had lowered the ratings on Met-Ed's outstanding first mortgage and pollution control revenue bonds to BBB (medium) from A (upper medium grade) and moved debentures and preferred stock to BBB from BBB.

At the same time, S&P re-affirmed the ratings of Penelec's first mortgage bonds (BBB) and preferred stock (BBB) and Jersey Central's first mortgage bonds (A-) and preferred stock (BBB).

Again, the financial implications of the TMI-2 accident were cited as the basis of the re-rating of Met-Ed's securities.

S&P did mention, however, that while regulatory actions would be of major significance in its ongoing analysis, "we expect management's actions and financial policies to continue to support credit quality." S&P also commented that it anticipated regulatory treatment to be responsive. "

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#### GPU SEEKS CREDIT

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GPU announced on April 26, that it was negotiating with a group of banks for a revolving credit agreement of \$450 million for the GPU system. The company also said that it was discussing with underwriters the possible issuance of securities of GPU's subsidiaries and that applications had been filed with the regulatory agencies.

On May 1, GPU and its subsidiaries filed with the U.S. Securities and Exchange Commission for permission to issue, sell and renew promissory notes, from time to time, for a total of up to \$500 million. The notes would have a maturity of not more than six months.

The total amount of the notes outstanding at any one time would not exceed \$500 million, a figure which would allow the GPU sub-

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subsidiaries to borrow up to the following amounts: JCP&L, \$139 million; Met-Ed, \$90 million; and Penelec, \$116 million. The parent company, GPU, would be permitted to borrow up to \$150 million at any one time.

Because of the need for cash resources to pay for replacement power (currently estimated at \$24 million per month) and other TMI-related current expenses, the GPU companies need short-term bank

put up the common stock of Penelec and JCP&L.

Graham stressed that to assure the company's financial viability, the PaPUC would have to pass along to customers some of the cost of the accident quickly. Without such a reassurance, he explained, bank credit would not be available in the coming weeks for Met-Ed to continue in business. The other companies would also be severely affected.

of 17-7/8 (\$17.88), closing at 17-3/8. In the weeks since the accident, stock value has decreased slowly but steadily under record levels of trading volume. On May 14, the stock dropped to a low of \$8.50 per share, a 50% loss.

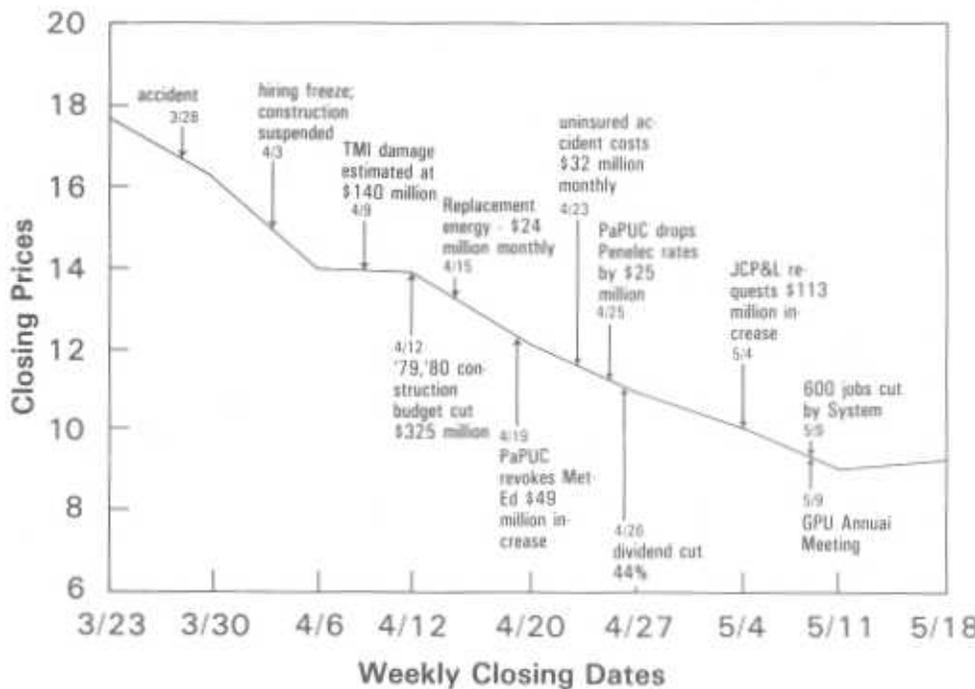
**Dividend Cut**

In addition, the stockholders' quarterly dividend was reduced by 44%, from 45 cents to 25 cents. This was the first time in GPU history that a dividend had been reduced. The reduction was particularly difficult because of the importance of the dividend to the stockholders. In a survey last year, over 90% said the reason they owned GPU stock was for the dividend or a combination of the dividend, plus long-term growth.

The same survey showed how difficult it is for the GPU stockholder to absorb such losses. The average stockholder age is 65, with two-thirds retired or within five years of retirement. Median total family income is in the \$15,000 - \$30,000 bracket and one-sixth earn less than \$10,000 annually. Moreover, they are a loyal group, with more than half owning GPU stock for over five years.

That many shareholders may have become jittery over their investment can be inferred from the extremely high volume of trading in the stock. April volume was over 10 million shares, 10 times greater than the April 1978 volume. Of the 2,123 securities listed on the New York Stock Exchange, GPU was the single most actively traded stock in three of four weeks in April. May volume decreased somewhat, but GPU can still usually be found among the five or ten most active shares.

**GPU Weekly Stock Prices (3/23 - 5/18) vs TMI Accident Chronology**



loans to see them through this period. Company officials have stated that such loans are absolutely necessary for GPU to continue serving the electric energy needs of all of its customers.

In testimony before the PaPUC, May 2, GPU Treasurer John G. Graham said tentative commitments for \$115 million have been received from Citibank and Chemical Bank. He also said the company is seeking an additional \$285 million from 20 other major banks, and \$50 million from smaller regional banks. As collateral for the loans, GPU has to

Negotiations with financial institutions and presentations before the PaPUC and NJBPU are continuing on an on-going basis.

**STOCKHOLDERS HIT**

The people who may be suffering the greatest single loss are the ultimate owners of TMI, the GPU common stockholders. They have seen the value of their investment drop by about \$550 million since the accident and have experienced the first ever GPU reduction in its dividend rate.

On the day before the accident, GPU common stock reached a high

**CUSTOMER IMPACT**

Customers of the GPU system companies are awaiting the results of the pending rate cases before both the Pennsylvania Public Utility Commission and the New Jersey

Board of Public Utilities. The outcomes will affect not only GPU's customers but all consumers across the nation.

Although the customers will definitely feel a pinch if the rates are increased, the ultimate impact on them could be worse if the rate increases are denied.

Electric utilities are regulated on a cost-of-service basis. The earnings which common stockholders receive represent little more than interest on a bond. All the economies achieved from the application of new technologies and improved productivity are passed along to customers.

The typical electric utility company has a capital structure of about 50% debt - 15% preferred stock and 35% common stock equity. The amount of senior securities of a utility, as compared to a non-regulated industrial company, is very high. The overall cost of capital is thereby reduced, and the rates charged to customers reflect that reduction. In a capital-intensive industry such as electric utilities, the cost of capital is an important component of the total cost, and therefore of the price that must be charged for electric service.

If GPU stockholders are required to absorb all the fixed charges associated with the investment in TMI-2 for the period that it is out of service, the market for all securities of electric utilities throughout the nation is likely to be seriously affected.

An economic consulting firm, National Economic Research Associates (NERA), has stated that, according to their preliminary studies, if this situation were to develop, it would result in a 20% overall increase in the cost of capital, which would ultimately have to be borne by the customers.

In the GPU system, capitalization is now approximately \$5 billion and the overall annual cost of capital before the TMI-2 accident was about 10% per year, or

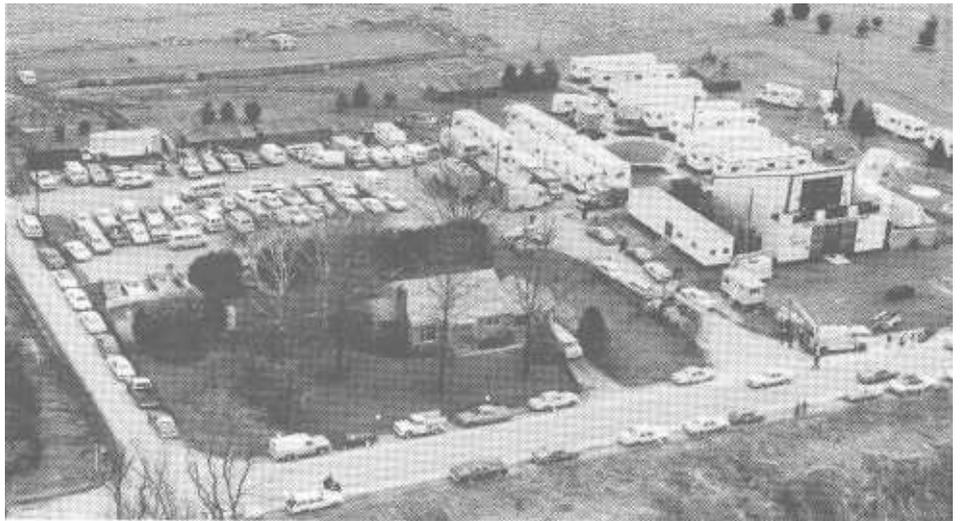
approximately \$500 million per year. A 20% increase in the cost of capital would mean an increase in capital costs of \$100 million per year and very substantial increases in tax costs. Such increases would continue indefinitely.

By contrast, the additional costs of capital involved in TMI-2 while it is out of service would be for a

finite period, perhaps two to four years.

If this concept is expanded to include those electric utility companies throughout the nation which have some nuclear capacity, a 20% increase in their cost of capital, according to NERA, would be an annual additional cost of \$2 billion per year for the indefinite future.

## THE TMI EXPERIENCE



*An aerial view shows Trailer City surrounding the TMI Observation Center in the bottom right corner.*

### TRAILER CITY

On a tract of underdeveloped land across the river from Three Mile Island's Units 1 and 2, a modern day boom town, Trailer City, arose. This "city" was the base from which hundreds of people worked to bring the TMI-2 reactor to a shutdown.

The unique combination of trailers, mobile homes and army tents generated as much interest as the plant itself. People from around the country parked on the side of Pennsylvania's Route 441 to witness the recovery operation.

The mess tent, a huge army one, was a 24-hour operation. Because of the staggered hours, the caterers served breakfast and dinner at the same time. Called the "Timbers", the tent provided a place (for the TMI support team) to unwind and relax, even if for only a short time.

The spaces between about 35 trailers formed the streets and walkways of Trailer City. Inside these trailers a cross section of nuclear experts and support people—the security section, NRC representatives, communications personnel, GPU system technicians and administrative people, experts from other utilities, representatives from state and Federal government agencies, and personnel from the nuclear industry—were included among the estimated 500 people who were citizens of Trailer City.

"This reminds me of M\*A\*S\*H," commented one employee. "People are running around trying to get a job done. And there's a lot of coffee to get us through the 12-hour-a-day schedule."

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Just after the Easter holiday, plans to move Trailer City on-site at TMI were made. The move was completed in about a week, with the NRC trailer relocated outside the Middletown, Pennsylvania municipal building.

For those who worked at the original Trailer City, however, it is the one they will always remember.



*Hundreds of employees ate at the Timbers during the TMI recovery operation.*

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#### WORKERS MUST EAT

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It looked like a scene from a movie. Two men walked into a fast food restaurant and ordered 400 pieces of fried chicken to go. But this wasn't a movie scene, and the men weren't acting. They were Elmer Frankhouser and Henry Weimer of the Consumer Services office in Met-Ed's Lebanon Division, and they were on a mission to get food for the many workers who had gathered at the TMI site following the accident on March 28.

Feeding approximately 1,000 people a day was just part of the logistics of the TMI operation. A dedicated group of eight employees had been feeding those workers since the first hot meal was served in the food tent at Trailer City on April 4.

Before the tent was set up, workers at Trailer City consumed 11,000 sandwiches, purchased mostly from local fast food chains and restaurants. According to Henry, the local merchants were very cooperative. "We would go into a store or restaurant and sometimes buy everything they had in stock. Then we'd charge it with no questions asked."

Between the time the food tent was set up and mid-May, a total of between 65,000 and 70,000 meals had been served. Although meals were served around-the-clock (originally), the tent was open for meals only during scheduled hours. They also delivered meals to about 60% of the workers on the Island, who could not leave their stations.

The caterer, who supplied not only all the food, but also up to 35 people at a time to help prepare and serve it, brought all of his own equipment to the site. The caterer also closed down the main branch of his business to serve TMI exclusively.

Although everyone had been putting in long hours under somewhat primitive conditions, morale remained high. Henry said he hadn't felt better in 10 years, "probably from working outside. .

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## TMI AFTERMATH - MANY REACTIONS

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#### PUBLIC OPINION

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In the aftermath of the TMI-2 accident, public support for nuclear power throughout the nation has declined somewhat. A majority of the public still favors nuclear power, but by a smaller margin than before. This is as true in the TMI area as it is nationally.

Pennsylvania's Elizabethtown College, in a telephone survey of residents living within 15 miles of TMI, found that the plant's neighbors continued to support nuclear power and also favored continued operation of TMI-2.

Some 375 residents were polled at random and a 62% majority continues to support nuclear power, with 58% favoring continued operation of Unit-2. However, 43% did say that they were less favorably inclined toward nuclear power than they were before the accident, and 80% said nuclear plants should be more strictly operated.

The survey also found that 49% approved of news media coverage of the accident. A 69% majority approved of the government's handling of the events, but 52% said the public has not been told the entire truth.

#### Polls Still Show Support

An ABC/Harris poll, conducted just prior to President Carter's nationally televised energy message, showed that the public supports "the building of more nuclear power plants in the United States" by a 52-42 margin. This represented a sharp increase in opposition, particularly in the East, where more nuclear plants were opposed by a 50-44 margin. The ABC/Harris poll showed, however, that the public still supports more nuclear plants in the Midwest (58-36), in the South (54-39), and on the West Coast (51-44).

A *New York Times*/CBS News poll, also taken following the Three

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Mile Island accident, showed that the "ambivalence of the public is obvious." The survey found that the public favors further development of nuclear energy by a 46-41 margin. This was a sharp drop from the 69% support of two years earlier. "But when asked if they would rather pay higher prices for foreign oil, nuclear won, 2 to 1," the *Times* noted.

Particularly noteworthy was the much stronger opposition to nuclear power given by women, only 28% of whom favored constructing a nuclear power plant in their community, compared with 49% of the men.

#### Opinion More Cautious

An opinion survey taken by *The Washington Post* showed a "slight shift in public sentiment" as residents of the Washington, D.C., metropolitan area continued to favor nuclear power by a 38-28 margin, versus 38-18 prior to the Three Mile Island accident. "Go nuclear, but with as much care as possible, was the clear majority theme, often articulated in volunteered comments from those interviewed," *The Post* said.

"Ordinarily, public opinion is sharply swayed by especially jolting events. Sentiment leans heavily toward capital punishment after horrid, highly publicized murders," *The Post* noted. "But if reaction from Washington area residents is typical, then the events in Pennsylvania may have resulted in only a slight national shift in attitudes toward the need for nuclear power," *The Post* concluded. Of those polled, 97% said they had heard of the Three Mile Island accident, and 85% said they had been following it very closely or somewhat closely.

In the nation's first public vote following the Three Mile Island accident, residents of Austin, Texas voted to retain the city's 16% share in the South Texas Nuclear Project and authorized the selling of \$215 million in bonds to cover



### THE UNKNOWN EMPLOYEE

He came from Met-Ed, Penelec, JCP&L, GPUSC. She left her home, family and friends. He worked long hours in the office. She handled the extra work load. Who? It could be any one of us.

Hundreds of employees from across the GPU system left their regular jobs and their homes to work on-site at TMI following the March 28 accident. They were technicians working to bring the plant under control, they were officers working to coordinate the situation and keep the system on an even keel, and they were all the people who provided the various support services.

Some traveled hundreds of miles and lived in motels for weeks at a time. They worked 16-hour days, seven days a week.. But not everyone went to the site. Those who stayed behind also worked long, hard hours covering the jobs of those who went to TMI, doing the work that still had to be done at home and picking up the extra burden which TMI caused.

They received little recognition, but they were needed. Their jobs were not glamorous, but they were vital. They may not have been thanked personally, but without them and their dedication the work could not have been done.

In recognition of this extra effort, GPU Chairman William G. Kuhns sent a letter to all GPU system employees on behalf on the GPU Board of Directors. It stated in part:

"...the Board wishes to commend the employees for their outstanding service to the Corporation and to the Public..."

#### DEWEY SCHNEIDER'S HQ USE

"I've worked here for 39 years. I've been through two floods and the strike in the 1950s. I thought I'd just ease out at retirement. But this is the biggest thing that's happened to me."

The accident at TMI has affected each GPU system employee. It has affected the company's customers and stockholders. One person who was affected directly from the first day of the accident was Edward J. (Dewey) Schneider, district manager, Met-Ed's Middletown Line Department.

Dewey Schneider, his wife, 16-year old son, and miniature poodle left their home, located next to the TMI Observation Center, the weekend of

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March 30. They moved out so that their home could be used as a base of operations for the many company technicians and officials who arrived at TMI immediately following the accident on March 28.

Their basement became the office of the Manpower Resources group. The laundry room became a darkroom. And until the food tent was set up, their garage served as a cafeteria.

"Dewey's house" became a term almost as familiar as "TMI" has become around the nation. Even President Carter's secretary called his house when arrangements were being made for Carter's visit to TMI.

Dewey said he and his family, who were housed at the Hershey Motor Lodge during this time, had adjusted fairly well to motel living. "My wife was pretty good the first three weeks. Then she started to miss cooking and doing the housework." Their son, however, became a little spoiled. "He really liked using the pool and tennis courts."

Dewey's family had to cope even before they moved to the motel, however. Reporters began converging on their home Wednesday evening. "I think my wife handled the situation very well." One photographer asked Mrs. Schneider and her son to pose looking toward the Island. She asked what the caption would be and was told, "Mother and son looking apprehensively toward the cooling towers."

"But we're not apprehensive," she told the photographer. "We know some of the people who work at TMI, and we have confidence in them." The photographer did not take the picture.

Dewey said his wife was a little disappointed when they had to leave the house because "she hated leaving the scene of the action. She and Harold Denton's secretary were serving sandwiches to everyone at one point, and she felt involved."

Their son's life was affected, too. He has become a minor celebrity at school since his picture has appeared in several papers. And he receives some good-natured kidding from his classmates, who ask if he "glows in the dark."

The Middletown Line Department, which worked around the clock stringing wire to bring electrical power to TMI, is about 75% back to normal according to Dewey. "Although," he said, "I don't know if we we'll ever really get back to 'normal' again."



*Dewey Schneider and his house have become by-words at TMI.*

# TMI THE RECORD

Today the name Three Mile Island is associated with, at best, the worst nuclear accident in the history of the American nuclear power industry. However, prior to the morning of March 28, the Three Mile Island station represented one of the top accomplishments of the nuclear power industry.

During the 4-1/2 years it has been in operation, TMI-1 has operated at an exceptionally high capacity factor. When compared to an oil-fired base load unit, TMI-1 has saved the customers of the GPU system more than \$300 million through its production of low-cost nuclear electricity. If we consider fuel costs alone, the figure would be much higher.

The early operating record of TMI-2 showed similar promise. Despite some problems uncovered during the start-up testing program, Unit-2, once put into commercial operation, did extremely well. Prior to its accident, Unit-2 had compiled a 1979 capacity factor of 69%, slightly above average for all nuclear plants and well above average for a new unit just coming on line. By the end of March, TMI-2 had already saved GPU system customers about \$49 million in energy costs.

## Early History of TMI

Although the evaluation of potential sites and alternative generation had been going on for some time, the "official" history of TMI could probably open in January 1967, when Three Mile Island on the Susquehanna River was selected as the site for what would become the GPU system's second major nuclear unit (after Oyster Creek in New Jersey). The preliminary safety analysis report (PSAR) was filed in May of that

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the increased construction costs of the project.

In his nationally syndicated column, pollster George Gallup wrote in mid-April: "Although more Americans now favor caution in the construction of nuclear power plants, a solid majority continues to feel it is important to develop nuclear power to meet the future energy needs of the nation." Despite this majority, many Americans expressed concern about nuclear power. Of those polled, Gallup reported that after the Three Mile Island accident, only 25% favored shutting down all nuclear plants.

When asked if they would be comfortable living next to a nuclear plant, 62% said they would oppose having a plant near their home, compared with 45% surveyed in 1976. However, Gallup concluded saying that "despite these worries, the American people are not ready to reject the use of nuclear power for future energy needs."

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ACCIDENT SPOTLIGHTS  
NUCLEAR ISSUE

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The political reaction to the accident at TMI-2 has been generally predictable. The accident sharply increased the opposition of those opposing the development of nuclear power, and has somewhat dampened the overt enthusiasm of the industry's supporters. Some of those who were uncommitted prior to the TMI accident are now inclined to be more skeptical.

Many nuclear supporters have had to qualify their public statements to include the admission that the nuclear industry must proceed on a "go slow" basis.

Consequently, it seems that there are three predominant political camps forming as a result of the TMI-2 accident: (1) those who believe that we must continue with

the development of nuclear power, such as U.S. Representative Michael McCormack, chairman of the U.S. House's Subcommittee on Energy Research & Production, who said, "It [the TMI accident] scares the hell out of everybody; we go back and learn from it - but we don't quit..."; (2) those who regard nuclear power as an evil and will seek to completely eliminate its use and terminate its development; and (3) those who have adopted a cautious "wait and see" attitude on the issue. This last group now seems to be the largest.

#### National Scene

On the national level, the Carter administration has adopted a policy of continued support for the development of nuclear power, "with care and reason."

Senator Jacob Javits of New York noted the importance of nuclear power when he said, "The national interest requires that nuclear power be considered an element in our energy plans." While at the same time, Senator Edward Kennedy (D-MASS) wrote Energy Secretary James Schlesinger, opposing the effort by the administration to speed up the 10-to 12-year licensing procedure for nuclear power plants, saying, "It's more important to build these plants safely than to build them quickly."

Some political figures are now more openly opposing nuclear power. Senator George McGovern (D-SD) introduced a bill that would halt further licensing of nuclear plants and require safety checks on all existing plants. California Governor Jerry Brown has requested that several nuclear power plants in California be closed immediately and appears to be planning to use the nuclear issue as a principal campaign issue should he challenge Carter in 1980 for the Presidency.

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year and a provisional permit to begin construction was awarded 12 months later in May 1968. Approximately five years later, construction was completed and TMI-1 went into service on September 4, 1974.

Meanwhile, construction had been underway for several years on a second TMI unit. The original 1968 application called for a second unit at Oyster Creek. However, the central location of the TMI site and other advantages soon induced the GPU system to change the location and plan for a second TMI unit. TMI-2 received its provisional construction permit in November 1968, and its operating license in February 1978.

#### TMI Costs and Ownership

TMI-1, with a capacity of 800 megawatts, cost approximately \$400 million, or about \$500 per kilowatt. The 880-megawatt Unit-2, put in operation four years later, cost \$710 million, or nearly \$800 per kilowatt. The cost figures do not include the nuclear fuel cores.

Constructed by GPU Service Corporation and operated by Met-Ed, the TMI nuclear station is owned jointly by GPU's three operating companies: JCP&L -25%; Met-Ed - 50%; Penelec - 25%. Construction required nearly 18,000 man-years of craft labor and provided approximately \$350 million in construction payroll. During normal operation, the station provides employment for approximately 500 people.

#### The Significance of TMI

At GPU's 1979 Annual Meeting, a New Jersey stockholder described TMI as "a magnificent sight with towers silhouetted in the twilight... the day will come when we will again take great pride in that plant." However, TMI is important not as an edifice, not as a major investment, not even as a place of employment. Its great importance

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While *The Washington Post*, a newspaper reputed to have its finger on the pulse of Congress, feels that Congress, as a whole, is "slightly pro-nuclear", other analyses are not so certain. Obviously, it is the Congress of the United States that is so critically important since the states have little direct say in the regulation of nuclear power. To date, no real test on the matter has come up in Congress and the direction it will take is unclear.

#### Proposed Legislation

Two Congressional representatives from Pennsylvania have introduced bills that would restrict the utilities' ability to recoup losses incurred in a nuclear accident. Representative William Ritter's bill would prohibit any pass-through of purchased power costs (but would allow the Federal government to loan money to a utility at low interest rates); Representative Eugene Atkinson has introduced a bill that would protect a utility's customers from paying the cost of repairs and the cost of purchased power needed because of a nuclear power plant accident.

Congressman William J. Hughes of New Jersey has introduced legislation which would establish a federal committee to study the entire nuclear power issue. The bill would also establish a two year moratorium on the issuance of new permits for nuclear power plants.

#### On the State Level

The political reaction on the state level has largely mirrored the reaction on the national level. Here, too, legislation has been introduced that would limit the options of utilities in the event of a nuclear accident. Pennsylvania State Senator Michael O'Pake, from Reading, has introduced a bill that would allow a jury to decide if a utility had been at fault in a nuclear accident and if, therefore, the costs incurred should be passed on to the customers.

Nevertheless, the mood of the Pennsylvania state legislature seems to be one of caution with most members adopting a "wait and evaluate" attitude. They have organized a select bipartisan committee to evaluate what action they should take on the matter.

Pennsylvania Governor Richard Thornburgh, who has been praised for his handling of the accident, has expressed doubts on the future of nuclear energy.

The reaction in New Jersey has paralleled that in Pennsylvania in many ways. The general mood there, too, is one of caution.

#### Possible Effects

While the long-range political consequence of the TMI accident cannot be foreseen at this time, several things seem likely to occur:

- (1) The Price-Anderson Act, limiting the liability of a utility in the event of a nuclear accident, will be reexamined; Representative Morris Udall (D-AZ) is planning to do this through his subcommittee.
- (2) Congress will likely be more reluctant to approve a breeder-reactor program.
- (3) The growth rate of new nuclear plants will be greatly slowed, perhaps even halted entirely. At one time, it was predicted that, by the year 2000, over 500 nuclear plants would be on-line. Now, the Carter administration estimates that no more than 200 will be on-line by then.
- (4) Tighter federal controls over nuclear plants will be enacted by Congress.
- (5) Political figures at all levels will be keeping an even closer watch on nuclear power - and probably utilities in general.

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### INVESTIGATIONS

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The TMI accident has already involved the GPU system in more government hearings than anything else in its history. The first, actually a site visit by members of the House Nuclear Regulatory Subcommittee, took place on the Friday after the accident. No one is estimating when the last may take place.

The Pennsylvania Public Utility Commission was the first group to begin addressing the financial issues - and their first step was to deny Met-Ed the ability to initiate new service rates which were approved before the accident and which would have reflected the capital costs of TMI-2 in base rates.

Instead, the PaPUC made Met-Ed's pre-rate order rates temporary while it announced a new round of public hearings to determine who should bear the resulting costs.

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TMI-THE RECORD-  
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lies in the reliable low-cost electricity it has produced, and we hope it will continue to produce, for GPU customers.

While TMI-2's commercial operating record was too short to show anything but a promise of high reliability, TMI-1's reliability record is among the best in the nation. Its lifetime capacity factor is 77%, well above the national nuclear average of 68%. This is much higher than the national averages for base load coal-fired units (55%) or base load oil-fired generating units (51%).

Each month that the two units are out of service costs the GPU system (and ultimately its customers and stockholders) \$24 million extra to replace the electricity these two units would have been producing. Returning TMI-1 to service will save approximately \$14 million of this \$24 million monthly figure.

The Commission also ordered a \$25 million rate reduction for Penelec pending the outcome of the series of public hearings and an investigation into the TMI situation.

On the state level, too, the Pennsylvania legislature established a 24-member Select Committee to investigate, among other things, state government's response to the accident; and the Governor has also appointed a separate committee to look into the situation.

President Carter has commissioned a special panel to investigate the accident. The 12-member panel was directed to complete its investigation and issue recommendations within six months. It began its activities by touring the accident site on May 17.

In late April, the Federal Subcommittee on Nuclear Regulation of the Senate Committee on Environmental and Public Works began its round of hearings. Chaired by Senator Gary Hart (D-CO), the Committee has heard testimony from GPU Chairman William G. Kuhns, GPU President Herman Dieckamp, Met-Ed President Walter M. Creitz, Governor Richard Thornburgh and Pennsylvania PUC Chairman W. Wilson Goode, among others.

**Other TMI Investigations**

As of mid-May, in addition to GPU's own exhaustive review, other agencies which have announced investigations dealing with the TMI accident and its aftermath include:

- (a) Electric Power Research Industry (EPRI is the utility industry's main research arm);
- (b) Nuclear Regulatory Commission staff;
- (c) An independent Advisory Committee on Reactor Safety report (ACRS has set up a TMI ad hoc committee);
- (d) U.S. House Interior Committee's Subcommittee on Energy and Environment (chaired by Morris Udall);

- (e) U.S. House Government Operations Committee's Subcommittee on Environment, Energy and Natural Resources (chaired by Toby Moffett);
- (f) U.S. Senate Government Affairs Committee's Subcommittee on Energy and Nuclear Proliferation (chaired by John Glenn);
- (g) U.S. Senate Energy Committee (chaired by Henry Jackson);
- (h) U.S. Senate Labor and Human Relation Committee's Subcommittee on Health and Scientific Research (chaired by Edward Kennedy) before which JCP&L President Shepard Bartnoff appeared April 4;
- (i) U.S. House Armed Services Committee (civil preparedness/civil defense at TMI - chaired by Melvin Price);
- (j) U.S. House Science & Technology Committee's Subcommittee on Energy Research & Production (chaired by Mike McCormack);
- (k) N.J. Board of Public Utilities (to hold a series of public hearings on the TMI situation).

These 16 groups are those that have already announced plans to look into TMI. Others (such as the General Accounting Office) have indicated an interest but have not committed themselves.

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**TMI LAWSUITS  
LITTER LEGAL LANDSCAPE**

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Another aftermath of the accident involves lawsuits. By early May, six class action lawsuits had been filed against GPU and GPU's three operating companies, who jointly own the Three Mile Island station. The lawsuits claim third party losses resulting from the accident at TMI-2.

The claimants are seeking reim-

bursments for such things as personal and business income losses, devalued real estate, endangered health and "diminution of the enjoyment of life." At least one of the lawsuits claims that damages to the class represented may be at least \$560 million, the legal liability limit and the limit of GPU's insurance coverage for such losses.

One claiming greater damages is the billion dollar class action lawsuit brought by nationally known attorney, F. Lee Bailey, against the plant's manufacturer, Babcock and Wilcox (B&W).

**GPU Keeps Legal Options Open**

GPU has sent a letter to B&W indicating that it is retaining its right to take legal action against them in the future.

The company recently indicated that it was prepared to undertake legal action if it would mean reducing the accident costs which would have to be borne by CPU's customers or stockholders. Both GPU and the NRC have indicated that mechanical and design failures contributed to the occurrence and magnitude of the accident.

**State, Federal Groups  
May Also Sue**

According to published newspaper reports, the Pennsylvania Department of Justice is evaluating whether or not the state should join the legal fray and sue to recover the state's expenses incurred because of the accident. Attorneys for the NRC are reviewing their situation to see whether or not they should also try to recover their expenses from the accident and, equally significant, are assessing the Agency's legal position in case someone accuses the NRC of having negligently supervised the TMI operations, and thus contributed to the accident itself.

## **THE FUTURE**

There is a big job ahead of us with respect to distributing the burden of the costs associated with the TMI-2 accident, to reestablishing our credibility, and to returning TMI-1 to service.

Long-term considerations include resumption of our construction program-not only of nuclear plants (Forked River), but of our other generating and transmission facilities as well.

It will take the dedicated thought and effort of all of us to achieve reasonable solutions to each of these areas.



GENERAL  
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CORPORATION

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**Penelec / GPU**

**JCP&L / GPU**

**Met-Ed / GPU**

**GPU Service**