

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
Metropolitan Edison Company, et. al.) Docket No. 50-289
(Three Mile Island, Unit 1))

TESTIMONY OF RICHARD R. KEIMIG, NRC STAFF,
RELATIVE TO MANAGEMENT CAPABILITY
TO OPERATE A NUCLEAR GENERATING STATION

(ANGRY Contention 4)

Q.1 Please state your name and position with the NRC.

A. My name is Richard R. Keimig. I am a Section Chief in the Reactor Operations and Nuclear Support Branch, Office of Inspection and Enforcement, Region I.

Q.2 Have you prepared a statement of professional qualifications?

A. Yes. A copy is attached to this testimony.

Q.3 Please state your current and prior responsibilities with respect to the Three Mile Island Nuclear Station, Unit 1.

A. I am currently serving as the Region I coordinator for the Office of Inspection and Enforcement (IE) activities related to TMI-1. These activities include this proceeding concerning the restart of TMI-1, review of the IE/TMI-1 inspection program implementation and conduct of inspections,

liaison with the NRC/TMI Program Office, Resident Inspector Office and Office of Nuclear Reactor Regulation, and review of licensee submittals concerning TMI-1.

I am also Chief, Reactor Projects Section No. 1, in the Reactor Operations and Nuclear Support Branch, Region I. At the time of the TMI-2 accident, this section was responsible for project overview and implementation of the IE inspection program for TMI-1 and 2. (Information concerning the IE inspection program can be found in Appendix D to NUREG-0680, Supp. No. 1, dated November 28, 1980.) Inspection program implementation was assigned to the NRC Resident Office at TMI in early 1980 and is presently being carried out by personnel stationed on site under the direction of the Region I office.

Q.4 What is the purpose of your testimony?

A. The purpose of this testimony is to discuss ANGRY Contention 4 which states:

"The licensee lacks the management capability to operate a Nuclear Generating Station without endangering the public health and safety. This fact is conclusively demonstrated by the numerous negligent and imprudent actions committed by the licensee before and during the TMI-2 accident which are enumerated in Appendices IB and IIF of NUREG 0600. In support of its contentions, ANGRY places particular emphasis on the following:

- (a) Loss of an entire safety system, i.e., auxiliary feedwater generator.
- (b) Failure over an extensive period of time to correct leakage of reactor primary coolant through the pressurizer relief valve, causing excessive temperatures in the relief valve exhaust to be regarded as

a normal operating condition, and thus preventing such temperatures from alerting plant operators as they normally would to the stuck-open position of the PORV valve during the accident.

- (c) Throttling of high-pressure injection flow from the Emergency Core Cooling system in total disregard of abnormally low reactor coolant system pressure, and in apparent conformance to an "operating philosophy" concerning actuation of reactor HPI which placed greater emphasis on considerations of convenience and avoidance of down time than on safety."

Q.5 Would you briefly discuss Appendices IB and IIF of NUREG 0600 as they relate to this contention?

- A. ANGRY has based its contention on apparent negligent and imprudent actions which are enumerated in Appendices IB and IIF of NUREG 0600 which documents the NRC Office of Inspection and Enforcement's investigation of the accident at TMI-2 (Inspection Report No. 50-320/79-10). It should be noted that the cited appendices of NUREG 0600 list potential items of noncompliance with NRC regulations which were identified during the investigation. As a result of additional NRC reviews and because of mitigating circumstances, not all of the potential items identified in NUREG 0600 were found to be items of noncompliance. The Notice of Violation transmitted to the licensee by letter dated October 25, 1979, from the Director, Office of Inspection and Enforcement contains the actual items of noncompliance which were cited by NRC. Three of these eleven items were later withdrawn when they were not found to exist as cited. This is documented in a subsequent NRC letter to the licensee dated January 23, 1980. However, the three items which ANGRY has emphasized in this contention remain as indicated in NUREG-0600. A summary of the referenced letters, the items of noncompliance cited by NRC, the licensee's responses to the

cited noncompliances and NRC's evaluations of the licensee's responses are contained in Appendix A to NUREG-0680, Supp. No. 1, dated November 28, 1980.

Q.6 In general, what is the nature of the items of noncompliance cited by NRC?

A. As stated in the aforementioned letter of October 25, 1979, the identified noncompliances demonstrated weaknesses in the licensee's management controls just prior to and during the TMI-2 accident. These weaknesses existed mainly in the general areas of: development and review of procedures; adherence to approved procedures and Technical Specification; control of maintenance activities (recordkeeping); training and retraining for emergency and radiation protection personnel; and, implementation of the radiation protection program. These weaknesses caused, contributed to or otherwise impacted adversely on the accident.

Q.7 How has the licensee responded to the cited items of noncompliance?

A. In a letter of December 5, 1979, which responded to the NRC's letter and Notice of Violation arising from its investigation, the licensee committed to changes in management and management controls to upgrade its nuclear program. It also committed to take corrective actions with regard to the specific items of noncompliance. In a subsequent letter from the licensee

dated July 21, 1980 and in NRC's response letter, dated November 20, 1980, to that letter, the licensee's specific corrective actions with respect to TMI-1 are stated. The NRC's letter also contains clarifications and documents additional corrective action commitments relative to TMI-1. Evaluations of the proposed corrective actions to enable safe operation of the plant and to provide for the protection of public health and safety have been made by the Staff and found to be acceptable. A summary of the referenced letters, items of noncompliance cited by NRC, the licensee's responses to the cited noncompliances and NRC's evaluations of the licensee's responses are contained in Appendix A to NUREG-0680, Supp. No. 1, dated November 28, 1980. The Staff will verify implementation of these actions by the licensee and will monitor their effectiveness prior to the Staff's final determination regarding authorization for restart of TMI-1 and subsequent to restart, should restart be authorized.

- Q.8 What specific corrective actions have been taken by the licensee to the cited items of noncompliance?
- A. The licensee's specific corrective actions, already initiated or proposed, and the NRC's evaluation of these actions are discussed, in detail, in Appendix A to NUREG-0680, Supp. 1, dated November 28, 1980 and, therefore, are not restated herein. However, with respect to the three actions emphasized by ANGRY in its contention, the licensee disagreed with NRC's assessment that these actions, in and of themselves, constituted noncompliance. Detailed analyses of these actions, including the licensee's bases

for disagreement, are contained in the licensee's letter to NRC dated December 5, 1979. Notwithstanding this disagreement, the licensee also stated corrective actions which, when implemented, provide reasonable assurance that the root problems have been adequately addressed. These corrective actions, and the NRC's evaluations thereof, are contained in the licensee's letters of December 5, 1979 and July 21, 1980, and NRC's letters of January 23 and November 20, 1980, respectively. Summaries are also contained in Appendix A to NUREG-0680, Supp. 1, dated November 28, 1980.

Q.9 Has the licensee taken any other actions as a result of NRC concerns besides those actions in response to specific items of noncompliance?

A. It should be noted that although the licensee's corrective actions to specific items of noncompliance are pointed toward correction of those deficiencies, in many cases, the corrective actions are applicable also to more potentially generic problems rather than just the specific problem cited and, thereby, provide strengthened management controls in other areas as well. For example, relative to isolation of both TMI-2 emergency feedwater flow paths (ANGRY's emphasized item (a)), the licensee will review all surveillance and test procedures, as well as administrative control procedures for the conduct of surveillances and tests, to ensure that, in carrying out any of these procedures, redundant systems operability would never be jeopardized. In addition, a formal, routine shift

check will be instituted for those systems necessary for safe, plant operation. With respect to failing to correct reactor coolant leakage through the pressurizer relief valve and throttling of high pressure injection flow (ANGRY's emphasized item (b) and (c)), the licensee has instituted integrated training in plant operations, diagnosis of off-normal symptoms, implementation of procedures etc. and has held meetings with the plant operating staff to discuss management commitments in these areas. The licensee also has made major changes in the overall management organization involved in its nuclear operations. These changes affect other nuclear facilities, i.e., TMI-2 and Jersey Central Power and Light Company's Oyster Creek Nuclear Generation Station. The organization changes are discussed in Section III.B.2, 3 and 4 of NUREG-0680, Supp. 1, dated Novr '8, 1980.

Q.10 Do the major organizational changes increase the licensee's management capability to operate a nuclear power plant?

A. The organizational changes made by the licensee since the TMI-2 accident are an effort to provide strengthened management and technical support for the Three Mile Island Station, including TMI-1. The major change combined the nuclear oriented technical and management resources of Metropolitan Edison Company (Met-Ed), GPU Service Corporation and Jersey Central Power and Light Company (JCP&L Co.) into a single organizational entity identified as the GPU Nuclear Group. This group, headed by a

Chief Operating Executive is responsible to the licensee for management of TMI-1 restart activities, TMI-2 recovery activities, and to JCP&L Co. for Oyster Creek operation. This organization change was approved by NRC for implementation on September 15, 1980, as Amendment No. 93 to the TMI-1 Technical Specifications. In making this change, the licensee has increased substantially the total overall management and technical resources available for TMI-1 restart. Additionally, experienced managers and professionals have been introduced at both the corporate and plant levels of the organization. This centralized, nuclear oriented group is expected to provide increased management capability to focus on nuclear operational matters, as well as personnel policies and procedures applicable to nuclear activities. This new organization is being monitored currently by the NRC staff to determine its capability to deal with TMI-1 restart, TMI-2, and the activities of the other nuclear plants for which it has responsibility. This determination will be complete prior to the Staff's decision concerning TMI-1 restart.

Q.11 How is the corporate staff currently organized?

- A. Under an executive office, comprising a chief and deputy chief operating executive, reporting directly to the presidents of the two NRC licensed utilities and the GPU Service Corporation, are corporate level support divisions with six functional areas of responsibility. These are: Technical Functions; Nuclear Assurance; Administration; Radiological and Environmental Controls; Maintenance and Construction; and, Communications.

Q.12 What are the functions of these corporate level support divisions?

A. The Director Technical Functions provides a centralized, technical capability to support all aspects of nuclear activities. The Director Nuclear Assurance supports nuclear operations in the areas of quality assurance, safety assessment, emergency preparedness, training and operational safety. The Director Administration is responsible for business management and administrative support services, including physical protection of TMI-1 (security), for the GPU Nuclear Group. The Director Radiological and Environmental Controls is responsible for establishing and implementing radiological and environmental policies, practices and procedures for nuclear plant operations. The Director Maintenance and Construction establishes and monitors policies, practices and procedures for maintenance, repair and construction activities, and carries out plant modifications and major and specialized maintenance activities. The Director Communications establishes and implements policies and programs for communications with news media, government and citizens groups during normal and emergency activities. In addition to the specific functions stated above, these support divisions are intended to provide technical reviews and operational trend analyses, independent of the on-site TMI-1 staff. Also, the licensee intends to implement the following two review groups:

- Independent Onsite Safety Review Group (IOSRG): this is a group of multi-disciplined, technical personnel, assigned at the TMI-1 site but reporting to the corporate level Nuclear Assurance Division.

This group will review safety significant plant operations procedures for technical adequacy and clarity, evaluate operations from a safety perspective and review proposed changes to the facility, technical specifications, tests and experiments, and unreviewed safety matters as well as other NRC regulatory matters.

- General Office Review Board (GORB): this is a multi-disciplined, senior level, overview group, reporting to the Chief Operating Executive, with responsibility to anticipate potentially significant nuclear safety and radiation problems and recommend measures to avoid or mitigate such problems. The GORB has a permanent, full-time Chairman and a permanent Vice-Chairman (who is also the Manager, Nuclear Safety Assessment Division). About nine additional members, assigned to TMI-1 matters only, complete the group. The Chairman and Vice-Chairman also serve in similar capacities on the GORB's for TMI-2 and Oyster Creek.

Q.13 What organizational changes have been made at the TMI-1 plant level?

- A. At the plant level, the line management responsibilities, i.e., the operation and maintenance for TMI-1 and TMI-2 has been separated completely. Operation of TMI-1 is under the full-time, on-site, direct supervision of the Director, TMI-1, who reports to the Executive Office of the GPU Nuclear Group. Reporting to the Director TMI-1 is the Manager Unit 1 -

who is responsible for plant operations and maintenance activities; the Manager Plant Engineering - who directs a group of engineers disciplined in nuclear, mechanical, fire protection, chemistry, electrical and instrument/controls engineering; and, the Manager Administration and Services - who is responsible for personnel and plant security, budget/cost control and general administration. A Safety Review Manager, currently also reporting to the Director TMI-1, is assigned to review Technical Specification submittals, unreviewed safety questions and other nuclear safety significant matters. The licensee intends that the Safety Review Manager will become, in the future, the manager of the IOSRG and will report to the corporate level, Nuclear Safety Assessment Division.

Q.14 What are the specific responsibilities of the Manager Unit 1?

- A. The Manager Unit 1 is responsible for the day-to-day operation and maintenance of the plant only. The Manager Unit 1 has been relieved of the responsibilities for directing the administration, training, engineering, radiation protection and chemistry functions by assigning these duties to other managers on site. Reporting to the Manager Unit 1 is the Operations Supervisor, who directs the six operating shift crews, and the Superintendent of Maintenance, who directs two distinct maintenance groups: one group charged with the conduct of preventive maintenance and another which carries out corrective maintenance. Both maintenance groups are composed of personnel with specialized expertise in mechanical, electrical and instrumentation/controls maintenance. Also, additional maintenance

Personnel, reporting to the Superintendent of Maintenance, are assigned on a shift basis.

Q.15 What other plant specific organization changes have been instituted?

A. On-shift safety support is provided by assigning a degreed engineer with specialized, plant specific, normal and abnormal operations training to each shift. This Shift Technical Advisor reports to the Manager Plant Engineering and provides the operating shift with technical liaison and coordination with the Plant Engineering and Technical Functions staffs.

A Training Coordinator has been assigned to the Manager Unit 1. His function is to provide liaison between the plant operations and maintenance staff and the Manager of Training, TMI-1 in the GPU Nuclear Group relative to specific and specialized training needs and to coordinate the training activities for these personnel through the Manager Unit 1.

The on-site radiological controls function, under the Manager Radiological Controls - Unit 1, reports off-site to the Director Radiological and Environmental Controls in the GPU Nuclear Group. Routine day-to-day liaison and coordination of radiological matters with plant operations and maintenance activities are provided through the Director TMI-1.

The Quality Assurance (QA) staff assigned to the TMI site has been significantly increased; from about 12 prior to the TMI-2 accident, to about 43

at this time. The on-site QA staff comprises expertise in diverse areas of QA, e.g. design and procurement, material technology, audits, modifications and operations, and is supported by a significantly increased staff in the corporate QA Department which is part of the Nuclear Assurance Division. An on-site manager, who monitors the overall implementation of the site QA program, reports directly to the corporate Manager Quality Assurance. He also interfaces with station management regarding operationally oriented QA matters but is organizationally independent from the operating staff.

Q.16 How would you assess the organizational changes made by the licensee as they relate to management capability for an operating nuclear power plant?

A. The changes effected by the licensee in both off-site and on-site management organizations, combined with the introduction of additional experienced management and professional personnel at all levels of the organization, appear to have increased significantly the licensee's capability to manage the operation of TMI-1 in a safe manner and with due regard to the protection of public health and safety. These changes were initiated at this time, and in large part, as a direct result of the accident at TMI-2 as it became evident to the licensee that its approach to management and management controls, both at the corporate and plant levels, were weak in certain areas and would require substantial upgrading if approval for

further operation of the plant was sought from NRC. In addition to others' investigations of the accident, the licensee apparently undertook extensive reviews of its overall management structure, management organization for supporting, staffing and operating its nuclear plants and policies and procedures for their operation and has instituted changes as a result of these reviews. In establishing the revised organization, the licensee has endeavored to provide for adequate on-site management, staffing and expertise to support the day-to-day routine operation of the plant, as well as non-routine and emergency plant operations, while maintaining sufficient off-site (corporate) management and technical expertise to direct and support plant operations both routinely and during periods of non-routine activities. The organizational changes were made over a period of time, and in several stages, as the needs became apparent as a result of continuing reviews by the licensee.

In September 1980, the NRC, after review and evaluation of these changes, approved the new organization for implementation at TMI-1 for the current status of the plant. Monitoring of the new organization between then and the time of the licensee's proposed restart of Unit 1 will provide the Staff with a basis for determining the capability of the organization in managing current plant activities and for projecting its capability if restart is permitted. This determination is on-going and is being conducted by various offices within NRC in order to ensure that all aspects of the reorganization are covered adequately. Additional details concerning the

licensee's management capability and technical competence are contained in NUREG-0680, Supp. 1, dated November 28, 1980.

Q.17 What conclusions can be drawn about the licensee's management capability to operate a nuclear power station based upon the licensee's commitments for corrective actions and changes in the organization, policies, programs and procedures?

A. The licensee has made and continues to make a sincere effort to correct prior deficiencies in the operation of TMI-1. The commitments and changes already made and those proposed by the licensee for the restart and future operation of TMI-1 are diverse and significant. The organization changes made at the corporate and plant level provide an appreciably strengthened management capability. Also, the introduction of new personnel with varied backgrounds and experience into the organization, at all levels, complements the new organization and increases its technical competence.

Likewise, corrective actions taken and those planned and documented by the licensee relative to previous items of noncompliance cited by NRC, as well as other program changes resulting from licensee and NRC reviews and investigation following the accident, should enable the licensee to operate TMI-1 in a safe manner. Based upon the licensee's commitments for corrective actions and changes in the organization, policies, programs and procedures, and upon full implementations of these commitments, it appears that the

licensee will be capable of operating a nuclear power plant safely and with due regard to public health and safety. However, the Staff will continue to review these matters, inspect implementation on a schedule consistent with the licensee's proposed restart date and monitor the effectiveness of the changes and their interaction with each other.

Department: PHSND Branch, Region I - DIE

Title: Chief, Reactor Projects Section No. 1

Grade: GS-15

Birth Date: 3/31/40

Education: Bachelor of Marine Science-Engineering, Maine Maritime Academy, 1962
Nuclear Power Technology, U.S. Merchant Marine Academy, 1963
Reactor Technology, Health Physics and Experimental Reactor Operations, Texas A&M, 1964
Water Chemistry for Nuclear Power Plants-Treatment and Analysis, Calgon Laboratory, Inc., 1964

Licenses: Professional Engineer-Nuclear Engineering, State of California
Second Assistant Engineer, Steam Unlimited, U.S.C.G.
Third Assistant Engineer, Diesel Unlimited, U.S.C.G.
Senior Reactor Operator-U.S. AEC (Expired)

Certificate: Staff Water Chemist, FAST, Inc.

Professional Society: American Nuclear Society

Experience:

4/78 - Present Chief, Reactor Projects Section - Responsible for the project management of the DIE inspection program for reactors in preoperational testing, startup testing, and operational phases at resident and non-resident inspector sites.

5/77 - 1/78 Chief, Nuclear Material Control Support Section (Acting) - Temporarily detailed to supervise the activities of a section that provides specialized support in the area of nuclear material control and accountability. (NRC:RI)

2/77 - 4/77 Chief, Nuclear Support Section No. 2 - Responsible for the supervision of a section that provides specialized support in the areas of quality assurance, plant procedures and operator requalification training. (NRC:RI)

6/76 - 10/76 and 1/78 - 4/78

10/76 - 2/77 Chief, Reactor Construction Projects Section (Acting): Temporarily assigned to supervise the activities of a section that provides project management for nuclear power facilities under construction. (NRC:RI)

12/73 - 6/76 and 6/72 - 4/73 Reactor Inspector, Reactor Construction Project Section - Responsible for the inspection of nuclear reactor facilities under construction. Also, served as Principal Inspector for Lead Region for SNUPPS project. (AEC/NRC:RI)

4/73 - 12/73 Reactor Inspector, Reactor Test and Startup Branch - Responsible for the inspection of nuclear reactor facilities during pre-operational and startup testing activities. (AEC:RI)

2/71 - 6/72 Senior Operations Engineer, Burns and Roe, Inc. - Responsible for the supervision of a project group engaged in the preparation of system design descriptions, pre-operational test and operating procedures for nuclear and conventional plant systems for a utility nuclear power facility. Also, responsible for planning and directing the acceptance, performance, pre-operational and startup testing prior to commercial operation. In addition, served as A/E representative on utility, NSSS, E/C and A/E joint test group.

10/66 - 1/71 Senior Operations Analyst, First Atomic Ship Transport, Inc. - Responsible for the preparation and auditing of reactor and conventional plant procedures used aboard the N.S. Savannah and for the analyses of reactor plant operations. Also served as Shift Superintendent during the vessels first refueling and acted as liaison with regulatory agencies and contractors.

6/62 - 9/56 Second & Third Assistant Engineer, American Export-Isbrandtson Lines - Served as Watch Supervisor aboard N.S. Savannah. Responsible for the operation, maintenance, testing and other related activities concerned with the reactor and conventional power plant. Also served aboard various company vessels with responsibility for the operation and maintenance of conventional (fossil) power plants.

POOR ORIGINAL