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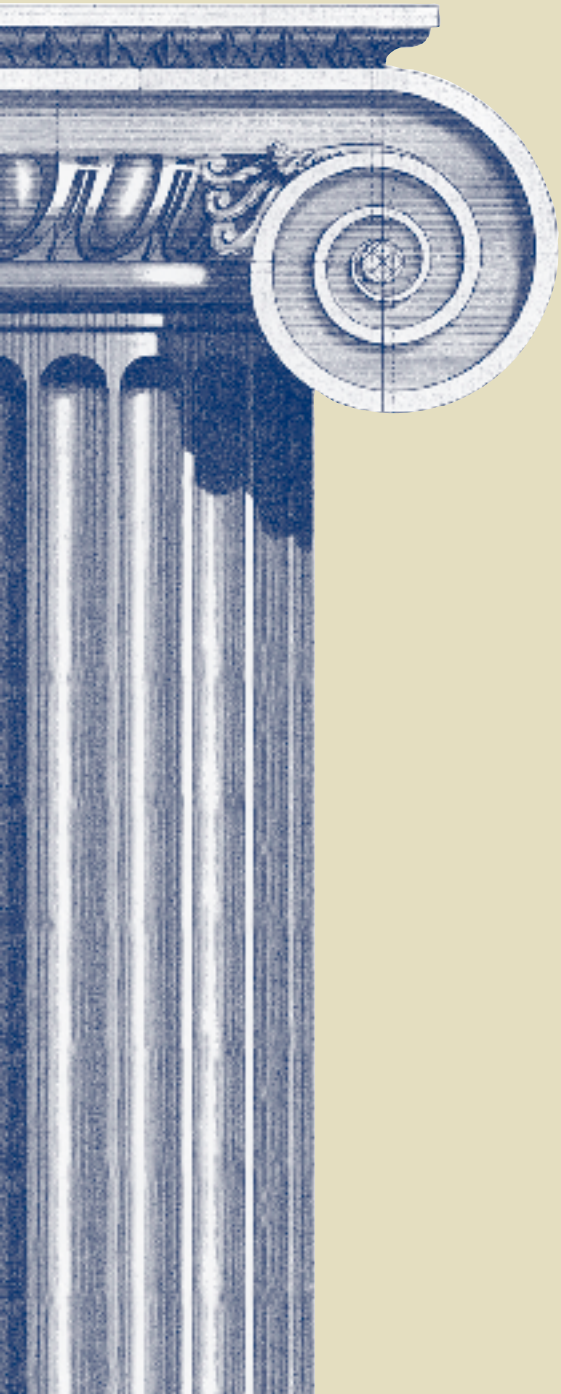

UNIVERSITY OF PITTSBURGH
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case study

Decision-Making under Uncertainty: The Three Mile Island Nuclear Accident from Multiple Perspectives

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and Carrie Miller
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THE POLICY PROBLEM

The responsibility for public safety and welfare falls unevenly on officials with different levels of authority who are accountable to competing audiences that use different metrics of time, threat, and cost. The challenge for public officials is to determine what exactly are the parameters within which choices for action can be made and still garner the support of a sufficiently broad coalition of constituents to support collective action. The choice of parameters is made more difficult when action requires the cooperation of private sector organizations that are responding to a narrower set of goals to ensure continuity of business operations, as well as the support of nonprofit organizations that articulate a particular set of values to serve the public interest. The challenge is further magnified when the problems confronting a community are urgent, uncertain, and potentially life-threatening.

The accident at the Three Mile Island (TMI) nuclear power plant on March 28, 1979, created exactly such a set of urgent, uncertain, and potentially life-threatening conditions for the population of Dauphin, York, and Lancaster Counties in central Pennsylvania. Many actors were involved in this complex event, but four institutions and the officials in those institutions emerged as key decision-makers in the progression of events that led eventually to a cold shutdown of Reactor #2. A fifth group of people, who held no official position, forcefully articulated a point of view that was based on existing scientific knowledge that could not be disregarded in the public debate. This set of decision-makers operated within a range of options that left them with little choice but to craft a strategy of action based on the information available. They could not delay action at peril of precipitating severe danger to the residents of the area in the immediate vicinity of the Three Mile Island nuclear power plant.

Developing a viable strategy of action, given the grave threat from the nuclear power plant in their community, was the primary charge to all five policy-makers. This case provides an opportunity to retrace the exchange of information among these five actors and to redraw the boundaries of the constraints and opportunities that each faced in order to achieve a more coherent and efficient strategy of action for the community.

The case poses a set of basic questions that may be applied to other instances of decision-making under uncertainty. It offers the readers an opportunity to review the information available, to reset the parameters for individual action in order to consider broader strategies of action that would benefit the public interest, and to adjust experimentally the relationships among the actors in order to reach a broad coalition of support for collective action. This process will necessarily require an exchange of information among the actors and the creation of new patterns of communication that did not occur during those fateful days, March 28–30, 1979. The exercise, however, allows the participants to hone skills of decision-making in complex arenas, using data from an actual case that may be applied to future cases of even greater complexity and threat to public safety and welfare.

THE CONCEPT OF A "SMALL WORLD" NETWORK

The organization of the materials in this case proceeds from a theoretical perspective regarding decision-making under conditions of uncertainty. This perspective depends upon a conception of public decision-making as evolving through a dynamic network of individual and organizational connections, rather than a hierarchical ordering of laws, rules, and regulations. In this perspective, the flow of information between individuals within organizations, and among different organizations, serves as the driving force for policy change and adaptation, as the conditions that the laws are intended to regulate are changing faster than the public authorities anticipated. At critical points, the policy-makers may face actual events for which there is no directly applicable legal guidance, but in which they must take action to protect their respective communities. This is a classic case of "decision-making under conditions of uncertainty."

What are the guidelines for action under conditions in which the problems are uncharted or the existing rules inadequate? The concept of a "small world" network offers a basic approach for analyzing information flow and decisions for action in complex environments. A "small world" network (Watts 1999, 2003) assumes that information travels through interactions among many actors, but

that some actors have more contacts and greater influence than others, and that some information is viewed as more critical by these actors and is passed more quickly to their neighbors than other types of information. Consequently, it is possible to identify the structure through which information travels and the "core nodes" in this structure. This structure can be both social and technical, and in most cases involves a combined, or "socio-technical" construct. Equally important, it is possible to identify the "core information" that leads individuals and organizations to take action. In practice, theorists assume that it is possible to share critical information quickly through a very large network of actors transmitted via a small number of key nodes. Such a mode of decision-making can be especially effective in crisis conditions.

The key task for decision-makers faced with rapidly changing, uncertain conditions becomes the identification of the "core information" on which to base collective action, and the "core nodes" that transmit or exchange this information. In the brief chronology of the TMI events that follows, five policy-makers struggled to determine the "core information" on which to base public action. Some had more legal responsibility than others; some had more access to scientific knowledge than others; some faced greater economic and political costs than others; and some had more strongly held positions on public responsibility than others. Yet, each faced the certain knowledge that he could not act alone and that genuine leadership depended upon articulating a strategy of action that the wider public could understand and accept.

THE CASE: THREE MILE ISLAND, MARCH 28–30, 1979

This case is designed as a hypothetical exercise in decision-making under conditions of uncertainty. The roles and basic assumptions of five actors who were directly involved in the chain of decision-making in reference to the Three Mile Island accident are outlined briefly below. An abbreviated chronology that describes the actual sequence of events follows the characterization of the actors. There are different strategies that could have been followed by each of the five actors had they increased or decreased their performance in information exchange. Each strategy reflects a different allocation of energy and action

to serve the public interest and a different calculation of loss or gain for the participants. The challenge is to identify first the "core information" and second the most efficient means of sharing this core information that would lead to responsible collective action for the affected population. A basic set of questions guides this exercise:

1. What is the "core information" that was vital to determine a responsible strategy of action in the first 72 hours after the coolant valve in Reactor #2 failed to close?
2. What were the "core nodes" through which this information flowed during the first 72 hours after this failure was discovered?
3. What were the gaps in the information flow that inhibited action? What were the bridges that facilitated information flow and action?
4. What were the methods that were used to distinguish "core information" from distracting events?
5. What is the most efficient process through which information could flow given a similar event at a future time and place?

THE ACTORS

Five actors emerged as active in the decision-making process to cope with the rapidly changing events in the first 72 hours following the discovery of the malfunctioning coolant valve in Reactor #2. Each actor represents a different level of authority, area of responsibility, and constituency, but the set of actors could devise, if they chose to do so, a coordinated strategy of action.

The Governor's Office

The roles of the governor and lieutenant governor of Pennsylvania in emergencies are intertwined. Consequently, this role will be described as the Governor's Office, assuming that the two persons who fill those roles with be acting in unison. While each role has multiple aspects, six aspects are selected for attention, review, and comparison among each of the key roles:

Decision-Makers:

- Dick Thornburgh, Governor
- William Scranton, Lieutenant Governor

Legal Responsibility:

- The Constitution of the Commonwealth of Pennsylvania, Article IV Section 2, states, "The supreme executive power shall be vested in the Governor, who shall take care that the laws be faithfully executed. ..." It continues in Section 7 to specify, "The Governor shall be commander-in-chief of the military forces of the Commonwealth, except when they shall be called into the actual service of the United States" (Department of General Services 1979).
- The lieutenant governor serves as the head of the State Emergency Council and transmits information from the Pennsylvania Emergency Management Agency (PEMA) to the governor on state emergencies. If the emergency requires a higher level of response, the governor declares a state emergency and requests federal assistance to the state. The governor also issues all evacuation orders except during a localized immediate crisis (Martin 1980).
- Both the governor and the lieutenant governor are responsible for the protection of the health and safety of the people of Pennsylvania.

Primary Constituency:

- All Pennsylvania residents

Secondary Constituency:

- Federal agencies, the president, and Congress

Primary Mode of Inquiry and Style of Communication:

- Direct questioning of multiple sources; prompt reports to the public based on the facts known at the time

Gaps in Information:

- Inadequate reports on technical status of the plant
- Inadequate knowledge regarding the scientific consequences of radiation on human health
- Inadequate knowledge of the capacity of local governments to protect their respective communities

Opposing Views:

- During his gubernatorial campaign, Thornburgh had actually supported nuclear power while at the same time stressing the importance of nuclear safety; he also strongly supported coal-powered energy.

Long-Term Goals:

- Governor Thornburgh created the Governor's Energy Council by executive order on July 19, 1979. Even before the official executive order was signed, Scranton was delegated responsibilities pertaining to energy issues with the idea that he would officially head the Governor's Energy Council. The council's goal was to ensure energy security for the commonwealth through planning, development, and conservation. The council's function was to develop short- and long-term energy policies through coordination with state agencies, local governments, the business community, and consumers. The council also acted as the primary recipient and coordinator of federal and private energy funds assigned to Pennsylvania and distributed such funds as needed to implement planning, energy conservation and research, and development of new energy sources (Department of General Services 1979).

The Nuclear Regulatory Commission (NRC)

Similar to the decision-making roles in Governor's Office, the roles of the chair and the director of the Office of Nuclear Reactor Regulation for the NRC are interrelated. The chair operated from the main office of the NRC in Washington, D.C., and the director of the Office of Nuclear Reactor Regulation was on scene at Three Mile Island and Harrisburg.

Decision-Makers:

- Joseph Hendrie, Chair
- Harold Denton, Director, Office of Nuclear Reactor Regulation

Legal Responsibility:

- The NRC performs the licensing and rule-making functions for the operation of nuclear plants in the United States. That is, the staff reviews plant applications and issues construction permits and operating licenses for new units.

- In March 1979, the NRC required two types of operators to be present at nuclear plants. One of the required positions was the reactor operator (high school graduate with a year of training on a simulator), and the second position was the senior operator (college graduate in engineering who must pass stricter tests). Federal law at the time did not require plants to have an emergency plan before becoming licensed.
- The NRC has the primary responsibility for assisting state and local governments in developing emergency response plans for radiological releases from nuclear facilities. The NRC has no authority either to require states to develop plans or to disapprove state plans once formulated. When the NRC is satisfied that a plan meets all the essential planning elements, it issues a formal letter of concurrence with the plan (United States General Accounting Office 1979).
- Working with the Pennsylvania Bureau of Radiation and Protection, the NRC is responsible for collecting and evaluating the facts attending an accidental release of radioactive material from a licensed nuclear facility (Scranton 1980). The NRC requires utilities to report violations of existing operating agreements and adjudicates the suspected violations. The NRC has the power to shut down a plant if it is not operating in a safe manner and will provide manpower resources in the event of serious radiological incidents (Starr and Pearman 1983).

Primary Constituency:

- The president, Congress

Secondary Constituency:

- The nuclear power industry

Primary Mode of Inquiry and Style of Communication:

- Technical reports and communication with experts

Gaps in Information:

- Inadequate knowledge of plant operations
- Inadequate knowledge of local area, communities, and organizations

Opposing Views:

- In theory, the NRC provides guidance and assistance to states preparing nuclear emergency plans and formally reviews state plans. In practice, the NRC assigned three professionals and one secretary out of 2,500 employees to work on emergency planning in 1979.

Long-Term Goal:

- Safe, sustainable operation of the nuclear power industry

Metropolitan Edison

The primary decision-maker for Metropolitan Edison was the president of the company, Walter Creitz, although his vice president, John Herbein, influenced his decisions. For the purposes of this case, the president is assumed to hold the most authoritative position.

Decision-Maker:

- Walter Creitz, President

Legal Responsibility:

- Metropolitan Edison (Met Ed) has the legal responsibility to comply with the rules and regulations for the operation of nuclear power plants issued by the NRC.
- The control room operators at TMI were licensed by the NRC and had been through six to 12 months of training, followed by lengthy oral and written examinations on the operation of Unit 2 at TMI. In addition, all TMI operators practiced on the simulator at least once every two years, although simulator training is not required for NRC licensing (Martin 1980).
- The plant had operated online commercially for three months in March 1979.

Primary Constituency:

- Board of Directors and shareholders of Metropolitan Edison

Secondary Constituency:

- Customers for retail service in the four cities, 92 boroughs, and 155 townships located within 14 counties in the eastern and central parts of Pennsylvania, with an estimated population of 830,000. The company also sold wholesale

electricity to five municipalities with a combined estimated population of 17,500, to an electric company serving substantially all of one township, and to a rural electric company corporation.

Primary Mode of Inquiry and Style of Communication:

- Limit inquiry to the specific incident and report only information that is required

Opposing Views:

- Citizens' groups had staged protests against the presence of a nuclear power plant since the initial construction of the Three Mile Island plant in 1967. Protests and hearings caused temporary delays in the opening of the plant, and citizens' groups voiced serious concerns regarding the safe operation of the plant within their community (Martin 1980).
- TMI had generated significant economic benefits to the central Pennsylvania region, with 500 employees earning an average of $20,000 a year—a $10 million annual payroll in 1979 (Froelich et al. April 4, 1979).
- "Met Ed pressed Unit 2 into regular service on December 30, 1978. By meeting the year-end deadline, the utility qualified for $17 to $28 million in 1978 tax investment credits, plus $20 million in depreciation deductions. It also got approval for a $49 million rate increase as ... there was strong incentive for the company to get that plant on line fast" (Unknown Author 1979, 24, 25 & 26).

Long-Term Goal:

- Profitable operation of a nuclear power plant

The Pennsylvania Emergency Management Agency (PEMA)

The primary decision-maker for the agency is the director, who also relies on his staff for information and judgment.

Decision-Maker:

- Oran Henderson, Director

Legal Responsibility:

- "Develop and keep current a comprehensive emergency management plan and program for the defense of the Commonwealth, designed to provide for the protection of life and property under both attack and natural disaster conditions" (Department of General Services 1979).
- "Issue planning guidance, coordination of state response to nuclear incidents, maintain emergency communications facility, operate state emergency operations center, emergency public information, coordination of state agencies and departments" (Scranton 1980).
- Manage an evacuation of the population, if ordered by the governor, including providing care for those who refuse to leave.
- Provide secure shelter for the governor in event of a radiation release (Myers 1979).
- In case of a nuclear accident, PEMA is notified by the plant and in turn, notifies:
  - Bureau of Radiation Protection (BRP) in the Department of Environmental Resources,
  - Counties within a five-mile radius of the plant (for TMI, these counties include Dauphin, York, and Lancaster), and
  - Other state agencies and neighboring states.
- Implement the course of action proposed by the BRP in response to the radiation release.
- Activate and manage the Emergency Operations Center in case of a state emergency, coordinating the operations of all state agencies with emergency responsibilities.
- Guide and direct counties and state agencies in their areas of responsibility during any kind of an emergency situation.

Primary Constituency:

- The governor's office and other state agencies

Secondary Constituency:

- The residents of Pennsylvania

Primary Mode of Inquiry and Style of Communication:

- Respond to requests and report actions to governor's office

Opposing Views:

- Counties and municipalities expected more direction from PEMA; their personnel lacked information regarding risk of exposure to radiation from the technical failure of a nuclear plant.

Long-Term Goal:

- Resilient communities capable of taking informed action when they are exposed to threat

Union of Concerned Scientists

The members exercise considerable power in decisions made by this organization, but the executive director articulates the position of the organization.

Decision-Maker:

- Daniel Ford, Executive Director

Legal Responsibility:

- The Union of Concerned Scientists (UCS) was founded in 1969 as an informal faculty group at the Massachusetts Institute of Technology. The group's activities include research, public education, and lobbying in support of public policy issues requiring scientific knowledge. The organization first became involved in the nuclear safety issue in the spring of 1971 by challenging the technical basis of the Atomic Energy Commission's performance criteria for the emergency core cooling systems of nuclear power reactors (Adato 1987).
- "Executive Director Daniel Ford and Nuclear Safety Engineer Bob Pollard had testified in congressional hearings on nuclear power twice in the two months before the TMI accident. ... In a report issued in January 1979, UCS recommended that 16 plants be shut down for repairs—including TMI Unit 2. ... Nine days before the accident, Ford faced a barrage of questions from Morris K. Udall (D-Arizona), chair of the congressional Subcommittee on Energy and the Environment. Udall asked for Ford's response to the nuclear industry's claim that 'all life involves risks' and that 'we are talking about unlikely events, that this probably will not happen.' Ford's reply was: 'My feeling, looking at the quality of performance, looking at the near accidents that occurred, is that the risks just look much, much higher than what would make any reasonable person comfortable' " (Fain 1999).

Primary Constituency:

- No established constituency
- Took efforts to protect and defend all people in the United States who could potentially be harmed by nuclear power generation

Secondary Constituency:

- The wider community of their scientific peers

Primary Mode of Inquiry and Style of Communication

- Press conferences where highly educated, reputable scientists would bring nuclear power plant hazards to the attention of the public
- Appearances on television shows, debating with plant and state officials about the dangers of nuclear power generation, the potential negative effects of exposure to radiation, and the sub-par safety history of the nuclear power industry

Opposing Views:

- In 1971, the UCS pointed to the absence of convincing experimental data on nuclear power generation systems. This lack of data led to the commissioning of the Reactor Safety Study published by the NRC in 1974, known as the Rasmussen report or WASH-1400, directed by Norman Rasmussen of the Massachusetts Institute of Technology.
- George Wald, a Nobel laureate in physiology and medicine and nuclear opponent, said that nuclear power plants could run safely, but at the risk of lessening profits. "The business of the power industry is not to make power but to make money. ... The industry has regularly cut corners to save money ... and from the very beginning, the American insurance companies have refused to insure nuclear plants, making the bulk of liability rest on the government. ... The money comes from taxpayers" (Klaus 1979).

Long-Term Goal:

- To ensure the protection of Americans from radiation and other negative aspects of nuclear power generation.
- To ensure that the NRC is doing an adequate and thorough job of maintaining safety at all U.S. nuclear power plants.

THE ACCIDENT: CHRONOLOGY, MARCH 28–30, 1979

The first 72 hours after the initial discovery of the radiation release were the most uncertain and the most urgent. Consequently, this case will focus only on the events from Wednesday, March 28 at 4 a.m. through Friday, March 30 at midnight. Other issues will be discussed in later cases.

Wednesday, March 28, 1979

04:00: Something began to go wrong at the nuclear power plant facility on Three Mile Island (TMI) near Harrisburg, Pa. That morning, the plant was operating at 97 percent power. The accident began in Unit 2 with a relatively minor mechanical malfunction. A small-break loss-of-coolant accident (LOCA) occurred when a valve failed to close. The indicator light in the control room showed that the signal had been sent to close the valve even though the valve remained open. Relying on this indicator light, the control room operators believed that the valve had closed. Meanwhile, they ignored other indications that the valve was actually open and that temperatures in the core were rising. The emergency core cooling system (ECCS) automatically came on, but the operators turned it off because they did not understand what was actually taking place. By doing this, they severely restricted the amount of water that was being injected into the core by the ECCS. As a result, a significant portion of the core was left uncovered for an extended period of time. If the operators had let the ECCS come on and perform the operation it was designed to do, the accident would have been a minor glitch in the life of the plant.[1]

04:45: George Kunder, the superintendent of technical support for the plant, arrived at TMI. Kunder later said that he was not expecting the situation he found when he entered the control room. Along with the four operators in the control room, Kunder tried to assess the events that were taking place.[2]

06:00: A conference call took place between representatives from Metropolitan Edison, the company that owned the Three Mile Island plant, and Babcock and Wilcox, the company that designed and built the reactor. They discussed what was happening and were still under the impression that the valve had closed. At the time, the core was slowly being uncovered. Since there was no radiation alarm, and no fuel pellets were rupturing, the men were unaware that the core was in serious danger.[3]

[1] *Report of the President's Commission on the Accident at Three Mile Island.* Washington, D.C.: U.S. Government Printing Office, 1979, 27, 28, 110, & 111.

[2] Ibid., at 119.

[3] Martin, Daniel. (1980) *Three Mile Island: Prologue or Epilogue.* Cambridge, MA: Ballinger Publishing Co., 57.

06:50: The operators in the control room realized that the radiation levels were abnormal. It was now time to take action by alerting authorities outside the plant of the problem. Under the established flow of communication in the case of a nuclear accident, the plant is required to notify Dauphin County and PEMA. Following the procedures for emergencies at the plant, William Zewe, a senior operator at TMI, called Dauphin County emergency management officials and told them there was a "site emergency."[4]

07:02: Zewe then called PEMA and informed the watch officer, Clarence Deller, that the reactor "has been shut down ... there is a high level of radiation within the reactor room ..."[5] Because Deller was not trained in the technical details of nuclear reactor operations, Zewe did not go into any more detail about what was happening at the plant.

07:04: PEMA in turn notifies the Bureau of Radiation Protection (BRP) within the Department of Environmental Resources (DER). The PEMA duty officer contacted the BRP and spoke with William Dornsife, the only nuclear engineer employed by the state of Pennsylvania.[6] PEMA also notified all counties within a five-mile radius of the plant (Lancaster, Dauphin, York) and other states and state agencies.[7]

07:04: The first phone call to the NRC was logged. Since the office was not open, the call was received by an answering service. The operator who received the call called the duty officer at home, but he was already on his way to the office. After being paged by the answering service, the duty officer waited until he got to the office to answer the page.[8]

07:08: PEMA contacted Dauphin County, and the county official verified that they had been contacted directly by the operators at TMI earlier.[9]

07:10: The U.S. Department of Energy (DOE) was notified of the situation. Metropolitan Edison contacted the Brookhaven National Laboratory of the DOE to notify them of the situation and the potential need for a Radiological Assistance Team (RAT). Although Metropolitan Edison did not request immediate assistance, the RAT team went on stand-by status.[10]

[4] Governor's Office. Press Conference Transcript. March 28, 1979, 11 a.m.

[5] Henderson, Oran. Memorandum to Governor Richard Thornburgh. "The Chronology of Alerting—Three Mile Island Incident," March 29, 1979.

[6] Gerusky, Thomas. Memorandum. "Department of Environmental Resources: Bureau of Radiation Protection Actions," undated, 1.

[7] Ibid.

[8] Martin, 74.

[9] Henderson, Oran. Memorandum to Governor Richard Thornburgh.

[10] Cantelon, Philip L. and Robert C. Williams. (1982) *Crisis Contained: The Department of Energy at Three Mile Island.* Carbondale, Illinois: Southern Illinois University Press, 167.

07:15: Gary Miller, the station manager and Metropolitan Edison's senior executive stationed at the facility, arrived at the plant to take charge of the control room. Miller testified later that what surprised him the most was that radiation monitors were now flashing at several stations in the plant and that the radiation was rapidly growing in intensity. Miller established and sent out teams, as was required by the plan in the event of a site emergency, to monitor radiation both on and off site.[11]

At the same time, Dornsife finally got in touch with the operators in the control room. He had tried to call as soon as he got the notification from PEMA, but the switchboard operator at the plant did not connect him with the control room. The control room operators got word that he had called, and called him back at **07:15**. The operators told Dornsife that a small-break LOCA had occurred, but that it was now contained. They also told him that a site emergency had been declared due to the increased levels of radiation in the control room. They assured him that no radiation had been detected outside of the building and that the plant was stable and in the process of being cooled. During this phone call, a loudspeaker in the control room sounded, announcing that due to radiation in the fuel-handling auxiliary building, the building was to be evacuated immediately. Dornsife was then connected with a representative from the health physics department who once again assured him that there were no off-site releases.[12] After learning the status of the plant, he immediately called Maggie Reilly at the BRP and asked her to establish the required open telephone line to the plant.[13]

07:24: Miller escalated the incident from a "site emergency" to a "general emergency." A general emergency is defined by Metropolitan Edison as an "incident which has the potential for serious radiological consequences to the health and safety of the general public."[14] After this change in status, the plant was evacuated.[15] At the same time this was occurring, Colonel Oran Henderson, the director of PEMA, first learned of the incident at the plant from one of his operation officers.[16]

07:30: The BRP learned from TMI that a general emergency had been declared. At this point, Tom Gerusky, the radiation protection director at the BRP, requested verification of on- and off-site radiation survey instrumentation.[17]

[11] Martin, 62.

[12] Ibid., 103.

[13] Gerusky, 1.

[14] *Report of the President's Commission on the Accident at Three Mile Island*, 122.

[15] Ibid.

[16] Henderson, Oran. Testimony to President's Commission on Three Mile Island. August 2, 1979, 35 & 36.

[17] Gerusky, 1.

07:36: TMI called PEMA to notify them of the general emergency status. The operators at the plant told PEMA that there had been another radiation release and warned that they should be ready to evacuate Brunner Island and the community of Goldsboro, both within close proximity of the plant.[18] A few minutes later, the DER verified the general emergency condition and recommended that PEMA initiate preparedness for emergency evacuations.[19]

07:40: The Nuclear Regulatory Commission (Region 1—King of Prussia) switchboard operator arrived at work a bit early (the office opened at 08:00) and received the message about the events that were occurring at the TMI plant. The operator immediately began calling the appropriate people within the organization to apprise them of the situation.[20]

07:40 and **07:50**: PEMA alerted York, Dauphin, and Lancaster County Emergency Management Offices; the Pennsylvania State Police; the Pennsylvania Department of Transportation; and the Departments of Public Welfare, Health, Agriculture, and Community Affairs to the risk.[21]

07:50: In Harrisburg, Governor Thornburgh, who had been the governor of Pennsylvania for less than three months, was called out of a meeting to answer a phone call from Henderson.[22] Thornburgh has recalled his thoughts after hearing the information from Henderson, "For just a moment, I tried to think where that was and then recognized or recalled from a briefing I'd had that it was about 10 miles down the Susquehanna River from the capitol. While I didn't know any of the particulars, I knew immediately that any kind of an accident at a facility like that was something that really was [going to be] a serious consideration for us."[23] The information given to Governor Thornburgh at the time was brief and undetailed. After the phone call, he headed back to his breakfast meeting and made no mention of the accident to the people in attendance.[24]

08:00: The containment building at the plant was isolated. The pipes going between the buildings were shut off. When the operators opened them, some radioactivity leaked into the atmosphere.[25]

08:10: At the NRC Region 1 Office in King of Prussia, Pa., Charles Gallina, an investigator with the NRC, was designated to organize the Inspection and Enforcement Team. Gallina made sure that telephone lines were established with both the plant and the NRC national management center in Bethesda, Md.[26]

[18] Henderson, Oran. Testimony to President's Commission on Three Mile Island. August 2, 1979, 36.

[19] Henderson, Oran. Memorandum to Governor Richard Thornburgh.

[20] Martin, 74 & 75.

[21] Henderson, Oran. Memorandum to Governor Richard Thornburgh.

[22] Ibid.

[23] Gazit, Chana. 1999. The American Experience: The Meltdown at Three Mile Island. Produced and written by Chana Gazit. 60 min. PBS Home Video. Videocassette.

[24] Ibid.

[25] *Report of the President's Commission on the Accident at Three Mile Island*, 122 & 123.

[26] Martin, 75.

08:13: Governor Thornburgh left his breakfast meeting and called his press secretary and director of communications, Paul Critchlow. Thornburgh "knew that any kind of incident at a nuclear facility was bound to provoke some press inquiry once it became known."[27] After Critchlow reported everything he knew about the situation, Thornburgh asked him to gather as much information as he could about the incident. Once again, Thornburgh headed back to his meeting.[28]

08:20: Henderson contacted the lieutenant governor, Scranton, to notify him of the incident.[29] The lieutenant governor was the appointed chair of the Governor's Energy Council, an organization created by executive order of Thornburgh, as well as the head of the State Emergency Council.[30] He was to serve as the liaison between the governor and PEMA when state emergencies occurred.[31] The combination of these two roles cast Scranton into a prominent position in the incident at TMI.

08:25: Reporters first became aware of the situation. A traffic reporter for WKBO, a local radio station, sensed trouble at the plant when he overheard conversations on his CB radio regarding the mobilization of fire and police departments in Middletown. He called the station news director, Mike Pintek, to alert him to the situation. Pintek immediately called the plant and was connected to the control room at TMI. The operator who answered the call said, "I can't talk now, we have a problem," and told Pintek to call Metropolitan Edison's headquarters in Reading, Pa.[32] Pintek spoke with Blaine Fabian, Metropolitan Edison's manager of communication services, who told him that, "There was a problem with a feedwater pump. The plant is shut down. We're working on it. There's no danger off site. No danger to the general public."[33]

08:30: PEMA notified Cumberland County's emergency preparedness office of the accident. Cumberland County was not within the five-mile radius of the plant, but was just on the border of the 10-mile radius.[34]

08:44: The mayor of Middletown, Robert Reid, was notified of the incident by his civil defense director. Middletown is a small community located only a few miles from Three Mile Island. Mayor Reid, a high school teacher who was paid $150 a month for his job as the mayor, claimed the only information he received about the situation was from the television and the radio and complained that this information was "confusing and contradictory".[35]

[27] Thornburgh, Richard L. Deposition for the President's Commission on the Accident at Three Mile Island. Harrisburg, Pa., 5 & 6.

[28] Ibid.

[29] Henderson, Oran. Memorandum to Governor Richard Thornburgh.

[30] Department of General Services. (1979) The Pennsylvania Manual (1978–1979). Volume 104. Harrisburg: Department of General Services, Commonwealth of Pennsylvania, 363.

[31] Martin, 105.

[32] *Report of the President's Commission on the Accident at Three Mile Island*, 123.

[33] Ibid., at 124.

[34] Staff Writer. "Call for Investigation: Area Officials Concerned Over 'Proper' Notification," *The Patriot*, 29 March 1979.

[35] Reid, Robert. Testimony for The Select Committee's Report of the hearing concerning Three Mile Island. June 8, 1979, 21.

08:45: In King of Prussia, Gallina finished gathering the NRC site team that would soon depart for TMI. The team consisted of Gallina; James Higgins, a reactor inspector; and three health inspectors.[36] At the NRC office in Bethesda, staff members were preparing their emergency center for operations.

After a group of people from the appropriate offices within the NRC gathered, the NRC emergency center in Bethesda was operational by **08:50**.[37]

Sometime between **08:00** and **09:00**, Gordon MacLeod, Pennsylvania's secretary of health, was notified of the events unfolding at TMI. MacLeod, who had held his office for a total of 12 days, was in the Pittsburgh office at the time. In a later testimony, he recalled this notification call; "I asked the person who called me, the director of health communications, to put me in touch with the person who was in charge of radiation health within the health department. He advised me that we did not have a Division of Radiation Health. ... Well, I asked him where was radiation health, and he said that it was in the Department of Environmental Resources. I then asked him if he would put me in touch with the person who was our liaison person, and I found out that in fact, we have no liaison with that department. I then asked him to collect for me the library references and journals that would inform me about radiation health and found out that we did not have a library. It had been dismantled about two years ago for budgetary reasons."[38]

09:05: Governor Thornburgh contacted the lieutenant governor and requested a report about the incident at TMI.[39] Thornburgh later acknowledged that he "had really put the major burden of fact-finding and briefing for me on his [Scranton's] shoulders, and so his contacts with DER ... were, in effect, my contacts because they formed the basis of any briefing that he gave me."[40] Thornburgh thought it was important he continue to conduct business as usual in the capitol since there were many other pressing issues that needed his attention.[41]

09:06: The Associated Press released the first news story about TMI. The article quoted the Pennsylvania State Police as saying that a general emergency had been declared. The article also stated that there was no radiation leak and that a helicopter requested by Metropolitan Edison officials would be carrying a monitoring team to measure the levels of radiation in the atmosphere.[42]

[36] Martin, 75.

[37] Ibid.

[38] MacLeod, Gordon. Testimony to President's Commission on the Accident at Three Mile Island. August 2, 1979, 133 & 134.

[39] Governor's Office. Chronology of the T.M.I. Incident: March 28, 1979–April 1, 1979. (Draft prepared in preparation for the President's Commission testimonies.), 2.

[40] Thornburgh, Richard L. Deposition for the President's Commission on the Accident at Three Mile Island. Harrisburg, Pa., 13.

[41] Ibid.

[42] *Report of the President's Commission on the Accident at Three Mile Island*, 124.

09:15: The NRC contacted the White House to notify them of the events that were taking place near the capital of Pennsylvania.[43] Victor Gilinsky, one of the five commissioners of the NRC, called Jessica Tuchman Mathews, a White House staff member, with whom he was acquainted. After speaking with Gilinsky, Mathews wrote a memo about the situation at the TMI plant and delivered it to her boss, Zbigniew Brzezinski. Brzezinski then delivered the memo to President Jimmy Carter.[44]

09:30: John (Jack) Herbein, the vice president of generation for Metropolitan Edison was getting ready to leave Philadelphia and head for the TMI plant. President of Metropolitan Edison, Walter Creitz, issued the directive for Herbein to go the plant. Once he arrived, his main responsibility would be to manage the press relations.[45] There were, in fact, dozens (soon to be hundreds) of reporters already gathered near the plant waiting to obtain information about the situation happening inside the enormous, ominous structures located on the island.

09:37: After much investigation and information gathering, Scranton called Thornburgh to brief him on the situation. Scranton reported that there had been some release of radiation into the environment. He also stressed the importance of informing the public about the situation. Scranton recognized the unique fear that the threat of radiation can cause because of its unknown consequences.[46]

10:00: The first officials arrived from the NRC.[47] James Higgins was responsible for discussing reactor problems, and Gallina was responsible for discussing problems with radiation. They each had an open phone line to the NRC Region 1 office.[48]

10:55: State officials prepared to give the first press conference of the day. Lieutenant Governor Scranton, Dornsife, Henderson, as well as some other state officials met with reporters. Scranton gave an opening statement and quoted Metropolitan Edison as saying "there is and was no danger to public health and safety." He told the press corps that there was a small amount of radiation released into the atmosphere. He also reported that all safety equipment functioned properly, that a helicopter was currently monitoring the air around the plant and the near vicinity, and that there was no need for evacuation.[49]

[43] Ibid.

[44] Martin, 157.

[45] *Report of the President's Commission on the Accident at Three Mile Island*, 124.

[46] Governor's Office. Chronology of the T.M.I. Incident: March 28, 1979–April 1, 1979, 2.

[47] *Report of the President's Commission on the Accident at Three Mile Island*, 124.

[48] Martin, 84 & 85.

[49] Governor's Office. Press Conference Transcript. March 28, 1979, 11 a.m., Part II–3a.

11:00: All nonessential people were ordered to leave the island.[50] The BRP also requested a team from the Brookhaven National Laboratory of the United States DOE to monitor the radiation levels in the area.[51] The DOE had been offering their assistance throughout the morning, so they were prepared to come when asked.[52] The DOE began its first helicopter flight to monitor radiation levels at **13:45**.[53]

11:00: Mayor Reid finally got through to TMI and was told to call Metropolitan Edison's headquarters in Reading. Pa. After hours of calling and trying to get more information, Reid finally received a phone call from the company assuring him "that no radioactive particles had been released and there were no injuries." He testified that he heard a news report 20 seconds later that stated radioactive particles had been released.[54]

11:30: Governor Thornburgh called a meeting in his office to review what had happened at the press conference. According to the governor's later deposition for the President's Commission, his understanding of the situation to this point was "that there had been a venting to the environment of radiation; that at that time there was not perceived to be any substantial off-site threat or any concern; that they did not have the thing under control; that they were still trying to find out precisely what happened; and that our people were in contact with the utility people at the site, and that for the moment, there was no need for us to take any ... action insofar as evacuation was concerned."[55]

13:00: Metropolitan Edison held its first press conference. John Herbein answered questions from reporters outside the observation deck of the plant. During the question-and-answer session Herbein said, "I would not call it at this point a very serious accident." He also reported that no significant levels of radiation were released, that the reactor was being cooled in accordance with design, and that there was no danger of a meltdown.[56] The word "meltdown" was one with which people had recently become more familiar. Coincidentally, only a few weeks before the incident at TMI, a movie dramatizing a fictional accident at a nuclear power plant facility had been released. The popular movie, *China Syndrome*, starred Jack Lemmon, Jane Fonda, and Michael Douglas. The term "China Syndrome" was used in the nuclear industry to describe the phenomenon of a core meltdown. Although, of course this could not happen, the term was used to describe how the melted fuel was so hot that it would burn a hole through the earth all the way to China.

[50] *The President's Commission on the Accident at Three Mile Island*, 124.

[51] Ibid.

[52] Ibid.

[53] Ibid.

[54] Reid, Robert. Testimony for The Select Committee's Report of the hearing concerning Three Mile Island. June 8, 1979, 21.

[55] Thornburgh, Richard L. Deposition for the President's Commission on the Accident at Three Mile Island. Harrisburg, Pa., 11 & 12.

[56] Metropolitan Edison. 1979. Video Recording of 1 p.m. Press Conference, dated March 28, 1979. Filmed and produced by WQED. Videocassette.

14:30: Metropolitan Edison personnel had its first meeting with state officials. Paul Critchlow requested that a lawyer from the Department of Justice be present. Gerusky, director of radiation protection at the BRP, reported that a release of radioactive material occurred between **11:00** and **13:30** and stated that the company had not provided appropriate notification of this event. Herbein claimed that it was normal ventilation and that, in fact, there would probably have to be more controlled releases of steam. When asked why he had not mentioned the release in his earlier press conference, Herbein replied, "It didn't come up." During this meeting, Herbein also admitted that there was possible fuel damage at the plant.[57]

16:30: Lieutenant Governor Scranton held his second press conference of the day. He stated that the "incident is more complex than Metropolitan Edison led us to believe." He informed the press that more tests were being taken and that the governor's office and experts on the scene remained convinced that there was no danger to public health. Scranton reported that the company had given out conflicting information. He stated that there had been a release of radioactive material, but there was no evidence that it was at a dangerous level. He also reported that steam was discharged earlier in the day during normal venting procedures, but due to the leak, radioactive material was also released. DER was not notified until after the release had taken place, but Scranton assured the press that Metropolitan Edison would be notifying the DER of any future ventilating releases. During the question-and-answer session, Scranton admitted his disappointment with the company for not revealing the information about the venting procedures.[58]

20:45: Gallina, Higgins, Critchlow, and Gerusky met in Scranton's office along with Bob Freiss from the emergency response team of the DOE and Jay Waldman, Thornburgh's executive assistant. Gallina stated at the meeting: "Future emissions, if any, will be less than today's venting from the auxiliary building." He also mentioned possible core exposure.[59] One of the problems the attendees confronted was the difficulty of communicating and understanding the technical language used to describe the events happening at the plant.[60] By the end of the meeting, they had established that there was a slight chance of a meltdown, but if that were to occur, they would have plenty of time to order and carry out an evacuation.[61] Shortly after the meeting, Scranton called Thornburgh to brief him on what had occurred, and they arranged to meet later that evening.[62]

22:00: Scranton held his third and final press conference of the day. Scranton informed the press that there was currently no radioactive leakage from the primary building or the reactor itself. He stated that the auxiliary building did contain radioactive material, which was being vented. As a result of the ventilation, some radiation was escaping into the atmosphere, but the levels were not dangerous. The NRC officials reported that there had been no human error detected at this point and that the reactor was in a safe condition. They assured the reporters that the operations at the plant were being monitored by the NRC, that no mechanical damage had been detected, that there was no problem with containment, that there was no significant core damage, and that Metropolitan Edison acted responsibly throughout the day.[63]

23:00: Thornburgh called a meeting of state and NRC officials at the governor's mansion.[64] This meeting was the first full briefing that Governor Thornburgh had received. NRC and DER representatives gave Thornburgh a thorough account of what had happened at the plant throughout the day. They also attempted to predict what they could expect to happen in the coming hours and days. During this meeting, the potential for core meltdown was not discussed.[65] After the meeting ended, Thornburgh walked out to speak with antinuclear demonstrators who were standing outside of the front gate of the mansion. They were holding candles and chanting, "Help us please."[66]

That night, Walter Cronkite opened his CBS nightly newscast with the words, "It was the first step in a nuclear nightmare as far as we know at this hour, no worse that that. But a government official said that a breakdown in an atomic power plant in Pennsylvania today is probably the worst nuclear accident to date. ..."[67]

[57] Governor's Office. Chronology of the T.M.I. Incident: March 28, 1979–April 1, 1979, 3.

[58] Governor's Office. Press Conference Transcript. March 28, 1979, 4:30 p.m., Part I–4 & 5.

[59] Governor's Office. Chronology of the T.M.I. Incident: March 28, 1979–April 1, 1979, 4.

[60] Martin, 110.

[61] Governor's Office. Chronology of the T.M.I. Incident: March 28, 1979–April 1, 1979, 5.

[62] Ibid., at 6.

[63] Governor's Office. Press Conference Transcript. March 28, 1979, 10:30 p.m.

[64] Governor's Office. Chronology of the T.M.I. Incident: March 28, 1979–April 1, 1979, 5.

[65] Thornburgh, Richard L. Deposition for the President's Commission on the Accident at Three Mile Island. Harrisburg, Pa., 22 & 23.

[66] Gailey, Phil. 1979. Pennsylvania Governor's Problem Was Simply Finding Facts. *The Washington Star.* 4 April.

[67] Thornburgh, Dick. (2003) Draft Copy of *Where the Evidence Leads: An Autobiography.* Pittsburgh, PA: University of Pittsburgh Press. Located at the Dick Thornburgh Archives, University of Pittsburgh, Pittsburgh.

Thursday, March 29, 1979

Thursday, March 29, 1979, began with a number of talk show appearances by many of the key players in the situation, offering differing perspectives on the continued operation of the plant. *The Today Show* with Tom Brokaw featured interviews with Walter Creitz, Richard Pollack from the Ralph Nader Critical Mass Energy Project, Daniel Ford from the Union of Concerned Scientists, and Senator Gary Hart, chair of the Senate Subcommittee on Nuclear Regulations. The *Today* correspondent announced at the beginning of the program that the DOE and the NRC had been aware of problems, including a problem with a safety valve, at the TMI plant as early as one month before the accident. Pollack said he was amazed that the plant was still in operation after being shut down for five out of the last 12 months due to safety-related problems. Brokaw reported that the NRC had said that radiation penetrated through four-foot thick walls and had spread as far as 10 to 16 miles from the plant. When Creitz was interviewed, he assured the viewers that there was no human error involved in the incident at the plant. During the debate between Ford and Creitz about the safety of the plant, Ford cited an NRC report (completed before the accident) on safety problems at TMI. When Senator Hart was interviewed, he reported that there was, in fact, human error involved in the situation at TMI. He also supported the fact that the plant had been shut down four times already for safety reasons. During the same interview, Hart also stated that he did not believe the events at TMI would affect the future of nuclear energy in the United States.[68]

Later that morning, Creitz and Ford were also on *Good Morning America*, once again debating the safety of nuclear power plants. This time, Ford pointed to five other plants in the United States that had recently been shut down due to safety problems. Ford said, "The fact of the matter is that the regulatory program has been exceedingly lax, that they have been so interested in seeing a large nuclear power program that they have compromised the safety of the reactors in the interest of promoting the commercial prospects of the industry. That's the problem." Creitz responded, "I think the record of the industry having 72 reactors in operation and never injuring any member of the public certainly speaks highly of the ... safety precautions that are followed in the nuclear industry."[69]

[68] National Broadcasting Company. *The Today Show*, March 29, 1979. Produced and written by WNBC-TV & NBC Television Network: New York. Transcript.

[69] American Broadcasting Company. *Good Morning America*, March 29, 1979. Produced and written by WABC-TV & ABC Television Network: New York. Transcript, 5.

10:00: Metropolitan Edison held another press conference with both Herbein and Creitz present. Herbein stated that the situation was secure, cooling was in progress, and that there was no immediate danger to the general public. He anticipated that the reactor would be stabilized sometime later that day. Herbein said, "There is presently no danger to the public health or safety. We didn't injure anybody, we didn't over-expose anybody, and we certainly didn't kill anybody." Mayor Reid was at the press conference and confronted Herbein about the difficulty of getting any kind of concrete information from the company during the first hours of the incident.[70]

12:00: The lieutenant governor released a press statement giving an update on the situation at TMI. He stated that off-site radiation was monitored overnight and that the readings were all within normal safety ranges. The statement also said, "The Company, the NRC, the U.S. DOE, and the Pennsylvania DER have advised us that everything is under control. There is no need to consider evacuation at this time."[71]

12:45: Scranton went to TMI and toured the facility. When he asked Metropolitan Edison about coming to visit the plant to see what was happening for himself, Creitz was hesitant. Scranton insisted, and Creitz finally agreed. Creitz also pointed out that Senators Hart and Heinz would be at the plant around noon, and it would be convenient if they all toured the plant together. Scranton refused this offer because he had very specific questions to ask and details he wanted to know. He did not want his experience to be limited by the senators' time schedules or agendas.[72]

Sometime that afternoon, Anthony Robbins, the director of the National Institute for Occupational Safety and Health (NIOSH), made a phone call to Gordon MacLeod. MacLeod claims that during this phone call Robbins urged him to consider evacuation of the area around TMI. MacLeod informed Robbins that evacuation was not in order at the present time because the radiation levels were low. Robbins was more concerned with the inability to bring the reactors to a cold shutdown than he was about radiation levels. Robbins also said he was speaking both from the standpoint of the NIOSH and the Bureau of Radiological Health within the Food and Drug Administration (FDA).[73] There has been some controversy surrounding the actual content of this conversation. Robbins denies

[70] Metropolitan Edison. 1979. Video Recording of 10 a.m. Press Conference, dated March 29, 1979. Filmed and produced by WQED. Videocassette.

[71] Scranton, William. Press release, March 29, 1979.

[72] Scranton, William. Handwritten notes from Three Mile Island plant tour. March 29, 1979.

[73] MacLeod, Gordon. Testimony to President's Commission on the Accident at Three Mile Island. August, 2 1979, 137–140.

that he called to urge evacuation, claiming that he called MacLeod to offer support and assistance.[74] Following this phone call, MacLeod set up a conference call between Henderson, Gerusky, and one of Thornburgh's staff members. He shared the details of his phone call with Robbins, and they all agreed that evacuation was not necessary at the present time. MacLeod did suggest that they consider advising pregnant women and children under the age of two to leave the area since they constitute the population most susceptible to the harmful effects of radiation. The group agreed not to take any action at this time.[75]

Mobilization for Survival, a coalition of 250 people against nuclear technology, also called a press conference for that afternoon. George Wald, professor emeritus of biology at Harvard University and winner of the 1967 Nobel Prize for physiology and medicine, and Ernest Sternglass, director of radiological physics at the University of Pittsburgh, both spoke at the gathering. Wald said, "Every dose of radiation is an overdose. ... A little radiation does a little harm and more radiation does more harm." He also criticized the nuclear industry for prioritizing profit-making over safety and said, "The business of the power industry is not to make power but to make money. ... The industry has regularly cut corners to save money ... and from the very beginning, the American insurance companies have refused to insure nuclear plants, making the bulk of liability rest on the government."[76] Sternglass argued that the plants should be shut down. He expressed his belief that more money should be spent on alternative energy sources such as clean oil and gas facilities. Sternglass had a portable radiation monitor with him and claimed that three miles away from the plant, the reading was nine times higher than normal and that within a one mile radius of the plant, the levels of radiation were 14 to 15 times higher than normal. Both men also warned of the latent cancers and ailments that could "creep up" on people and occur as many as 30 years after exposure.[77]

22:00: Higgins called Critchlow and reported that the NRC's assessment of the problem had changed. They had discovered serious fuel damage, and the recovery time could be very lengthy. There was a strong possibility of more emissions being released from the plant.[78]

[74] Martin, 123 & 124.

[75] MacLeod, Gordon. Testimony to President's Commission on the Accident at Three Mile Island. August, 2 1979, 137–140.

[76] Mobilization for Survival. Press Conference, dated March 29, 1979. Filmed and produced by WQED. Videocassette.

[77] Klaus, Mary. 1979. Radiation Above Normal: Scientists Seek Closing. *The Patriot.* 30 March.

[78] *The President's Commission on the Accident at Three Mile Island*, 135.

22:20: Governor Thornburgh held a press conference and assured the press that there was no reason for alarm or need to disrupt daily routines and no reason to believe that public health had been affected. He said that he had spent "the last 36 hours trying to separate fact from fiction." He empathized with the reporters for receiving conflicting information and let them know he had received that same confusing information. Thornburgh shared his belief that things were now under control. Scranton described his experience touring the plant, said that he had been exposed to 80 millirems of radiation, and that he felt fine. During the questioning by the press corps, Higgins said the plant "is now approaching the cold shut-down region." Gallina said, "A preliminary evaluation indicated no operator error." He also stated that the danger was now over for people off site.[79] Thornburgh later reported that he was uncomfortable with this last statement. He thought it was too soon to be issuing these kinds of assurances to the public.[80]

James Schlesinger, the secretary of the DOE, was quoted sometime on Thursday as saying the DOE would be investigating the accident at TMI. He also stated that the nuclear power industry had a good safety record and emphasized the importance of nuclear power for the U.S. economy.[81] Without nuclear energy, he stated, the United States would be forced to increase dependence on foreign oil and potentially suffer from energy shortages.[82]

Senator Edward Kennedy, the chair of the Subcommittee on Energy, was quoted in the newspaper on Thursday urging Schlesinger to reconsider submitting a bill designed to expedite the licensing process for nuclear power plants.[83] Kennedy made reference to safety issues, saying "the shutdown of five reactors two weeks ago for safety reasons and the accident yesterday ... show that the nuclear safety licensing process is not working." He stressed the importance of building the plants safely rather than trying to build them quickly.[84]

Other newspaper articles from Thursday cited interviews with mayors of the various towns surrounding the Three Mile Island plant. Charles Erisman, the mayor of Royalton, a small community within Dauphin County, complained that he did not hear any information about the incident until after **11:00** on Wednesday. Because the mayor is responsible for coordinating the civil defense efforts, he was frustrated with this lack of information. Kevin Molloy, director of the Dauphin

[79] Governor's Office. Press Conference Transcript. March 29, 1979, 10:20 p.m.

[80] Thornburgh, Dick. (2003) Draft Copy of *Where the Evidence Leads: An Autobiography.* Pittsburgh, PA: University of Pittsburgh Press. Located at the Dick Thornburgh Archives, University of Pittsburgh, Pittsburgh.

[81] Staff Writer. 1979. He Favors N-Power Despite Accident. *The Patriot.* 29 March.

[82] Ibid.

[83] Washington Bureau. 1979. Schlesinger Is Cautioned. *The Patriot.* 30 March.

[84] Ibid.

County Office of Emergency Preparedness, thought that Middletown had told Royalton about the situation. Another small community called Highspire did not get any official communication about the accident until after 21:30 on Wednesday.[85] Kenneth Myers, the mayor of Goldsboro, another nearby community, said he "wasn't notified of the accident, and [didn't] know how many other municipal officials were."[86]

Friday, March 30, 1979

Again, the day opened with various appearances on television and radio programs by the governor and nuclear opponents Wald and Sternglass.

07:00: Thornburgh appeared on a local CBS station on Friday morning. Before the interview began, a reporter, Bob Schieffer, gave an explanation and update of the situation at TMI. He talked about the element of human error; "For some reason not yet explained, a control room operator cut off the emergency water supply."[87] Schieffer also said, "Some health officials are arguing it could be 30 or 40 years when cancer rates are finally evaluated before the effects of the accident are really known."[88] The reporter interviewing Thornburgh, Gary Shepard, reported that 400,000 gallons of radioactive water had been dumped into the river, that officials had said that the xenon would dissipate within hours, and that it posed no danger to public health. Thornburgh confirmed that statement, stating that the water contained only trace elements of radiation. He went on to explain the necessity of discharging the water to avoid more serious problems in the future. Sternglass and Wald both commented on the extreme dangers of radiation: "There is no threshold, any bit is harmful."[89]

Sometime Friday morning, MacLeod asked Thornburgh to strongly consider evacuating pregnant women and young children from the area. MacLeod, a physician, was aware that radiation has a much more significant impact on fetuses and developing children than it does on adults. He urged Thornburgh to take all necessary health precautions.[90]

10:30: President Jimmy Carter called Hendrie to determine whether the NRC needed assistance. Hendrie told him that the communications were "a mess." Carter asked for a recommendation of someone who could be sent to TMI to speak for the government. Hendrie replied that Harold Denton was the appropriate person and that Denton was preparing to leave for Pennsylvania.[91]

[85] Harwood, Jon. 1979. Royalton Never Got the Word. *The Patriot.* 29 March.

[86] Quigley, Roger. 1979. Goldsboro: Tranquility and Anger. *The Patriot.* 29 March.

[87] Columbia Broadcasting System. *CBS Morning News*, March 30, 1979. Produced and written by WCBS and the CBS Television Network. Transcript, 1.

[88] Ibid.

[89] Ibid., at 4.

[90] MacLeod, Gordon. Testimony to President's Commission on the Accident at Three Mile Island. August, 2 1979, 143.

[91] Martin, 148.

11:00: Metropolitan Edison held another press conference. Herbein stated that the earlier release had been measured at around 300–350 millirems/hour by an aircraft flying over the plant. The press corps had heard the report of 1,200 millirems/hour earlier in the day, but Herbein admitted he had not heard that figure. Reporters asked many questions about the validity of the numbers and whether the release was controlled or uncontrolled. They also asked about public safety and the previous release of the wastewater from the plant. Herbein was visibly frustrated with the situation and finally responded to a question by saying, "I don't know why we have to tell you each and every thing we do!" This remark upset reporters who then questioned the responsibility of the plant managers' actions to inform the public.[92]

11:15: President Carter called Governor Thornburgh. Carter had attempted to call earlier, but could not get through due to busy phone lines. Thornburgh asked for an expert to be sent to help with the technical issues. Carter assured him that Harold Denton was on the way for that very purpose. Carter also promised to establish a special communications system that would link the plant, the governor's office, the White House, and the NRC.[93]

14:00: Harold Denton arrived in Harrisburg with a team of experts and immediately began to assess the situation.[94]

15:15: Denton called Hendrie in Washington to share the technical information about the plant. Denton concurred with the earlier decision that evacuation was not necessary at the present time.[95] About 30 minutes later, Hendrie called Thornburgh and told him that the NRC and Metropolitan Edison agreed that the core damage was serious. He confirmed that the bubble was, in fact, present, but that it was stable and had only a small chance of exploding. Hendrie told Thornburgh there was a one percent chance of a meltdown occurring, but a five percent chance of large unplanned releases of potentially radioactive gases from the plant.[96]

16:00: A United Press International wire story quoting an NRC staff member reported that there was a possibility of a core meltdown within a few days.[97] Although Denton was to be the spokesperson for the NRC, two other NRC staff members had addressed the press regarding technical issues and mentioned that the worst-case scenario was a meltdown.[98]

[92] Metropolitan Edison. 1979. Video Recording of 1 p.m. Press Conference, dated March 30, 1979. Filmed and produced by WQED. Videocassette.

[93] *The President's Commission on the Accident at Three Mile Island*, 145.

94 Martin, 165.

[95] Ibid.

[96] Governor's Office. Chronology of the T.M.I. Incident: March 28, 1979–April 1, 1979, 15.

[97] Starr, Philip and William Pearman (1983). *Three Mile Island Sourcebook: Annotations of a disaster.* New York, New York: Garland Publishers.

[98] Martin, 166.

20:30: Denton briefed Governor Thornburgh in person for the first time. Denton told Thornburgh that there was extensive fuel damage and that the bubble posed a problem in cooling the core. They discussed meltdown as a worst-case scenario, and Denton recommended that, although evacuation was not necessary at the time, a 20-mile evacuation plan be ready.[99] In addition, Denton admitted that Metropolitan Edison was "thin on technical proficiency," so they would be bringing more experts in to help solve the bubble dilemma.[100]

22:00: Thornburgh and Denton gave their first joint press conference. Thornburgh stated: 1) "no evacuation order is necessary at this time," 2) "my earlier recommendation that pregnant women and preschool children stay out of the area within five miles of the plant site will remain in effect until at least sometime tomorrow, when we expect to provide you with further advice," and 3) "earlier advice that people living within 10 miles of the plant site try to remain indoors will expire at midnight."[101] Denton gave a quick summary of the plant's status and then fielded questions. During the question-and-answer period, he said that responsible officials were making sure that the system was being cooled down properly, that there was no danger to the public, that there had been extensive damage, that there was a gas bubble present that needed to be monitored, that there was no risk of explosion in the reactor vessel, and that the chance of a meltdown was extremely remote. He spent some time describing what would happen in the case of a meltdown including latent cancers and land contamination. Denton also admitted that there had been a severe communications problem getting information back to Washington, which was one of the reasons why conflicting information had been dispersed. He told the press about the new phone lines that had been established to keep open lines of communication to the White House and the NRC. Denton also informed the press that the NRC would make the final decision regarding options for bringing the reactor to cold shutdown and for dealing with the bubble.[102]

Friday also marked the day that the nuclear industry became more involved in the situation. Herman Dieckamp, the president of General Public Utilities (the parent company of Metropolitan Edison), organized a team of experts from all over the country to assist in the management of the situation. The first members of the Industry Advisory Group began arriving in Harrisburg the next day.[103]

[99] *The President's Commission on the Accident at Three Mile Island*, 144.

[100] Governor's Office. Chronology of the T.M.I. Incident: March 28, 1979–April 1, 1979, 16, 17 & 18.

[101] Governor's Office. Press Conference Transcript. March 30, 1979, 10 p.m.

[102] Ibid.

[103] *The President's Commission on the Accident at Three Mile Island*, 143.

The governor received a letter on Friday from the chair of the Public Utility Commission (PUC), Wilson Goode. The PUC is the regulating agency that had legal responsibility for the safety aspects of power generating stations. The letter from Goode politely requested that the PUC be notified of future briefings and press conferences regarding TMI. Since they were involved in the process of gaining access to alternative energy sources if necessary, they needed to know what was happening. Goode wrote, "Up to now we have tried as best we could to monitor the story as it has evolved from the news media and other sources. As you realize, much of this information has been fragmentary, contradictory and unnecessarily inflammatory. In turn, we are constantly contacted by the media for clarifying technical information and by a concerned public. They expect us to be abreast of events."[104]

Again, Walter Cronkite opened his nightly CBS news report with information about the situation in Pennsylvania. He said, "We are faced with the remote, but very real, possibility of a nuclear meltdown at the Three Mile Island atomic power plant."[105]

[104] Goode, Wilson. Letter to Governor Richard Thornburgh, March 30, 1979.

[105] Thornburgh, Dick. (2003) Draft Copy of *Where the Evidence Leads: An Autobiography.* Pittsburgh, PA: University of Pittsburgh Press. Located at the Dick Thornburgh Archives, University of Pittsburgh, Pittsburgh.

DISCUSSION: QUESTIONS FOR FURTHER INQUIRY

Reviewing the events of these three critical days in late March 1979, please return to the questions posed on page 5.

1. What is the "core information" that was vital to determine a responsible strategy of action in the first 72 hours after the failure of the coolant valve in Reactor #2 to close?
2. What were the "core nodes" through which this information flowed during the first 72 hours after this failure was discovered?
3. What were the gaps in the information flow that inhibited action? What were the bridges that facilitated information flow and action?
4. What were the methods that were used to distinguish "core information" from distracting events?
5. What is the most efficient process through which information could flow, given a similar event in a future time and place?

Please develop a strategy for action that would maximize cooperation among the five key actors identified in this case and minimize the potential disruption and loss to the population of central Pennsylvania. Please develop a rationale for your strategy that you would be prepared to defend before a similar group of decision-makers. In your judgment, is it possible to identify a "small world" network of decision-makers involved in this case that could communicate effectively with the wider group of individuals, organizations, and agencies affected by this set of events? If so, how and why? If not, why not? Please summarize your analysis in a memorandum that you would submit to the governor of Pennsylvania. If you wish, please create a map of the network of actors that you perceive as critical to this decision process, and illustrate the direction and strength of the information flow among them.

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