REPORT IN RESPONSE TO NRC STAFF

RECOMMENDED REQUIREMENTS FOR RESTART OF

THREE MILE ISLAND NUCLEAR STATION UNIT 1

AMENDMENT 20

INSTRUCTIONS

Those sheets of the TMI-1 Restart Report listed in the left-hand column are to be deleted and, where appropriate, replaced with the revised sheets listed in the column on the right.

REMOVE	INSERT
Section 5	Section 5
Remove Entire Section	Insert Entire Section

5.0 THREE MILE ISLAND NUCLEAR STATION ORGANIZATION

5.1 GENERAL

Following the TMI-2 accident, Metropolitan Edison Company recognized through its own and other investigations of the accident that major organizational changes were desirable for more effective management control. These changes indicate Met-Ed's commitment to operational safety and provide significant improvement in the control of operational activities, and the technical and management resources directing and supporting facility operations.

The first step taken was to combine the technical and management resources of Met-Ed and GPU Service Corporation Generation Divisions into a single organizational entity identified as the TMI Generation Group.

The TMI Generation Group was formed on July 30, 1979, to strengthen the overall management and provide greatly increased technical resources for the restart of TMI Unit 1 and the recovery of TMI Unit 2. The Group is headed by R. C. Arnold. To effect this new organization, Mr. Arnold was elected to the position of Senior Vice President of Met-Ed, and he continues to serve as a Vice President of GPU Service Corporation. In this position, Mr. Arnold reports to Herman M. Dieckamp, President of GPU and GPUSC, and acting president of Met-Ed. This reporting structure provides a direct link from the Chief Operating Officer of these three companies to the activities at TMI. The primary objective of the TMI Generation Group is to operate and maintain the plant safely and in accordance with all laws, NRC Regulations, Technical Specifications and established procedures.

This group was formed to take advantage of the wealth of nuclear experience represented by management and technical staff from within the GPU Service Corporation and Metropolitan Edison Company. This realignment more than tripled the number of professionals that have TMI as their primary responsibility.

There are senior management personnel with an average technical experience well over 20 years reporting to the head of the TMI Generation Group in the areas of:

- TMI-1 Operations
- TMI-2 Recovery

- Nuclear Assurance
- Technical Functions
- Unit-2 Radiological Controls
- Administration

Various steps were taken in this reorganization to strengthen key functions in the operation and support for TMI-1. Examples of this were:

- The line management responsibilities for TMI-1 and 2 were completely separated.
- Each TMI unit has to the maximum extent feasible, direct control of the resources necessary for effective and safe conduct of plant activities.
- The Vice President TMI-1 served full time at TMI.
- The TMI-1 Operations organization specifically gave the TMI-1 Manager only the responsibility for Operations and Maintenance and relieved him of the direction of administration, training, engineering, radiation protection and chemistry functions.
- The GPU Service Corporation and Metropolitan Edison Company Quality Assurance and Control organizations were merged, and Operating Quality Assurance for TMI is their major function.

As a final step, all of the nuclear expertise of the GPU System, including that of GPU Service Corporation, Metropolitan Edison Company and Jersey Central Power and Light Company, has been combined to form the Nuclear Generation Group. When all regulatory approvals are obtained, the Nuclear Generation Group will become GPU Nuclear Corporation. GPU Nuclear Corporation will provide design operation, and maintenance services for the GPU system nuclear plants. The advantages of the centralization of nuclear expertise included:

- Additional expertise and diverse experience added from JCP&L

- The ability to focus greater expertise on any area on short notice

- Greater opportunity for exchange of experience

- Increased efficiency under emergency conditions due to pre-existing working relationships.

- Personnel policies and procedures appropriate to nuclear activities

The President of GPU Nuclear Corporation is Mr. Robert C. Arnold. The Executive Vice President is Mr. Phillip R. Clark. Together they form the Office of the President. Reporting to the office of the President are nine Vice Presidents, one for each nuclear unit and one for each common function--Nuclear Assurance, Administration, Technical Functions, Communications, Radiological & Environmental Controls, and Maintenance & Construction. The necessary separation of functions for TMI-1 and TMI-2 and the other advantages created by the TMI Generation Group were be preserved and strengthened in GPU Nuclear Corporation.

In addition, the independent review functions formally carried out by the Plant Operations Review Committee (PORC) are performed by organizational units including the plant staff, Technical Functions Quality Assurance, and an Independent Onsite Safety Review Committee (IOSRC). The IOSRC is located onsite, but will be independent of the plant staff, and reports to management offsite. The General Office Review Board (GORB) has also been strengthened. (See Section 5.4.)

The following sections describe the pertinent details of GPU Nuclear Corporation. Until GPU Nuclear is formed officially, the titles of various positions will be as indicated below, and GPU Nuclear Corp. will be known as the Nuclear Generation Group. All functional responsibilities for the Nuclear Generation Group will be as described for GPU Nuclear:

GPU Nuclear Title	Nuclear Generation Group Equivalent
President	Chief Operating Executive
Executive Vice President	Department Chief Operating Exec.
Vice President - TMI-1	Director - TMI-1
Vice President - TMI-2	Director - TMI-2
Vice President - Oyster Creek	Director - Oyster Creek
Vice President - Technical Functions	Director - Technical Function
Vice President - Nuclear Assurance	Director - Nuclear Assurance
Vice President - Administration	Director - Administration
Vice President - Radiological & Environmental Control	Director - Radiological & Enviornmental Control
Vice President - Maintenance & Construction	Director - Maintenance Construction
Vice President - Communications	Director - Communications

5.2 STATION ORGANIZATION

The Vice President TMI-1 utilizes the following management staff in carrying out his responsibilities:

- Manager Plant Engineering
- Manager TMI-1
- Manager Administration and Services

The Three Mile Island Nuclear Station organization as shown in Figure 5.2-1 will function in three principal areas under the managers listed above: Unit 1 Operations and Maintenance, Plant Engineering, and Administration and Services.

The Operations Group under the Manager Unit 1 will be responsible for the day-to-day quality of operations and preventive and corrective maintenance activities associated with the unit. TMI-1 will have a Shift Supervisor assigned only to TMI-1, who reports to the TMI-1 Operations Supervisor directing the operations on each of six shifts through the assigned TMI-1 Shift Foremen, Control Room Operators, and Auxiliary Operators.

The TMI-1 Plant Engineering Group, under the Manager Plant Engineering includes lead engineers in nuclear, mechanical, electrical, and instrument and control engineering disciplines to whom other engineers and analysts assigned to TMI-1 will report. Shift Technical Advisors (STA) with engineering degrees are assigned to each of the six operating shifts wotj a @ro,aru responsibility to advise the Shift Supervisor under normal and abnormal conditions. They do maintain technical liaison and coordination between operating shift personnel and the plant engineering and Technical Functions Division staffs. The STA's report in the Technical Functions Division. In addition, a Supervisor Chemistry and a Technical Analyst (Fire Protection) support the requirements of TMI-1 in their assigned areas.

The Training Department, under the Manager of Training, who reports to the Director of Training and Operational Safety Support within the Nuclear Assurance Division, will provide TMI-1 Training Support in the three main areas of Operator Training, Technician Training, and Career Development Training. Coordination between Unit-1 and the Training Department is the responsibility of the Training Coordinator, who reports to the Manager TMI-1. The Operator Training Section is organized to support both licensed operator and non-licensed operator training. The Technician Training Section will support training of technicians in the maintenance, chemistry and health physics areas. The Career Development Section will conduct general employee training, supervisor and management training and educational development programs. The managerial staff reporting to the TMI-1 Vice President will evaluate and, as appropriate, approve the adequacy of the existing TMI-1 level of training of assigned personnel.

The Administration and Services Group will coordinate the areas of facilities, budgets/cost control, personnel, station security, procedure coordination, and general administration with direct support and guidance from the Administration Division under the Vice President Administration.

The Vice President Radiological & Environmental Controls, using the TMI-1 Manager Radiological Controls, will provide for the areas of Radiological Control Program support, and enforcement as detailed in the approved Radiological Protection Plan, implementing procedures, training plan, and the Bioassay and Respiratory Protection programs. Additionally, the group will conduct surveys and assessments related to protective controls in order to assure that radiological control work practices are accomplished in compliance with approved procedures and applicable regulations. Onsite and Offsite Radiological and Non-Radiological Environmental Monitoring Support is also provided by the Vice President of Radiological & Environmental Control.

The Technical Functions Personal the General Office Review Board and the Independent Onsite Safety Review Committee (IOSRC), under the Safety Review Manager review activities specified in the Technical Specifications that are important to safety (See Section 5.4).

The following subsections detail the functions and responsibilities of various supervisory personnel located onsite.

5.2.1 Vice President - TMI-1

a. Function

The Vice President, in carrying out his management responsibilities for day-to-day plant operations, directs the management staff, identified in Paragraph 5.2 Station Organization, in executing the following TMI-1 operational functions:

Shift daily operations and surveillance in accordance with Technical Specification requirements.

Preventive and corrective maintenance.

Administrative controls related to Technical Specification compliance not specifically assigned elsewhere.

Primary and Secondary plant Chemistry.

Refueling operations and operational related shutdown surveillance requirements.

Evaluation of the training of his staff, including licensed and non-licensed operations personnel, chemistry technicians, and maintenance personnel.

Planning of day-to-day maintenance, operations surveillance and refueling activities.

Plant engineering support of maintenance requirements and shift operations, including liaison with the onsite offsite Technical Functions Division staff.

b. Responsibility

The Vice President - in carrying out his responsibility for overall direction of day-to-day TMI-1 operations is responsible for:

TMI-1 Technical Specification and Regulatory Requirements compliance, (unless specifically assigned elsewhere).

Direction of the Manager, TMI-1 in the execution of his responsibilities, which are set forth in Paragraph 6.1 of the TMI-1 Technical Specifications.

TMI-1 compliance with all commitments made in the TMI-1 Restart Report Submitted in response to the TMI-1 Shutdown Order dated August 9, 1979, unless specifically assigned elsewhere.

Implementation and compliance with the approved Radiation Protection Plan, Quality Assurance Plan, the Security Plan, the Radiation Emergency Plan, the Fire Protection Plan, evaluating and, as appropriate, approving the adequacy of the existing level of training of his staff including licensed operators, non-licensed operators, maintenance personnel, and Chemistry Technicians.

Direct interface with the Division Vice Presidents identified in Paragraph 5.3 to insure that the necessary TMI-1 support is provided including Engineering Change Modification coordinated review and approval, major corrective maintenance and construction, Training, Nuclear Safety Analysis, Quality Assurance, Licensing, Licensee Event Report review, laboratory analysis, IOSRC support in accordance with the TMI-1 Technical Specifications and Radiological & Environmental controls.

Insuring the continuing TMI-1 staff readiness to implement the Emergency Plan by coordinating staff Emergency Plan drills and training through the "Emergency Plan Coordinator," and approving the qualifications and level of training achieved by the TMI-1 staff assigned duties in the Emergency Plan.

Development and implementation of the TMI-1 Annual Operating Plan, personnel plan, and corresponding budget to insure adequate levels of manning and proper work priorities.

c. Authority

The Vice President has the authority to: Operate the plant in accordance with its license and other applicable requirements.

Order the shutdown and cooldown of TMI-1 whenever the health and safety of the public is endangered, or when in his judgement a shutdown is warranted.

Initiate emergency procurement.

Approve the adequacy of individual qualifications and the adequacy of achieved levels of training.

Approve recommendations from the IOSRC regarding activities in the Technical Specifications that are important to safety.

d. Minimum Qualifications

The Vice President TMI-1 shall possess as a minimum the qualifications outlined in ANSI/ANS 3.1-1978, Section 4.2.1, Plant Manager. The Vice President shall have ten years of responsible power plant experience, of which a minimum of three years shall be nuclear power plant experience. A maximum of four years of the remaining seven years of experience may be fulfilled by academic training on a one-for-one time basis. To be acceptable, this academic training shall be in an engineering or scientific field generally associated with power production. The Vice President shall have acquired the experience and training normally required for examination by the NRC for a Senior Reactor Operator's License whether or not the examination is taken.

e. Incumbent Qualifications

The Vice President TMI-1 received a Bachelor of Science Degree from the U.S. Navy Academy in 1953. He served on active duty in the U.S. Navy for more than 22 years until December 31, 1975. His naval assignments were primarily involved with the construction, maintenance and operation of nuclear submarines, and included completion of one year of naval nuclear power training resulting in qualification as a Chief Operator of the S-3-G landbased prototype reactor plant; tours as Division Officer for the Reactor

Control, Mechanical, an Electrical divisions aboard a nuclear submarine; a tour as Chief Engineer; and five years in command of a nuclear submarine, which encompassed a reactor refueling and major overhaul. During his last four years on active duty, he was assigned as a Special Assistant and Senior Officer on the Staff, Director Division of Naval Reactors, Department of Energy. In this capacity, he was directly responsible for the selection and engineering training of all nuclear ship Commanding Officers. He was also directly involved in the establishment and enforcement of standards and procedures for the safe and proper operation of all naval nuclear propulsion plants. From January 1976 to February 1977, he served as the Project Operations Manager, Clinch River Breeder Reactor Plant Project for Burns and Roe, Inc. In February 1977, he went back to work for the Department of the Navy as a Senior Civilian Special Assistant to the Commander, Naval Sea Systems Command. In this position, he was responsible for all matters related to the selection, education, qualification, training and professional performance of the Navy's more than 1200 Engineering Duty Officers. In June 1980, came to GPU as prospective Director, TMI-1, and will be serving in that capacity well prior to TMI-1 restart.

f. Interfaces

The Vice President reports to and is held accountable for TMI-1 operations by the Office of the President of GPU Nuclear.

In carrying out his management responsibility for day-to-day TMI-1 operations, the Vice President interfaces and communicates with other Vice Presidents shown on Figure 5.3-1, who provid support for TMI-1 and report to the Office of the President of GPU Nuclear.

The Vice President TMI-1 interfaces and communicates directly with the Vice President TMI-2 to ensure the separation and independence of TMI-2 decontamination and restoration activities from TMI-1.

The Vice President TMI-1 is supported by other various components of GPU Nuclear for support in the areas of: Engineering, Process Computers, Safety Analysis, Fuel Performance and Fuel Management, Training, Radiological Controls, Emergency Planning and Quality Assurance, Security and Administration, and Maintenance & Construction.

5.2.2 Manager TMI-1

a. Function

The Manager reports directly to the Vice President TMI-1 and assists him in the overall operation of TMI-1.

b. Responsibility

This position has direct responsibility for operating the unit in a safe, reliable and efficient manner; is responsible for off site radioactive discharges and bears the responsibility for compliance with the operating licenses and the rules and regulations of the Commonwealth of Pennsylvania; supervises the Operations Group and Maintenance Group and the Radioactive Waste Processing and Shipment Group.

c. Authority

The authority of the Manager, to act on behalf of the Vice President TMI-1, is inherent in the position and commensurate with the assigned responsibilities. It includes the authority to order the shutdown and cooldown of TMI-1 whenever the health and safety of the public is endangered or when in his judgement a shutdown is warranted. It also includes the authority to issue procedures, orders, and other directives required in the execution of the assigned responsibilities. Necessarily included in the responsibility for plant operation, compliance with Technical Specifications, is the authority to assign and prioritize requirements to the Plant Engineering, Training and Administration and Services Groups. Similarly, the authority of the Manager includes the initiation and prioritization of corrective maintenance and preventative maintenance in the execution of his responsibilities. The Manager may delegate his authority to the Supervisor of Operations or Shift Supervisor during absences. This delegation of authority extends to the issuance of standing orders and directives in support of the responsibilities assigned. In the absence or incapacitation of the Vice President TMI-1, this Manager is delegated the authority of that office for the centralized control, supervision, coordination and planning of all aspects of TMI-1 Operations.

d. Minimum Qualifications

The Manager TMI-1 shall posses a Bachelors degree in Science or Engineering and eight years of responsible power plant experience of which at least three years will be in nuclear power plant design, construction, startup, operation, maintenance, or technical services. A maximum of two years of the remaining five may be fulfilled by academic training. This manager shall have acquired the experience and training normally required for examination by the NRC for a SRO license whether or not the examination is taken.

e. Incumbent Qualifications

Education:

Graduated from Newark College of Engineering - Newark, New Jersey in 1966 with BSEE.

Work Experience:

Worked for Pacific Gas and Electric as a Construction Engineer supervising the installation of the Electrical Switchgear and Power Train in the Moss Landing Generating Station from June 1966 to March 1967.

As a Distribution Engineer for Jersey Central Power and Light, the incumbent designed overhead and underground residential power systems from March 1967 to February 1968.

Worked for GPU as a Station Engineer at Oyster Creek from February 1968 until December 1970. During this time, the incumbent worked two years on shift as a Shift Test Engineer, obtained a CRO License in September 1969, obtained a SRO License in March of 1970, and trained a class of operators for licensing in 1970.

From January 1971 until September 1974, the incumbent was the Assistant Test Superintendent for GPU at TMI-1. During this time frame, he made the schedule that was used for the program from energizing the Auxiliary Transformers through Commercial Operation, worked six weeks at Oyster Creek as a Refueling Supervisor, directed the Shift Test Engineers in performance of TMI-1 testing, and performed as a Shift Test Director during the low power physics program and the power escalation program.

From September 1974 until December 1978, the incumbent was the Test Superintendent for TMI-2. In this capacity, he had full responsibility for the construction, pre-operational and power escalation testing.

From January 1979 until January 1980, the incumbent was the Unit Superintendent in charge of two 650 mwe Coal Fire Units at Penelec's Homer City Station. In this capacity, he was responsible for Engineering, Maintenance, and Operation.

f. Interfaces

1. Offsite

The Manager interfaces with company, corporate, local Commonwealth of Pennsylvania, and Federal Government organizations in fulfillment of responsibilities assigned, State and Federal regulations, and directives received.

5.2.3 Supervisor of Operations

a. Function

The Supervisor of Operations has the responsibility for directing the actual day-to-day operation of the unit. He reports directly to the Manager, TMI-1. The Supervisor of Operations coordinates operations and related maintenance activities with the Superintendent of Maintenance.

b. Responsibility

This position is responsible for the day-to-day direction of the Operations personnel to ensure compliance with the conditions of the plant operating license and the Technical Specifications. He is also responsible for the supervision of the TMI-1 Radioactive Waste Processing and Shipment Group.

c. Authority

The Supervisor of Operations TMI-1 has the authority to shutdown and cooldown of TMI-1 whenever the health and safety of the public is endangered or when, in his judgement, a shutdown is warranted.

d. Minimum Qualifications

The Supervisor of Operations will have a minimum of six years of responsible power plant experience of which at least one year will be in nuclear power plant design, construction, startup, operations, maintenance, or technical services. A maximum of two years academic or related training may be included as part of the remaining five years of power plant experience. The Supervisor of Operations shall hold a Senior Reactor Operators License.

e. Incumbent Qualifications

Education:	High School Graduate 1960
Military Service:	U.S. Navy - 1960-1968

Relevant Assignments/Training: U.S. Navy Nuclear Power School (26 weeks) - 1961

Nuclear Power Prototype School 1961

Reactor Operator - USS HADDO - 1962-1965

Instructor - Nuclear Power Training Unit - 1965-1966 (Qualified as Engineering Officer)

AEC Field Representative at NPTU - 1966-1968 (Passed Nuclear Engineer Examination)

Operations Staff and Instructor - Saxton Nuclear Experimental Corporation - Licensed Reactor Operator - 1968-1970

Shift Foreman - TMI - Aug. 1970-July 1972

Shift Supervisor - TMI-1 - July 1972-April 1978 and obtained SRO License in February 1974

Supervisor of Operations - TMI-1 April 1978-Present

f. Interfaces

1. Onsite

The Supervisor of Operations onsite interfaces include the Superintendent of Maintenance, the Emergency Planning Coordinator, the Manager Radiological Controls, Manager Plant Engineering, and the Training Coordinator.

5.2.4 Training Coordinator

a. Function

The Training Coordinator reports to the Manager, TMI-1. In this position, he will coordinate TMI-1 in-plant training activities, and assess the adequacy of training of Operations, and Maintenance/Chemistry Technicians for TMI-1 Managers within their departments, in cooperation with the training group in the Nuclear Assurance Division.

b. Responsibility

This position is responsible for the following activities:

- Coordinating shift training.
- Scheduling performance reviews to determine the adequacy of training within the TMI-1 functional groups.
- Providing liaison for TMI-1 with the training group in the Nuclear Assurance Division in conducting training needs analysis and establishing training requirements.
- Coordination and scheduling of personnel in the Operations Department to determine whether qualifications and achieved training levels are sufficient to recommend administration of NRC Licensing Examinations.

c. Authority

The Training Coordinator has the authority to coordinate department in-plant training schedules subject to the approval of the Manager TMI-1. He also has the authority for direct interface and liaison with the Training Department and the TMI-1 Managers.

d. Minimum Qualifications

High School Graduate
Four Years Nuclear Power Plant Experience

e. Incumbent Qualifications

Position Vacant

f. Interface

The Training Coordinator will maintain liaison with the Training Department in the Nuclear Assurance Division and with TMI-1 Department Managers and Supervisors in carrying out his training coordinating and scheduling functions.

5.2.5 Supervisor - Radwaste, Nuclear

a. Function

The Supervisor - Radwaste Nuclear reports to and is held accountable for radwaste operations by the TMI-1 Operations Supervisor. The Supervisor-Radwaste Nuclear, in carrying out his supervisory responsibility in Radwaste Operations, directs the Radwaste Foremen and Radwaste Utility workers in executing the following TMI-1 functions:

- Packaging of solid radwaste including both compacting and solidification.
- On-site temporary storage of radwaste material.
- Coordination of all shipments of radioactive waste material from TMI-1.
- Operation of the waste solidification system at TMI-1.
- Training of radwaste personnel in regulatory requirements.
- Minimizing the volume of radwaste generated and disposed of by the Unit.
- Proper documentation and shipment of radwaste in compliance with applicable regulations.

b. Responsibility

The Supervisor-Radwaste Nuclear, in carrying out his responsibility for overall radwaste operations, is responsible for:

- NRC Packaging, DOT Packaging and Shipping Requirement Compliance.
- NRC and 10CFR20 Radioactive Material Storage Requirements through an interface with Radiological Control Department personnel.
- Insuring that appropriate management and administrative control systems and procedures are developed, implemented and complied with, as necessary, to fulfill the other listed responsibilities.

c. Authority

The Supervisor-Radwaste Nuclear has the authority to:

- Stop the shipment of any radioactive material which does not comply with regulatory or management requirements.

- Stop any activity which unnecessarily generates radioactive waste.

d. Minimum Qualifications

The Supervisor-Radwaste Nuclear shall possess as a minimum a Bachelor of Science Degree in an engineering or science discipline and four years of experience of which a minimum of two years shall be nuclear power plant experience. Four years of nuclear power plant experience may be substituted for the degree requirements.

e. Incumbent Includes:

Radwaste Supervisor 11-79 to Prensent

Superviser responsibility for the operation and technical support of the radwaste activities at Three Mile Island Unit 1 (800 MW net, PWR). Provide Supervision for a group consisting of one engineering associate, three foremen and eleven laborers, and having a yearly operating budget of over $750,000. The group is responsible for solidification, shipping and disposal of liquid and wet and dry solid radioactive waste produced in TMI-1, decontamination and cleaning of equipment cubicles and hallways in the Reactor and Auxilary Building, provision of technical support for radwaste process operations, coordination of TMI-1 improvements to radwaste systems operations, and supervision of contractor supplied processing and solidification services.

Directly involved in the engineering and design of a radwaste solidification system using the DOW binder to replace a urea formaldehyde system (PP1). Directly involved in modifications to upgrade the reliability of the plants radwaste evaporators.

Continued to provide technical support for problems involving liquid releases water and industrial waste treatment and hazardous and sanitary waste disposal.

Radwaste Engineer 4-76 to 11-79

Provided technical support for operations and project coordination for the improvement of systems dealing with radioactive waste treatment and disposal and water and non radioactive waste treatment for Three Mile Island Units 1 and 2. Coordinated the liquid processing capabilities of the two operating units. Started-up the TMI-2 waste evaporator and provided technical support (trouble shooting and procedure updating) for the operation of the two TMI-1 waste evaporators.

Provided technical support for a radwaste solidification system using urea Formaldehyde. Investigated the feasibility of installing radwaste volume reduction equipment at the plant. Directed projects to (1) further coordinate the radwaste treatment facilities of the two units by installing interconnecting piping, (2) provide a radwaste storage facility for solidified waste and dry trash, and (3) upgrade evaporator performance.

Provided chemical engineering services to upgrade water treatment systems and to start up the $1.5 million industrial waste water treatment system.

Following the TMI-2 accident, coordinated the installation of a portable liquid radwaste treatment system to use in lieu of the station's waste evaporator.

Environmental Engineer 6-73 to 4-76

Environmental Engineer

Involved in water pollution monitoring and control, air pollution monitoring and solid waste disposal as related to the generation of electricity at fossil fuel and nuclear power plants. Project management responsiblity including budgeting, installation, start-up, and continued operation of an eight station ambient air monitoring network. The network performs computer controlled realtime monitoring of air quality in the vicinity of coal burning power plants. Responsible for writing specifications and the evaluation of instrumentation to monitor the emission of sulfur dioxide and particulate matter. Responsible for the implementation of chemical and thermal monitoring programs in accordance with the requirements of the National Pollutant Discharge Elimination System (NPDES) permits issued to power plants. Familiar with analytical techniques for the analysis of waste water. Technical and management support for the design installation of a cooling tower and industrial waste treatment system.

Participated in the cooperative education at Drexel University 7/69 - 9/71.

Heico Inc., Delaware Water Gap, Pennsylvania Active in many aspects of chemical production including laboratory bench scale development of methods of producing new chemicals, quality control, and equipment maintenance. Experience culminated in an assignment as co-supervisor of the night production shift producing specialty inorganic and photographic chemicals.

Xerox Corporation, Webster, New York
Assisted in the development of a process to manufacture light sensitive blue dye for use in a toner for color copying.

f. Interfaces

In carrying out his supervisory responsibilities for Radwaste Operations the Supervisor-Radwaste Nuclear interfaces and communicates with:

- The Radiation Protection Supervisor for radiation and contamination surveys and radioisotope analysis to insure compliance with regulatory and management requirements.
- The Supervisor of Operations for systems operation and material control to minimize the volume of radioactive materials generated at TMI-1.
- The Training Department within the Nuclear Assurance Division for support in implementing adequate training programs for radwaste personnel.
- Interface with Radiation Protection and Operations personnel to insure that regulatory compliance is achieved and generation of radwaste is controlled.

5.2.6 Shift Supervisor

a. Function

The Shift Supervisor reports to the TMI-1 Supervisor of Operations. This position directs the activities on his shift and is cognizant of operations, maintenance, construction and radiologically controlled maintenance activities being performed while he is on duty. This function includes the approval and assurance that all activities involving Nuclear Safety related systems and components are accomplished in accordance with properly approved procedures.

b. Responsibility

The licensed Senior Reactor Operator assigned to the position of Shift Supervisor has the primary command and control responsibility for the management and direction of all operations and maintenance activities, including the manipulation of any controls, equipment, or components in physical plant systems for TMI-1 on his shift. The Shift Supervisor Command responsibilities are further defined in a management directive dated 11/28/79 signed by the acting Med-Ed President. Administrative functions that detract from his primary responsibility for safe operating of the plant are delegated

to other personnel. He is responsible for Technical Specification compliance regarding operations and maintenance activities occurring on his shift.

c. Authority

The Shift Supervisor has the authority and obligation to shut down the unit if, in his own judgment, conditions warrant this action. The Shift Supervisor also has the authority to refuse, or halt any activity, requested or in process, on any plant system if, in his judgment, the safety of plant systems, the public, or plant personnel are endangered.

d. Minimum Qualifications

Each Shift Supervisor shall have a high school diploma or an equivalent education. He shall have a minimum of 4 years power plant experience of which a minimum of one year will be nuclear power station operations or maintenance. A maximum of two years of academic or related education may be included as part of the remaining three years of required plant experience. Each Shift Supervisor must hold a Senior Reactor Operator's License.

e. Incumbent Qualifications

Incumbent A

Education:	High School Graduate - 1954
Military Service:	U.S. Army 1958-1959
Licenses:	RO License TMI-1 August 1974 SRO License TMI-1 December 1976
Relevant Assignments:	Control Room Operator - TMI-1 October 1969 - October 1976
	Shift Foreman - TMI-1 October 1976 - July 1979
	Shift Supervisor - TMI-1 July 1979 - Present

Incumbent B

Education:	High School Graduate - 1961
Licenses:	RO License TMI-1 August 1974 SRO License TMI-1 August 1976

Relevant Assignments:	Auxiliary Operator - TMI-1 October 1969 - December 1972
	Control Operator - TMI-1 December 1972 - July 1975
	Shift Foreman - TMI-1 July 1975 - July 1979
	Shift Supervisor - TMI-1 July 1979 - Present

Incumbent C

Education:	High School Graduate - 1959
Licenses:	RO License TMI-1 August 1974 SRO License TMI-1 October 1977
Military Service:	U.S. Air Force - 1959-1963
Relevant Assignments:	Control Room Operator - TMI-1 October 1968 - August 1976
	Shift Foreman - TMI-1 August 1976 - April 1978
	Shift Supervisor - TMI-1 April 1978 - Present

Incumbent D

Education:	High School Graduate - 1964
Licenses:	RO License TMI-1 August 1974 SRO License TMI-1 July 1975
Military Service:	U.S. Navy - 1966-1971
Relevant Assignments/ Training:	U.S. Navy Basic Nuclear Power School (26 weeks) 1966-1967
	Nuclear Power Prototype School (26 weeks) - 1967
	Reactor Operator - U.S. Navy - USS Bainbridge 1969-1971
	Auxiliary Operator - TMI-1 February 1972-October 1973

Shift Foreman - TMI-1
October 1973-May 1976

Shift Supervisor - TMI-1
May 1976-Present

Incumbent E

Education: High School Graduate - 1964

Licenses: RO License TMI-1 August 1974
SRO License TMI-1 August 1976

Military Service: U.S. Air Force - 1964-1969

Relevant Assignments: Auxiliary Operator - TMI-1
March 1969 - July 1970

Control Room Operator - TMI-1
July 1973 - October 1975

Shift Foreman - TMI-1
October 1975 - October 1977

Shift Supervisor - TMI-1
October 1977 - Present

Incumbent F

Education: High School Graduate - 1957

Licenses: RO License TMI-1 August 1974
SRO License TMI-1 September 1977

Military Service:

Relevant Assignments/
Training: Auxiliary Operator - TMI-1
October 1969 - July 1970

Control Room Operator - TMI-1
July 1970 - June 1977

Shift Foreman - TM -1
September 1977 - May 1980

Shift Supervisor - TMI-1
May 1980 - Present

f. Interfaces

1. Offsite

The Shift Supervisor has no offsite interfaces or responsibilities during normal operation. During abnormal or emergency situations, he is required to insure offsite notifications, specified in the Emergency Plan, are made in a timely manner.

5.2.7 Shift Foreman

a. Function

The Shift Forman reports directly to the Shift Supervisor. He directs the activities of the unit operators on his shift and is cognizant of all in plant activities being performed while he is on duty.

b. Responsibility

The Shift Foreman is responsible for the actual operation of the unit during his assigned shift. He is also responsible for insuring all control room activities including control panel monitoring, processing of RWP and tagging applications, operational log and recording functions, and interplant communications are executed in accordance with prescribed guidelines and correct operating practices. He is responsible for the orderliness, correctness and proper decorum of Control Room operations and related activities.

c. Authority

The Shift Foreman on duty has both authority and the obligation to shutdown the unit if, in his judgment, conditions warrant this action.

d. Minimum Qualifications

Each Shift Foreman shall have a high school diploma or an equivalent education. He shall have a minimum of 4 years power plant experience of which a minimum of one year will be nuclear power station operations or maintenance. A maximum of two years of academic or related education may be included as part of the remaining three years of required plant experience. The Shift Foreman must hold a Senior Reactor Operator's License, or hold a Reactor Operators License and have made significant progress toward completion of training for a Senior Reactor Operators License.

e. Incumbent Qualifications

Incumbent A

Education	High School Graduate - 1963
Licenses:	RO License TMI-1 May 1976 SRO License TMI-1 September 1978
Military Service:	U.S. Air Force - 1963-1968
Relevant Assignments:	Auxiliary Operator - TMI-1 July 1968 - June 1975
	Control Room Operator - TMI-1 June 1975 - July 1978
	Shift Foreman - TMI-1 July 1978 - Present

Incumbent B

Education:	High School Graduate - 1963
Licenses:	RO License TMI-1 May 1976 SRO License TMI-1 June 1978
Military Service:	U.S. Navy - 1963-1971
Relevant Assignments/ Training:	U.S. Navy Nuclear Power School - (26 weeks) 1964-1965
	Nuclear Power Prototype School - (26 weeks) - 1965
	Mechanical Operator - USS Whale - 1968
	Engine Room Supervisor - USS Theodore Roosevelt - 1969-1971
	Auxiliary Operator - TMI-1 February 1971 - April 1975
	Control Room Operator - TMI-1 April 1975 - May 1978
	Shift Foreman - TMI-1 May 1978 - Present

Incumbent C

Education:	High School Graduate - 1966
Licenses:	RO License TMI-1 September 1977 SRO License TMI-1 September 1978
Military Service:	U.S. Navy 1968-1974
Relevant Assignments/ Training:	U.S. Navy Nuclear Power School - (26 weeks) - 1968
	Nuclear Power Prototype School - (26 weeks) - 1968-1969
	USS Sea Devil - Electrical System Operator - 1969-1972
	USS Bates - Sound and Vibration Analysis - 1972-1974
	Auxiliary Operator - TMI-1 February 1974 - October 1976
	Control Room Operator - TMI-1 October 1976 - July 1978
	Shift Foreman - TMI-1 July 1978 - Present

Incumbent D

Education:	High School Graduate - 1967
Licenses:	RO License TMI-1 August 1978
Relevant Assignments:	Auxiliary Operator - TMI-1 September 1975 - October 1977
	Control Room Operator - TMI-1 October 1977 - August 1979
	Shift Foreman - TMI-1 August 1979 - Present

Incumbent E

Education:	High School Graduate - 1969
Licenses:	RO License TMI-1 July 1979 SRO License TMI-1 July 1980

Relevant Assignments:	U.S. Navy 1970-1976 Nuclear Power School and Nuclear Prototype School
	Auxiliary Operator - TMI-1 May 1976 - March 1978
	Control Room Operator - TMI-1 April 1978 - December 1979
	Shift Foreman - TMI-1 December 1979 - Present

Incumbent F

Education:	High School Graduate - 1962
Licenses:	RO License TMI-1 December 197 SRO License TMI-1 May 1978
Military Service:	U.S. Navy - 1963-1970 U.S. Navy Electronics School - 1963-1964
Relevant Assignments/ Training:	U.S. Navy Nuclear Power School - (26 weeks) - 1965
	Nuclear Power Prototype School - (26 weeks) - 1965-1966
	Reactor Operator - USS George C. Marshall - October 1968-March 1970
	Auxiliary Operator - TMI-1 June 1970 - February 1974
	Control Room Operator - TMI-1 February 1974 - February 1978
	Shift Foreman - TMI-1 March 1978 - Present

f. Interfaces

1. Offsite

The Shift Foreman has no offsite interfaces or responsibilities during normal operation. During abnormal or emergency situations, he may be delegated by the Shift Supervisor to assist in making the offsite notifications specified in the Emergency Plan.

5.2.8 Control Room Operator

a. Function

Each Control Room Operator reports to the Shift Foreman and operates the reactor, turbine, generator, switchboards and all other equipment required to operate the plant in a safe and reliable manner in accordance with the Operating License and approved procedures.

b. Responsibility

The Control Room Operator is responsible for all the operation of equipment assigned to him in the Unit, and the reporting of any unusual performance of this equipment to the Shift Foreman. He is responsible for the correct manipulation of plant controls from the Control Room in accordance with the provisions of his Reactor Operator (RO) license.

c. Authority

The Control Room Operator has the authority to shutdown the unit when conditions in the unit warrant such action. He also has the authority to direct the Auxiliary Operators in their performance of approved procedures and normal activities.

d. Minimum Qualifications

A Control Room Operator must have a High School diploma or equivalent and two years experience in a power plant one of which is at a nuclear plant. The Control Room Operator must be licensed by the NRC.

5.2.9 Auxiliary Operator

a. Function

The main function of each Auxiliary Operator is to operate and inspect equipment in the nuclear power station as required to support day-to-day operation from his position outside the Control Room. He will be directed in the performance of his duties by the Shift Foreman or the Control Room Operator and will report any unusual performance of equipment.

Auxilary Operators are considered to be in training for more responsible positions and eventual NRC licensing as Reactor Operators or Senior Reactor Operator when prerequisite requirements for such Licenses are fulfilled.

b. Responsibility

The Auxiliary Operator shall be responsible for the operation and inspection of plant equipment. He is responsible for notifying the appropriate supervisor if any portion of the unit exceeds established radiological control limits. He assists in the receipt, storage, loading and unloading of fuel, shipment of irradiated materials and disposal of radioactive wastes as directed.

c. Authority

The Auxiliary Operator shall have the authority to execute Company approved procedures as directed by Control Room Operators or Shift Foreman.

d. Minimum Qualifications

Each Auxiliary Operator should have a high school diploma or equivalent. The Auxiliary Operator shall exhibit mature judgement and testing will be used to aid in determining the individuals ability to progress to higher levels of responsibility and eventual NRC licensing.

5.2.10 Superintendent of Maintenance

a. Function

The Superintendent reports to the Manager and provides maintenance support for the unit.

b. Responsibility

This position is responsible for planning, organizing, integrating and directing the maintenance effort of TMI-1 in order to insure optimum equipment/systems availability and reliability.

This position is responsible for assuring the provision of adequate resources to carry out the maintenance programs though applications of the plant resources.

c. Authority

The Superintendent of Maintenance has the authority to assign maintenance work to company and contract resources identified by management.

d. Minimum Qualifications

This position shall have seven (7) years of responsible power plant experience or applicable industrial experience, a minimum

of one (1) year which shall be nuclear power plant experience. An Associate Degree in an Engineering or Scientific field is preferred and may be credited to the remaining six (6) years of experience. The individual should have non-destructive testing familiarity, craft knowledge and an understanding of electrical, pressure vessel and piping codes.

e. Incumbent Qualifications

The Superintendent of Maintenance is a Navy veteran of twenty-seven years who was responsible for the operation and maintenance of the ships main propulsion plant, auxiliary machinery, piping systems and for the operation and maintenance of electric power generation and distribution systems. He has served as Chief Engineer and Repair Officer on several large combatant naval ships. He was a member of the Naval Board of Inspection and Survey as an Engineering Inspector. He attended engineering service schools as a pre-requisite for qualification as Engineer Officer. In July of 1973, the incumbent became Supervisor of Maintenance for Three Mile Island Nuclear Station Unit No.1 where he directed the Instrument and Control, Mechanical, Electrical, and Utility Maintenance functions. He remained in this capacity until January 1977 when he assumed the position of Supervisor of Maintenance for Three Mile Island Nuclear Station Unit No. 2 In December 1977 the incumbent assumed the position of Superintendent of Maintenance where he was responsible for all maintenance functions on both Units No. 1 and No. 2. In November 1979 the units were split and a revamp made in organizational structure. At this time, the incumbent assumed the position Superintendent of Maintenance TMI-1 and is presently serving in the capacity.

f. Interfaces

Contractors, vendor representatives and with the Maintenance & Construction Division.

5.2.11 Supervisor - Corrective Maintenance

a. Function

The Supervisor reports to the Superintendent of Maintenance and provides corrective maintenance support for the TMI-1.

b. Responsibility

This position is responsible for planning, organizing, integrating and directing the corrective maintenance effort for Unit 1 in order to insure optimum equipment/systems availability and reliability.

This position is responsible for the identification, justification, and utilization of resources requisite to the maintenance program.

c. Authority

The Supervisor - Corrective Maintenance has the authority as delegated by the Superintendent - Maintenance to assign corrective maintenance tasks to company and contractor resources identified by management.

d. Minimum Qualifications

This position is required to have seven (7) years of responsible power plant experience or applicable industrial experience, a minimum of one (1) year which shall be nuclear power plant experience. An Associate Degree in an Engineering or Scientific field is preferred and may be credited to the remaining six (6) years of experience. The individual should have non-destructive testing familiarity, craft knowledge, and an understanding of electrical, pressure vessel and piping codes.

e. Incumbent Qualifications

Education:	University of Missouri BSME - 1968
Military Service:	U.S. Navy - 1968 - 1979
Relevant Assignments:	Training - U.S. Naval Nuclear Power School and Prototype Training 1968 - 1969
	Qualified for Supervision, Operation and Maintenance of Naval Nuclear Propulsion Plant as Engineering Officer of the Watch 1969 - 1979
	Qualified as Nuclear Engineer Officer 1973 - 1979
	Served on two (2) different nuclear submarines as Electrical Officer, Main Propulsion Assistant, Engineer Officer and Executive Officer - (2nd in command).
	Supervised equipment overhauls, reactor defueling, refueling, reactor startup and testing two nuclear submarine overhauls 1972 and 1976 as Senior Supervisory Watch.

TMI - Maintenance Engineer, April 1979 to Oct. 1979.
Special Maintenance Projects.
Supervised charcoal filter changeout.
TMI Unit 2 - April 1979 - June 1979.
Designed, implemented and maintained emergency air breathing system for TMI-2 Auxiliary Building, April 1979 - Sept. 1979.
Various other engineering projects associated with TMI-1

TMI - Supervision of Corrective Maintenance, Oct. 1979 to Present
Reduced Corrective Maintenance backlog from 2000 to 900 outstanding work requests.
Implemented detailed work planning and scheduling.

f. Interfaces

1. Offsite

Contractors, vendor representatives

5.2.12 Supervisor - Preventive Maintenance

a. Function

The Supervisor reports to the Superintendent of Maintenance and provides preventive maintenance support for the unit.

b. Responsibility

The Supervisor is responsible for organizing, modifying, and conducting the preventive maintenance for the Unit. The Supervisor - Preventive Maintenance has the responsibility to identify/justify resources requisite to accomplish the PM program.

c. Authority

The Supervisor - Preventive Maintenance has the authority as delegated by the Superintendent - Maintenance, to assign preventive maintenance tasks, not performed by the operations department, to company and contractor resources identified by management.

He has the authority to establish and/or modify the operation of the PM Program not required by Technical Specification Surveillance.

d. Minimum Qualifications

The Supervisor of Preventive Maintenance shall have seven (7) years of responsible power plant experience or applicable nuclear power plant experience. An Associate Degree is an Engineering or Scientific field is preferred and may be credited to the remaining six (6) years of experience. The individual should have non-destructive testing familiarity, craft knowledge, and an understanding of electrical, pressure vessel and piping codes.

e. Incumbent Qualifications

Education:	High School graduate - 1957
Relevent Assignments:	U.S. Navy (1958-1962) as Electronics Technician. Final rate: E-5. Was Lead Petty Officer last 1 1/2 years of enlistment.
	Saxton Nuclear Experimental Corp. Instrument Technician July 1966 to August 1972.
	TMI - Maintenance Foreman in Instrumentation August 1972 to November 1976 and June 1978 to December 1978.
	TMI-1 I&C Dept. Supervisor - Dec. 1978 to Nov. 1979
	TMI-1 Preventive Maintenance Supervisor, Nov. 1979 to Present
	Training - numerous training courses including at Penn State, a Management Development course, Electrical Theory course and Math course, and one (1) week of B&W simulator training.

f. Interfaces

1. Offsite

Contractors, Vendor representatives

5.2.13 Maintenance Foreman

a. Function

The Maintenance Foreman reports to the Supervisor of Preventive Maintenance and provides support in the area of their discipline.

b. Responsibility

Maintenance Foreman is responsible for directing the work of assigned personnel in the performance of preventive maintenance.

c. Authority

Assigns production personnel to tasks. Resolves departmental interface problems at production level.

d. Minimum Qualifications

Each Foreman shall have a high school diploma or equivalent and four (4) years of experience in the craft or discipline supervised and shall have supervisory skills necessary to coordinate the activities of a crew or crews consisting of technical and/or non-technical personnel in the performance of their functions.

5.2.14 Lead Maintenance Foreman (Mechanical, Electrical or I&C)

a. Function

Lead Maintenance Foreman reports to the Supervisor - Corrective Maintenance and directs the day to day activities of the department for which they are responsible.

b. Responsibility

The Lead Maintenance Foreman prioritize and assign the duties to be carried out by the Foremen who report to him.

c. Authority

Assigns tasks to Foremen and production personnel.

d. Minimum Qualifications

Each Foreman shall have a high school diploma or equivalent and four (4) years of experience in the craft or discipline supervised and shall have supervisory skills necessary to coordinate the activities of a crew or crews consisting of technical and/or non-technical personnel in the performance of their function.

5.2.15 Manager Plant Engineering

a. Function

The Manager Plant Engineering reports to the Vice President - TMI and is responsible for the coordination of the technical engineering staff including the Nuclear Engineering, Mechanical

Engineering, Electrical Engineering, Instrument and Control Engineering, Fire Protection Program and Chemistry.

b. Responsibility

This position is responsible for providing the technical engineering support for TMI-1 in order to ensure safe and efficient operation. The incumbent ensures overall safety of TMI-1 Operations through the review and evaluation of changes to procedures, systems and equipment in their relationship to Licensing and designs basis criteria contained in Licensing Base Documents. This position is responsible for the effective direction of lead engineers and their functional areas, ensuring that technical support is provided in decisions involving all aspects of the Unit's operation, scheduling and coordination of all aspects involved with and during plant refueling, supervising budget preparation and controlling expenditures to conform to the unit budget and effectively assists in the coordination of communications between TMI and the Technical Functions Division. This position is also responsible for the establishment and implementation of the Plant Chemistry Program and the Fire Protection Program.

c. Authority

The Manager has the authority to approve design and modification work within the limits defined by Technical Specifications and Technical Functions requirements. He has the authority to approve Purchase Requisitions for material, equipment, supplies and services in the Engineering and Chemistry Area at TMI. He has the authority to recommend procedure changes to the IOSRC. Additionally, he shall provide engineering support for the Maintenance and Operations Departments.

d. Minimum Qualifications

The Manager shall have a Bachelors Degree in Engineering or a Scientific field and at least 8 years in responsible positions related to power generation, of which, 3 years shall be nuclear power plant experience. The individual should have non-destructive testing familiarity, craft knowledge,and an understanding of electrical, pressure vessel and piping codes.

e. Incumbent Qualifications

Obtained a B.S. Mechanical Engineering from Villanova University in 1963. Formal training related to the nuclear field since graduation include a one-month course in Reactor Engineering at the Universtiy of Michigan, a two-week course in Health Physics at the University of Michigan, a two-month course in PWR technology at the Babcock & Wilcox Co. and simulator training at B&W.

Joined Metropolitan Edison Co. in 1963 as a Cadet Engineer in the Reading Office. Worked in the Generation Department for

approximately two years on technical problems associated with the fossil stations. Approximately two years (1965-1967), were spent at the Crawford Generation Station. One year was spent as the Plant Engineer responsible for preparation of all of the technical reports and technical problems at the station. The I&C Department and Chemistry Department were also under the direction of the Plant Engineer. The other year was spent as the Mechanical Maintenance Foreman responsible for the scheduling of all mechanical plant maintenance as well as the supervision of the plant maintenance force. Major work assignments were associated with turbine and boiler overhauls.

In 1967 he was sent to Saxton Nuclear Station. He spent approximately 1 1/4 years there mainly training in the overall operation and maintenance of a nuclear station. He obtained a NRC Operator License while he was there.

In 1968 he was assigned to TMI as the Supervisor of Operations. He was involved with the initial selection and training of operating personnel. The biggest effort was in the preparation of Plant Operating Procedures and supporting the Startup and Test Program. In 1973 he became the Plant Engineer responsible for all Mechanical, Electrical, Nuclear and I&C Engineering on TMI-1. In August of 1974 he became TMI-1 Unit Superintendent responsible for the operation and maintenance of TMI-1. He also had reporting to him the Plant Engineer and the Supervisor of Health Physics/Chemistry. He also obtained a NRC, SRO License on TMI-1.

In May of 1977, he was transferred to the Reading Generation Department as Director of Projects. Some of the major areas of responsibility were the Industrial Waste Plants at the fossil units, backfit of a fossil unit with a cooling tower and the installation of the TMI Security System.

In April of 1979 he was sent to TMI to assist in the post-accident activities. He was initially involved with assisting in obtaining the necessary manpower, as required and served for approximately 5 months as the senior on-site representative on the back shift for Unit 2 activities. He has been filling the position of Manager-Plant Engineering (TMI-1) since the latter part of 1979.

f. Interface

1. Offsite

The Manager will primarily interface with the Technical Functions Division in areas requiring specialized engineering assistance which cannot be performed by the onsite staff. He will interface with Materials Management on procurement/contract problems. He will interface with regulatory bodies, such as the NRC on technical areas involved with the Technical Specifications.

2. Other TMI Staff

Supervisor Maintenance	- Technical assistance when required - Coordination of work - Allocation of resources - Feedback on program effectiveness
Supervisor - Operations	- Technical assistance when required - Scheduling of work
Manager Unit 1	- Program technical support/evaluations

5.2.16 Lead Nuclear Engineer

a. Function

The Lead Nuclear Engineer functions to provide technical assistance to the Plant Operations and Maintenance Departments as directed by the Manager Plant Engineering.

b. Responsibility

This position is responsible for the support of plant operations activities related to nuclear physics testing to verify core design parameters, and the evaluation and interpretation of periodic surveillances related to the reactor core, including the review of safety-related operating, test and maintenance procedures and procedure changes.

The Lead Nuclear Engineer also has the responsibility for the direct supervision of physics testing, and the evaluation of nuclear parameters to insure they are within the bounds permitted by the Technical Specifications.

Areas of Plant Operations and Maintenance Activity Technical Support include such areas as maintaining Special Nuclear Material Inventory Records required by 10 CFR 70 and the coordination of all nuclear fuel movements, including fuel receipt.

c. Authority

The Lead Nuclear Engineer has the authority to coordinate activities which involve handling of fuel assemblies according to approved procedures. He has the authority to supervise and make the initial determination regarding the acceptability of testing involving nuclear fuel and related fuel handling equipment.

He has the authority to recommend procedure changes and design changes, and may perform the initial nuclear safety evaluation on design and procedure changes.

d. Minimum Qualifications

The Lead Nuclear Engineer shall meet the minimum qualification requirements of ANSI/ANS 3.1-1978.

e. Incumbent Qualifications

September 1976 - December 1976: Met-Ed Corporate

Nuclear Engineering and Plant Performance

Engineer I- Nuclear

. Development of performance testing for TMI-1.

January 1977 - December 1978: Met-Ed Corporate

Nuclear Fuels Group

Engineer I Nuclear

. Performance and evaluation of TMI-1. Physics Testing.

. Cycle Reload evaluation and Licensing.

. Review NSSS Safety Analyses.

. Completed accident analyses for fuel handling accidents and high OTSG Inventory startups.

. Revieved and evaluated B&W NSSS on-line computer calculations.

. Performed evaluation of Incore Detector System.

. Supported TMI-1 fuel shuffle.

January 1979 - Present: Met-Ed TMI

Nuclear Engineering

Engineer II Nuclear

. Supervision of fuel handling.

. Procedural Preparation for Physics Testing.

- Reactor Follow on Core Power Distribution and Reactivity Depletion
- Revision to Operational Procedures to reflect Cycle Physics
- Offsite Radiological Dose Assessment
- Emergency Procedure review and update
- Nuclear fuel inspection and evaluation

f. Interfaces

The Lead Nuclear Engineer reports to the Manager Plant Engineering. In performing his duties, the Lead Nuclear Engineer interfaces with other Lead Engineers, the Independent Onsite Safety Review Committee, offsite engineering support, Nuclear Regulatory Commission Inspectors and Maintenance, Operations and Radiological Control Department personnel.

5.2.17 Lead Electrical Engineer

a. Function

The Lead Electrical Engineer functions to provide technical assistance to the Plant Operations and Maintenance Departments as directed by the Manager-Plant Engineering.

b. Responsibility

This position is responsible for the support of plant operations and maintenance activities relating to electrical systems and components, including the review of safety-related operating, test, maintenance procedures and procedure changes.

Areas of Plant Operations and Maintenance Technical Support activities include such components and systems as Control Rod Drive, Pressurizer Heater Control, Engineering Safeguards Actuation, Diesel Generators, Main and Auxiliary Transformers, Heat Trace, Main Generator Temperature Monitoring, Electrical Distribution, Grounding and Lightning Protection, Battery and Battery chargers, Inverters and Vital Busses, and Substation equipment.

c. Authority

The Lead Electrical Engineer has the authority to recommend procedure changes and design changes. He also has the authority to perform the initial nuclear safety evaluation on design and procedure changes.

d. Minimum Qualifi ations

The Lead Electrical Engineer shall meet the minimum qualification requirements of ANSI/ANS 3.1-1978.

e. Incumbent Qualifications

Education:

Pennsylvania State University
Dubois Campus
Associate Degree - Electrical
1963 - 1965

Pennsylvania State University
Capitol Campus
Bachelor of Engineering Technology -
Electrical 1968 - 1970

Relevant Assignments:

Summer Student - Engineering Assistant - TMI-1
June 1969 - September 1969

Duties during this period were:

a. Review of Electrical Elementaries and Logic Diagrams for TMI-1

b. Preparing draft Operating and Te.t Procedures for TMI-1

c. Preparation of a Composite Liquid Waste System Flow Diagram for TMI-1

Project Engineer - TMI-1 June 1970 to November 1973

Duties as Project Engineer were:

a. Review of Procurement Specifications and Vendor Proposal and witness of Factory Tests for the Control Rod Drive System, Under Water Television System and Borescope.

b. Preparation and/or review of Operating, Maintenance, and Startup Test Procedures for TMI-1

Lead Electrical Engineer TMI-1 November 1973 to Present

As Lead Electrical Engineer, the incumbent is responsible to provide technical assistance to Operations and Maintenance Departments on the following systems:

a. Control Rod Drive

b. Emergency Diesel Generator

c. Electrical Distribution

d. Inverters

e. DC Storage Batteries, Chargers, and Distribution System

f. Grounding and Lightning Protection

g. Electrical Motors

n. Heat Trace

From 1972 through 1975, the incumbent provided training to Operators and Maintenance personnel on several systems. This function included preparation of the lecture notes and presentation of the course.

From 1974 through present the incumbent was responsible for initiating and performing the safety evaluation on change modifications on various systems.

The incumbent has served as a member (6 years) of the Plant Operation Review Committee, including Vice-Chairman (2 years) and Chairman duties (6 months).

Licenses: The incumbent held a Senior Reactor Operators License for one year (1979) SOP 3395 and is a registered Professional Engineer in the State of Pennsylvania.

f. Interface

The Lead Engineer reports to the Manager Plant Engineering. In performing his duties, the Lead Electrical Engineer interfaces with the other Lead Engineers, the Independent Onsite Safety Review Committee, Offsite Engineering Support, Nuclear Regulatory Commission Inspectors, and Maintenance, Operations and Radiological Control Department personnel.

5.2.18 Lead Instrument and Control Engineer

a. Function

The Lead Instrument and Control Engineer functions to provide technical assistance to the Plant Operations and Maintenance Departments as directed by the Manager Plant Engineering.

b. Responsibility

This position is responsible for the support of TMI-1 operations and maintenance activities relating to Instrument and Control Systems and components, including the review of safety-related operating, test and maintenance procedures and procedure changes.

Areas of Plant Operations and Maintenance Activity Technical Support include such components and systems as the Reactor Protection System, Integrated Control System, Non-Nuclear Instrumentation, Incore Monitoring System, Loose Parts Monitoring System, Pneumatic Control Valves and Components, and the Turbine Electro-Hydraulic Control System.

c. Authority

The Lead Instrument and Control Engineer has the authority to recommend procedure changes and design changes. He also has the authority to perform the initial nuclear safety evaluation on design and procedure changes.

d. Minimum Qualifications

The Lead I&C Engineer shall meet the minimum qualification requirements of ANSI/ANS 3.1-1978.

e. Incumbent Qualifications

Military Information:

Branch -	Navy
Service Dates -	June 1968 - June 1973
Rank at Discharge -	Lieutenant
Duty Station -	U.S. Atomic Energy Commission Division of Naval Reactors Washington, D.C. 20545 (Naval Ship Systems Command, Code 08K)
Security Clearance -	U.S. Atomic Energy Commission "Q" (SECRET RESTRICTED DATA)

College Education:

a. Dates - September 1966 - June 1968
School - University of South Carolina
Columbia, South Carolina
Degree - Master of Electrical Engineering
(Automatic Control Systems)

b. Dates - September 1961 - June 1966
School - University of Louisville
Louisville, Kentucky
Degree - Bachelor of Electrical
Engineering

Special Schools:

a. Dates - January 1969 - June 1969
School - Bettis Reactor Engineering School
Course - 586 classroom hours of graduate level courses in pressurized water reactor theory and design. Naval Reactors training program conducted by employees of Westinghouse Bettis Atomic Power Laboratory, Pittsburgh, Pa

Employment Experience:

a. Dates - June 74 to present
Job Description - Three Mile Island Unit 1 Lead I&C Engineer

b. Dates - Dec. 63 to June 74
Job Description - Virginia Reasearch Inc., Falls Church, Va. Contract work for U.S. Navy. Evaluation of instruments and controls for conventional Naval Ships propulsion plants.

c. Dates - June 1968 to June 1973
Job Description - On the staff of Vice Admiral H. G. Rickover, US A.E.C. Headquarters, Washington, D.C., serving as a Nuclear Propulsion Engineer. Responsible for reactor instrumentation and control systems for five classes of nuclear powered submarines (8 ships). Primary duty directing and coordinating technical efforts of prime contractors, shipyards and forces afloat in the design, procurement, installation, testing, maintenance and operation of reactor control equipment.

d. Dates - June 1967 to Sept. 1967
Job Description - The Boeing Company, Huntsville, Alabama. Summer work between school terms. Analysis, using computer simulation, of flight dynamics of the Saturn V Launch Vehicle.

e. Dates - June 1966 - Sept. 1966 and
Dec. 1964 - March 1965
Job Discription - West Virginia Pulp and Paper Company. Summer work and school co-op program. Instrumentation and control of paper machine.

f. Dates - December 1963 to April 1964
Job Discription - Louisiville and Nashville Railroad. School co-op program. Design of Railroad Signal System.

f. Interfaces

The Lead Instrument and Control Engineer reports to the Manager Plant Engineering. In performing his duties, the Lead I&C Engineer interfaces with other Lead Engineers, the independent Onsite Safety Review Committee, offsite engineering support, Nuclear Regulatory Commission Inspectors and Maintenance, Operations and Radiological Controls Department personnel.

5.2.19 Lead Mechanical Engineer

a. Function

The Lead Mechanical Engineer functions to provide technical assistance to the Plant Operations and Maintenace Departments as directed by the Manager - Plant Engineering.

b. Responsibility

This position is responsible for the support of Plant Operations and Maintenance activities relating to mechanical systems and components, including the review of safety-related operating test and maintenance procedures and procedure changes.

Areas of Plant Operations and Maintenance Activities Technical Support include such components and systems as Steam Generators, Reactor Coolant Pumps, pipe hangers, supports and snubbers,

heat exchangers and coolers, Reactor Building structural integrity, Reactor Building containment isolation valve leak tightness, Emergency Diesels, ventilation systems, piping systems, pumps, valves, and filters.

c. Authority

The Lead Mechanical Engineer has the authority to recommend procedure changes and design changes. He also has the authority to perform the initial nuclear safety evaluation on design and procedure changes.

d. Minimum Qualifications

The Lead Mechanical Engineer shall meet the minimum qualification requirements of ANSI/ANS 3.1-1978.

e. Incumbent Qualifications

Education:	Pennsylvania State University BS Chemistry (included courses in Physics and Nuclear Physics).
Military Service:	U.S. Navy 1969 - 1974

e. Incumbent Qualifications

Relevant Assignments/Training:	U.S. Naval Nuclear Power School and Prototype Training - 1969 - 1970. This training included a 6 month classroom graduate level course of instruction in Reactor Plant Engineering, and 6 months of systems and practical operation training at an operating Naval Nuclear Reactor Prototype Plant. Qualified for Supervision of Operations and Maintenance of Naval Nuclear Propulsion Plant 1970 - 1974 Assigned to duty as Naval Officer aboard an operating nuclear Fleet Ballistic Missile submarine for over 3 1/2 years during shipyard overhaul, demonstration and shakedown, and fleet operations. Duties included: over 2 years served as Main Propulsion Assistant (Mechanical Machinery Division Officer); 1 year as Damage Control Assistant (Auxilary Mechanical Division Officer); and 1/2 year as Reactor Controls Division Officer.

Throughout the period, duties included direct supervision of nuclear plant operations and maintenance as Engineering Officer of the Watch/Duty Officer.

Two years experience as TMI-1 Operations Department Engineer during first two years commercial operation of Unit and first refueling outage. Duties included providing technical support and engineering assistance to the Supervisor of Operations.

Over three years experience as TMI-1 Lead Mechanical Engineer during commercial operation of Unit, including three refueling outages. Duties are as described in Paragraphs b and c above.

f. Interface

The Lead Mechanical Engineer reports to the Manager - Plant Engineering. In performing his duties, the Lead Mechanical Engineer interfaces with other lead engineers, the Independent Onsite Safety Review Committee, Off site Engineering Support, Nuclear Regulatory Commission Inspectors and Maintenance.

5.2.20 Supervisor Chemistry

a. Function

The Supervisor of Chemistry reports to the Manager Plant Engineering. The Supervisor Chemistry functions to implement and support the total plant Chemistry Program, which involves Laboratory Chemical Analysis, Primary and Secondary System Chemistry Control, Water Treatment, Waste Treatment and Radiochemistry to ensure safe, reliable plant operations which meet the requirements of State and Federal regulatory agencies.

b. Responsibility

The Chemistry Supervisor, in carrying out his responsibility for overall direction of the day-to-day TMI-1 Chemistry Program, is responsible for:

1. Proper operation and calibration of all chemical and radiochemical analytical and counting instruments.

2. Selection, set-up and calibration of new laboratory equipment necessary to maintain quality laboratory analysis concurrent with systems and discharge limitations.

3. Selection and development of chemical and radiochemical analytical procedures.

4. Insuring through appropriate analysis compliance with Chemical Sections of Plant Technical Specifications, Manufacturers Specifications and Discharge Permits.

5. Preparation and/or review of operating Plant Chemistry Procedure requirements.

6. Providing technical supervision and assistance for the operation of the Water Treatment Systems, Chemical Addition Systems and Waste Treatment Facilities.

7. Maintaining adequate chemistry records and preparing any necessary reports to various State and Federal agencies.

8. Providing technical guidance for the selection, setup calibration and operation of on-line chemical analyzers.

c. Authority

The Chemistry Supervisor has the authority to specify required chemical additions to plant systems based on analysis and required chemistry parameter limits.

d. Minimum Qualifications

The Chemistry Supervisor shall meet or exceed the minimum qualifications specified in ANSI/ANS 3.1-1978.

e. Incumbent Qualifications

7/68 to 8/72 - Radiochemist at Saxton Nuclear Experimental Corporation. Total responsibility for plant chemistry and radiochemistry analyses for compliance with Tech Specs, Vendor Specs and Industrial Waste Permit Specs. Provided Chemistry Training and Radiochemistry Training to Plant Operators, and Westinghouse customers who were sent to Saxton for such training.

8/72 to 4/74 - Chemist at TMI-1 (Unit 1). Responsible, along with Chemistry Supervisor, for Plant Chemistry and radiochemistry program. This included training and supervision of Technicians, procedures (writing, selection and review), equipment selection and set-up etc.

4/74 to 12/79 - Chemistry Foreman at TMI (Unit 1) - Same as above with more emphasis on laboratory supervision. Intimately involved with Startup of

TMI-1 from the startup of individual systems; such as, the pretreatment, cycle makeup demineralizers and Powdex through hot functional testing and commercial operation.

1/80 to Present - Supervisor Chemistry at TMI (Unit 1) - Responsible for selection of qualified personnel for positions reporting to him the overall training of these personnel. Also responsible for the function of technical liaison on chemistry and radiochemistry related matters.

Total Years Nuclear Experience - 12

f. Interfaces

The Chemistry Supervisor reports to the Manager-Plant Engineering. In performing his duties, he interfaces with Engineers, the Independent Onsite Review Committee, GPU System Laboratory Chemists, Nuclear Regulatory Commission Inspectors and Maintenance, Operations and Radiological Control Department personnel.

5.2.21 Technical Analyst - Fire Protection

a. Function

The Technical Analyst - Fire Protection reports to the Manager Plant Engineering. The Technical Analyst - Fire Protection functions to coordinate the implementation of the Fire Protection Program at TMI-1.

b. Responsibility/Authority

The Technical Analyst - Fire Protection is responsible for the overall readiness of all Fire Service and Fire Protection systems at Three Mile Island. The position is further responsible for evaluating related station fire protection activities to ensure satisfactory fire protection/prevention practices and conformance to required codes. This responsibility includes frequent station inspection, operation and maintenance (both corrective and preventative) assistance, and fire protection procedure review and development. This position is responsible for coordinating, developing and assisting the Training Department in the implementation of training programs for the Station's fire brigades and local fire companies.

c. Authority

The Technical Analyst - Fire Protection has the authority to make recommendations to improve the overall station Fire

Protection Program, including the areas of training, fire prevention, fire system and component material readiness and Technical Specification compliance.

d. Minimum Qualifications

The Technical Analyst - Fire Protection shall have a high school diploma or equivalent and shall have at least one year of practical experience in the fire protection field.

e. Incumbent Qualifications

Education:	High School Graduate - 1966 Completed 47 credit hours in Fire Service. Presently enrolled at Harrisburg Area Community College.
Military Service:	U. S. Navy 1968 - 1977
Relevant Assignments/Training:	Navy Nuclear Power School (26 weeks) - 1969 U. S. Navy Nuclear Prototype Instructor - 1970 - 1973 Quality Control Assistant - TMI - 1977 - 1978 Technical Analyst Fire Protection - 1979 - Present
Working Experience:	Total eleven years experience in the nuclear power industry (9 years in the Naval program), including four steam plant overhauls, three naval reactor refuelings, three TMI refuelings, and one naval new construction program. S3G Navy Prototype instruction duty (3 years) in maintenance, mechanical operation, chemistry, and radiation protection areas, including section supervision. M-Division Leading Petty Officer on two 637 class fast attack submarines, Leading ECT on three. 1.8 years in present fire protection position, which has included responsibilities for developing and improving the station's program. 3 years involvement with the company's position in fire protection area.

Previous work experience as Quality Control Assistant with ANSI qualifications as:
Level II Mechanical
Level II Electrical
Level II Receipt Inspection
Level I Operations
These qualifications were held for TMI-1 and 2 1977 to 1978.

Completion of approximately 300 company provided self study lesson plans.

f. Interfaces:

The position is accountable to the TMI-1 Manager-Plant Engineering for TMI-1 activities and to the TMI-2 Manager-Plant Engineering for TMI-2 activities. Interfaces with this position are established by Plant Administrative Procedures with the other engineering disciplines, the Fire Protection Engineers with the architect engineering firms, and the Company's Fire Protection Program Coordinator (Technical Support Functions Group). The position also interfaces with the Licensing Department on regulatory issues, and with the Insurance and Claims Department on issues involving the insurance carriers. To accomplish the remainder of the job functions, the position interfaces with the Fire Brigade Training Coordinator (Training Department) and personnel within Operations, QA, Utility, Maintenance, Stores, and Safety Departments. The position interfaces with the Emergency Planning Coordinator when dealing with local fires and ambulance personnel.

5.2.22 Shift Technical Advisor

a. Function

The Shift Technical Advisor will provide direct technical oversight of plant performance and safety and provide advise to the Shift Supervisor in these matters. In the event of a disagreement with the Shift Supervisor regarding a technical safety matter the STA will promptly notify his immediate supervisor for resolution.

b. Responsibility

The Shift Technical Advisor is responsible for providing on Shift* technical support to the Shift Supervisor in the accident and operating experience assessment functions. The Shift Technical Advisor also has the responsibility for:

- Monitoring the readiness of engineered-safety features to perform their design function, including the evaluation of the need for and initiation of corrective action on such components and systems.

- Advising the Shift Supervisor of any condition that may compromise the performance of Safety Systems or components in the event of an emergency.

- Providing technical liaison with the Plant Engineering Department regarding matters pertaining to Nuclear Safety.

- Providing technical advice to the Shift Supervisor during plant transients, abnormal events and emergencies.

c. Authority

The Shift Technical Advisor acts in a monitoring/advisory capacity to the Operations Shift Supervisor and Shift Foreman. He will advise and assist the Shift Supervisor in matters of reactor safety. He will also advise the Shift Supervisor whenever he believes it necessary to call for outside technical support.

d. Minimum Qualifications

The Shift Technical Advisor shall have a Bachelor of Science Degree in an Engineering or Scientific related field and a minimum of two years of related experience in power generation. In addition to the academic education, the Shift Advisor shall possess a thorough knowledge of plant systems and components. In addition, it is intended that the Shift Technical Advisor obtain the training necessary to be licensed as an SRO on as soon as practicable basis, but need not be licensed.

* Shift support means either "on shift" assignment or presence on site and available in the control room within ten minutes.

e. Incumbent Qualifications

Incumbent A

Education: University of Missouri - B.S. Mechanical Engineering - 1972.
Experience:
Metropolitan Edison Company/General Public Utilities

TMI-1 Restart - Reading 6/79 - 8/79

TMI-2 Accident Support - TMI-2 4/79 - 5/79
Write, review, and approve shutdown and support procedures. Review modifications, tie-ins, and operating procedures.

Performance Engineer - Reading 12/78 - 3/79
Evaluate performance problems and recommend solutions. Write and run condenser performance tests on TMI 1 and 2.

Shift Test Engineer (STE) - TMI-2 2/77 - 12/78
Power Escalation, Zero Power Physics, Post Fuel Load Pre-critical, Hot Functional, and Hydrostatic Testing. Provided shift coverage as qualified STE for above major tests. Directed plant operation and support test personnel, coordinated test sequence and conditions, and directed craft personnel during testing.

Functional Testing: Assisting in running tests on the following systems: Secondary River Water Cooling, Nuclear River Water Cooling, Pretreatment, Demineralized Water, Condensate Polishing, Condensate Feedwater, Emergency Feedwater, Vacuum, Circulating Water, Reactor Building Normal and Emergency Cooling, Fuel Handling Building and Auxiliary Building Heating and Ventilation, Reactor Building Hydrogen Control, Reactor Building Purge, Makeup and Purification, Decay Heat Removal, Reactor Building Spray, Core Flood, Diesel Generators, Engineered Safeguards, Waste Disposal, Instrument and Service Air, Nuclear and Decay Heat Closed Cooling, and Sump Systems.

Training Coordinator/STE in Training - TMI-2 (1/76 - 1/77)
Set up and execute training program for GPU Startup Group. Planned, scheduled, kept records, wrote lesson plans, and lectured for classes to qualify test personnel. Wrote functional tests, operating procedures, and alarm responses for plant systems while in training. Attended water treatment seminar and assisted in starting up Pretreatment, Demineralized Water, and Condensate Polishing Systems.

General Electric Company/Installation and Service Engineering
Field Engineer - Cooper Nuclear Station 1/75 - 12/75
Responsible for startup of Liquid Radwaste Systems. Provide technical direction to install G.E. systems. Startup: System flushing, initial running of system, writing test procedures,

and planning test schedule. Tech. Direction: Coordinate between site Engineering and G.E. Engineering. Solve technical problems arising from interferences, misinterpretation of design, and modifications.
Trainer: Supervise three Field Engineers in Training.

Field Engineer Cooper Nuclear Station 8/74 - 11/74
Provide technical assistance to plant engineering staff. Systems worked on included: Radiation Monitoring, Standby Gas Treatment, and Off Gas.

Field Engineer Cooper Nuclear Station 2/73 - 7/74
Test Engineer on Nuclear Boiler System. Wrote and ran pre-operational test on N.B. System. Ran or assisted in running of preoperational tests on the Off Gas Monitoring, Core Spray, Residual Heat Removal, Control Rod Drive Hydraulic, and Refueling Platform. Provided shift coverage during Startup Testing as Startup Engineer. Wrote operating or surveillance procedures for Service Water, Standby Gas Treatment, and Circulating Water Systems.

Field Engineer in Training McPherson, Kansas 1/73 - 2/73
Coordinate activities associated with installation of MS 7000 gas turbine.

Field Engineer in Training Kansas City, Missouri 11/72 - 12/72
Coordinate activities associated with major repair of MS7000 gas turbine.

Field Engineer in Training Schnectedy, N.Y. 6/72 - 11/72
Attended G.E. Field Engineer School and field assignments related with the school.

Incumbent B

Education:	1964-1968	Columbia High School - Diploma Columbia, South Carolina
	1968-1969 1973-1976	North Carolina State University - BS Nuclear Eng. Raleigh, North Carolina
	1970	Stock Control & Accounting Specialist (26B30) Fort Lee, Virginia
	1971-1973	Radar Repair Specialist (26B30) School Ft. Mammouth, New Jersey (Corres.)
Experience:	1970-1972	HP Technician at Westinghouse NFD in Columbia, South Carolina. Duties included performing airborne &

contamination surveys, calculating personnel exposures, collecting environmental samples, and surveying incoming and outgoing shipments of radioactive materials.

1970-1976 Radar repair specialist in SCARNG, Columbia, South Carolina. Duties included repair of radar and field radio sets, and calibration of diagnostic equipment (oscilloscopes, signal generators, multimeters, etc.)

1973-1976 Service Representative for 3M Business Products dealer in Raleigh, North Carolina. Duties include repair and reconditioning of business machines (copiers, overhead projectors, background music equipment, slide projectors, microfilm equipment, etc.)

1977-Present Nuclear Engineer for Metropolitan Edison Company. Assigned to the corporate suppport staff QA engineering section for 2 1/2 years. Duties included auditing (qualified to ANSI N45.223 as a Lead Auditor), review of engineering evaluations, development of a computerized system for tracking audit findings and creating a data base for trend analysis, and revising the QA plan. In addition, participated in 2 refueling outages (TMI-1) and TMI-2 startup activities as a member of the plant nuclear engineering staff on loan from QA engineering. Duties included overseeing fuel movement and physics testing on shift, divising a core shuffle sequence, procedure review and revision, and writing special operating procedures (installation of rod assembly retainers during TMI-2 startup). STA for the past 10 months. Activities are primarily related to training and watching special evolutions for problems.

Note: EIT 9/8/77
Associate Member ANS
Member Delaware Valley Section ANS

Incumbent C

Education: High School Graduate - Central Catholic H.S.
Reading, PA 1972

Bachelor of Science Degree - Albright College
(Mechanical Engineering) Reading, PA 1977

Master of Science Degree - University of Penn.
(Physics) Philadelphia, PA 1976

Licensing Engineer - Metropolitan Edison Co.
Reading Office
Generation Engineer I 1976
Generation Engineer II 1979

Developed, prepared and submitted application for NPDES and Water Quality Management Permits for Three Mile Island Nuclear Station.

Developed Spill Prevention Control and Containment Plan and Pollution Incident Prevention Plan for Three Mile Island Nuclear Station.

Prepared and submitted periodic reports and non-compliance reports for Three Mile Island Nuclear Station.

Participated in the Certification of Boilers and Pressure Vessels in accordance with the requirements of the ASME codes for Three Mile Island Nuclear Station.

Participated in management audit of the Met-Ed OQA Plan.

Developed, prepared and submitted:

- Tech Spec Change Requests (including safety analysis)
- FSAR Ammendments
- Responses to IE Bulletins and Circulars
- Responses to NRC letters of concern in specific areas such as:

1. Asymmetric LOCA loading
2. Environmental Qualification of Safety components
3. Small Break LOCA
4. Performance of ES components during under-voltage conditions

Following the accident at Three Mile Island Unit 2:

Provided Technical Support for Met-Ed Press Information Center at Hershey, Pa.

Participated in Met-Ed onsite Licensing Activities for Three Mile Island Unit 2 for the following areas:

- Unit 2 Recovery Mode Tech Specs (Safety and Environmental Portions)
- Status/Progress reports concerning the development of additional safety systems being constructed at TMI-2.

Shift Technical Advisor II: 9/79 to Present

Began training in plant systems, plant response to Transients, etc. as required by the STA training program

Particiapte in development, review and implementation of procedures for various one time plant evolutions

Provide technical training for on shift operations personnel

Monitor plant conditions, especially those relating to the status and operability of ES components

Incumbent D

Education: High School Graduate - Waynesboro Area Senior H.S. Waynesboro, PA 1972

Bachelor of Science, Nuclear Engineering - Rensselare Poyytechnic Institute, Troy, NY 1976

Master of Engineering, Nuclear Engineering - Pennsylvania State University, University Park, PA 1979

Course work for BS & ME included operation of RPI & PSU Reactors and Probabilistic Safety Analysis

Experience: Metropolitan Edison Company - 6/1/78 to Present

6/1/78 - 9/14/79: Engineer I - Generation. Licensing engineer based at Met-Ed corporate headquarters in Reading, PA. Prior to March 28, 1979 incident at TMI-2, duties consisted primarly of preparation of correspondence and reports for NRC I&E Bulletins & Circulars, TMI-1 Licenses Event Reports, and TMI-1 Technical Specification Change Requests. After March 28, 1979, became part of one site TMI Licensing group (Starting April 7, 1979).

Temporarily assigned (July 14, 1979 - August 17, 1979) as one of 4 operations Watch Coordinators in a 4 shift rotation. Duties consisted chiefly of hourly collection and trending of pertinent TMI-2 Data (i.e., plant pressures, temperatures, radiation emissions) and preparation of a status report distributed once per 8 hour shift to Met-Ed management, NRC, and others.

9/17/79 - 5/31/80: Shift Technical Advisor I at TMI-1
6/1/80 - Present: Shift Technical Advisor II at TMI-1

Miscellaneous:
Received Pennsylvania Engineer-In-Training Certificate, March 1978.

Incumbent E

Education: 6/67 - Graduated High School
Eastern York Co. H.S./York Co. AVTS Jr./Sr. year attended Vo-Tech (Electrical Program)

Experience: 1/67-7/68 - McDivett Elect. Co. Inc., Columbia, PA

Duties included Industrial Main. and Construction for local factories which did not employ a Staff Electrician.

Note: Worked 1/2 day Jan.-June 1967 (Vo-Tech Work/Study Program)
Worked full-time June 1967 - July 1968

7/68-7/72 - U.S. Navy
Discharge Rank: AE-2 (Pay Grade E-5)

Duty Stations:

1. Patuxtent River Naval Air Station
Duties included yearly inspection/

calibration of electrical systems on various Naval Aircraft.

2. VQ-2 Rota, Spain
Duties included, trouble shooting and repair of aircraft flight instrumentation, flight electrician, and ECM (Electronic Counter Measures) operator.

Naval Training:

1. 22 week "A" school on Electrical Theory

2. Various "C" schools on specific instrument systems.

7/72-5/73 - Resumed employment with McDivett Elect. Co. Inc.

7/73-9/75 - York Div. of Borg Warner Inc., York, PA

Duties included maintenance and construction of plant electrical systems.

Note: Worked full-time thru Sept. 1975 in addition to attending College full-time after March 1974.

4/74-11/77 - The Pennsylvania State University

Attended York Campus for first two years.
Attended Main Campus for Jr./Sr. years
Degree Confirmed: BSEE

11/77-9/79 - Metropolitan Edison Co.
TMI Nuclear Station
Job Title: Engineer I - Nuclear

9/79-Present - Shift Technical Adivsor - TMI-1

Incumbent F

Education: High School Graduate 1973
BS Nuclear/ Engineering
The Pennsylvania State University 1977

Experience: 6/77-Present - Metropolitan Edison Company - TMI

6/77 - Engineer Nuclear TMI

TMI-1 Refueling Outage
TMI-1 Physics Testing

Fuel Handling Equipment Operation/Repair
Engineering Support of Operations
TMI-2 Initial Fueling
TMI-2 Accident

9/79 - Shift Technical Advisor I - TMI-1

On Shift Engineering Support for Operations
STA Training Program Operator Accelerated
Requal Program.

6/80 - Shift Technical Advisor II - TMI

f. Interfaces

1. Onsite

The Shift Technical Advisor will, at times, seek assistance from Technical Functions and from the NSS Supplier AE and others throught the Technical Functions Division.

5.2.23 Manager Administration and Services

a. Function

The Manager of Administration and Services reports to the Vice President TMI-1 and assists him in the Adminitrative Functiooal Areas of Personnel, Budget/Cost Control, Security, Industrial Safety and Facilities. Additionalloy, he provides staff assistance services to the Vice President TMI-1 in Areas of Staff planning, screening, preparing outgoing correspondence, and meeting scheduling.

b. Responsibilities

Though direct interfaces the Vice President Administration and members of his staff, this position is responsible to assure effective day-to-day programs are implemented for TMI Unit-1 in the areas of Personnel Administration, Personnel Recruiting and Employment, Personnel Wages and Salary Administration, Retention, Employee Benefits Administration, Labor Relations, Payroll Administration, and Employee Evaluation; that an effective Personnel, Operations and Maintenance, and Capital Budget preparation, review and approval process is in effect, that Budget/Expenditure Analysis is being performed, and that Special Accounting activities are accomplished; that the TMI Security Plan is implemented in accordance with all applicable regulations, that Unit Security Operations, Administration, and Access Control are properly conducted; that the Industrial Safety Program is developed, organized, and implemented to insure that a safe working atmosphere exists for all employees, and that all applicable

safety regulations are met, that Safety inspections are conducted, that medical surveillance is accomplished, that the proper safety equipment is issued to employees, and that work practices are monitored and evaluated in terms of safety; that an organized Buildings/Trailer Management Program is in effect, that office supplies are provided and properly managed, that Telecommunications and Mail service are provided to the on-site staff, that office equipment is economically repaired and serviced, and that an effective Vehicle Parking Policy is in effect; that Unit 1 Administrative Procedures are prepared and implementated.

c. Authorities

Consistent with the responsibilities of this position, the Manager Administration and Services is authorized to institute procedures required to implement programs which improve or enhance the degree of Support Services provided to the plant operating staff. Additionally, consistent with the level of signature authority established, this Manager can extend job offers and approve other personnel transactions, authorize and approve expenditures and authorize facility changes.

d. Minimum Qualifications

This position is required to support the TMI-1 organization and shall have appropriate qualifications.

e. Incumbent Qualifications

The incumbent received a Bachelor of Science Degree in Civil Engineering in 1957 from the Pennsylvania State University. From 1957 to 1959, he served as a Navy Officer on an Amphibious Ship. He was employed by Met-Ed in 1959 and had held positions in the Transmission Engineering function for fourteen years; the Distribution Operations function for one year; the Operations Analysis function for four years, and was assigned to the position of Manager-Generation Administration on April 1, 1978 and has been serving as TMI-1 Manager Administration & Services since November 1979. He has attended the Public Utility Executive Program at the Graduate School of Business Administration, University of Michigan.

f. Interfaces

Direct interfaces are maintained with and functional coordination and guidance is provided from the Vice President Administration and members of his immediate staff.

Close lines of communications are maintained with all other Managers reporting to the Vice President TMI-1 for the purpose of coordinating and responding to requests for administrative services required by their staffs.

Liaison with the TMI-2 Manager-Administration and Services is maintained to coordinate services and to insure consistent practices exist in the functional areas of responsibilities assigned.

5.2.24 Manager Radiological Controls

a. Function

The Manager Radiological Controls TMI-1 reports to the Vice President Radiological & Environmental Control on all matters related to the establishing and implementing the Radiological Control Program development, support, and enforcement functions for the ongoing operation, maintenance and construction activities associated with TMI-1. He shall coordinate his group's activities with the TMI-1 Vice President and his staff in order to keep them informed of radiological controls matters.

b. Responsibility

The Manager Radiological Controls is responsible for:

- The development and implementation of a Radiological Control Program, which provides the needed high degree of protection from radiological hazards and meets or exceeds those requirements specified in the Radiation Protection Plan, Technical Specifications, the Code of Federal Regulations, as related to the NRC, or other Regulatory directives.

- The coordination of the Radiological Controls Department with the maintenance, operation and construction activities of other Unit 1 Departments.

- Technical review of all matters which involve external or internal radiation to personnel.

- The technical review of all operations which release radioactivity to the environment.

- The monitoring of proper procedures and proper documentation of all radioactive material received, transferred or shipped offsite by Unit 1.

- The maintenance of records reflecting the results of all inspections and surveys pertinent to the Radiological Protection Program in TMI-1.

- The technical review and approval of all of training including course content and instructors, which may affect the Radiological Protection Program, including the approval of all examinations which measure the effectiveness of such training for both radiological control technicians, operations, maintenance and craft trades personnel.

- The certification of qualification of all personnel who perform radiation monitoring or survey functions directly affecting the radiological safety of other personnel.

- The reporting to proper station authority all unusual operating conditions likely to affect personnel radiological safety.

- Radiological monitoring of radioactive waste processing and treatment activities.

c. Authority

The Manager Radiological Controls has the authority to direct the termination of any activity which is not being accomplished in accordance with radiological control practices and procedures.

d. Qualifications

The Manager Radiological Controls shall have a Bachelors Degree in Engineering or Scientific field and have 5 years of Nuclear Power Plant experience. Either the Manager Radiological Controls or the Radiological Control Manager shall meet the requirements of Regulatory Guide 1.8, Revision 1-R, May 1977 specified for the "Radiation Protection Manager."

e. Incumbent Qualifications

Present Position: Manager Radiological Controls TMI-1
Metropolitan Edison Company
Three Mile Island Nuclear Station
December 1979 to Present

Superintendent - Technical Support TMI-1
January 1979 to December 1979

Responsible for site engineering. Chairman of Plant Operation Review Committee (PORC). Staff consists of Electrical, Mechanical, I & C and Nuclear Engineers (approximately 15 engineers). In addition, the General Maintenance Service Computer group reports to the Superintendent - Technical Support.

Supervisor - Licensing
July 1976 to January 1979

Responsible for the direction, coordinator and administration of all licensing efforts for all Metropolitan Edison generating stations, including fossil and nuclear to ensure compliance with Federal, State and Local codes, regulations and permits. Supervised nine Engineers. Twice appointed Acting Manager Quality Assurance and Licensing during Managers extended absence.

Supervisor - Quality Control
August 1972 to July 1976

Responsible for supervision of all Quality Control personnel involved with the start-up and operation of TMI-1, including Audit. Surveillance, and Inspection of Nuclear Safety-Related Engineering, Operation, Maintenance, Refueling and Modification. Drafted and submitted to the Vice-President-Generation for review and approval the corporate Quality Assurance Plan and Procedures. Planned and developed the Quality Control Organization. Interviewed, hired, and trained the site Quality Control staff. Responsible for approving all site Quality Control Procedures; reviewing and concurring with site Engineering refueling, Operation, Maintenance, Modification and Testing procedures. Additional projects included being assigned by the Vice President-Generation to direct six engineers in a special project reviewing the nuclear plant design versus OSHA codes. Developed a list of over 300 items accepted by management for corrective action. The above included structural, mechanical, and electrical. Supervised a team of four engineers, who provided Quality Control inspection for the first year inspection of a 800 megawatt turbine generator (a company first).

Supervisor of Reactor Plant Services Saxton Nuclear Experimental Corporation
August 1970 to August 1972

Responsible for supervising plant personnel involved in radiation protection and control, radioactive shipments, waste treatment,

radioactive releases to environment, primary and secondary chemistry, fuel handling, and maintenance of reactor plant equipment. Senior member of Radiation Emergency Team. Developed fuel handling procedures and schedules and wrote preventive maintenance procedures. Participated in the development of Quality Assurance acceptance criteria for plant modifications and license changes. As Senior Site Engineer, provided liaison with Westinghouse, Engineers and Physicists involved with the experimental and failed fuel program. Obtained an AEC Senior Operators License Number SOP-1437. Supervised plant operations in the absence of the Supervisor of Operations.

Test Engineer Saxton Nuclear Experimental Corproration
March 1970 to August 1970

Participated in the collection of experimental program data and testing of plant modifications. Wrote Saxton's Emergency Preparedness Plan and Emergency Preparedness Procedures. Assisted in the training of operations personnel for various domestic and foreign utilities. Analyzed reactor operation with experimental and failed uranium and plutonium oxide fuels.

Educational Background:

B.S.E.E. - Pennsylvania State University
1970

U.S. Atomic Energy Commission Senior Operator License Number SOP-1437
1970

Basic Radiological Health - U.S. Department of Health, Education, and Welfare
1971

Occupational Radiation Protection - U.S. Department of Health, Education, and Welfare
1971

Basic Nuclear Power Review
104 hours NUS
1972

PWR Simulator Training
104 hours B & W
1973

Effective Communications
36 hours
1974

ASME Quality Assurance
24 hours
1974

Auditing Nuclear Quality
24 hours
1974

Supervisory Development Course
2 weeks
1978

Management Development
2 weeks
1978

Various Naval Schools on Physics, Mathematics Electronics, Computers, and Inertial Navigation
1978

Military:

U.S. Navy
Top Secret Clearance
ET-1 (SS)
1960 to 1966

Responsible for the maintenance and operation of the navigation system computers and Inertial Navigation System, including supervising 14 people on board the Polaris Submarine, U.S.S. George Washington (SSBN598).

f. Interface

The Manager Radiological Controls TMI-1 interfaces with the Manager Radiological Controls TMI-2 to obtain contract services for TMI-1. These services include personnel dosimetry, respiratory protection, technical support, maintenance and calibration of survey instrumentation, and technical support related to shipment of solid radioactive waste.

The Manager Radiological Controls interfaces with the Managers of Plant Engineering, Training, and Administration and Services for radiological related activities in chemistry, maintenance, operations, construction, radwaste treatment and processing, technician training, and security.

5.2.25 Radiological Controls Manager

a. Function

The Radiological Controls Manager is deputy to the Manager Radiological Controls, reporting to him, and in his absense, acts for him with the same responsibility and authority.

b. Responsibility

The Radiological Controls Manager is responsible for assisting the Manager, Radiological Controls in the performance of those areas of responsibility identified to that position.

c. Authority

The Radiological Controls Manager has the authority to direct the termination of any operation, maintenance, or construction which is not being accomplished in accordance with radiological control practices and procedures.

d. Qualifications

The Radiological Controls Manager shall have a Bachelors Degree in Engineering or Scientific field and have 5 years of experience in applied radiation protection work in the nuclear faci. ity dealing with radiological problems similar to those encountered in nuclear power plants, preferably in a nuclear power plant. Either the Radiological Controls Manager or the Manager Radiological Controls shall meet the requirements of Regulatory Guide 1.8, Revision 1-R, May 1977 specified for the "Radiation Protection Manager".

e. Incumbent Qualifications

This position is currently unfilled.

f. Interface

The Radiological Controls Manager interfaces with all TMI-1 departments as well as the Nuclear Regulatory Commission and Contractors, for radiological related activities in administration, maintenance, operations, construction, training, chemistry and radioactive waste processing.

5.2.26 Supervisor Radiological Control Technician

a. Function

The Supervisor Radiological Control Technicians reports directly to the Manager Radiological Control for the coordination and performance of Radiological Control support and enforcement functions accomplished by Radiological Control Technicians including contract technicians assigned to the Radiological Control Technicians Group.

b. Responsibility

The Supervisor Radiological Control Technician is responsible for ensuring that radiological control functions, through the supervision of the Radiological Control Foreman, are accomplished in full compliance with the Radiation Protection Plan, the Radiological Control Procedure and good radiological control practices. Specific responsibilities include such items as:

- The execution of radiological surveys, including their scheduling and review, for radiation, airborne radioactivity, and surface contamination to assess radiological conditions in work areas.

- Coordinating and approving the training given to personnel assigned to perform foreman and technician radiological control activities.

- The evaluation and approval of the qualifications of personnel assigned to perform radiological control foreman and technician functions.

c. Authority

The Supervisor Radiological Control Technician has the authority to direct the termination of an operation or activity which is not being accomplished in accordance with regulations and radiological control practices and procedures.

d. Qualifications

The Supervisor Radiological Control shall have a minimum of five years of Nuclear power plant related radiological control work experience.

e. Incumbent Qualifications

Academic: High School Graduate - 1963 - College Prep Course

College - one year GED Correspondence Course

Military: United States Navy - July 1963 - January 1971

Employment: Metropolitan Edison Company - February 1971 to Present

Nuclear Experience

Basic Nuclear Power School - USN - 26 weeks - classroom

Nuc. PWR. Prototype Training - USN - 26 weeks
a. 13 weeks classrooom
b. 13 weeks plant operation

Engineering Lab Tech School - USN - 12 weeks
a. 4 weeks classroom
b. 8 weeks plant radiological controls and chemistry analysis

Plant Mechanical Operator and Engineering Lab Technician on Nuclear Powered Submarine
a. Provided radiological controls for maintenance work on submarine
b. Performed radiation contamination and airborne contamination samples on submarine
c. Performed radiochemistry on nuclear power plant systems.

Radiological Control Shift Supervisor on a Nuclear Submarine Tender - 1 1/2 years
a. Performed radiation contamination and airborne contamination surveys on tender and on submarines
b. Supervised a shift of Rad Con monitors providing radiological controls during maintenance of radioactive systems and components on nuclear power submarines

Auxiliary Operator Training Program - Met-Ed
a. 26 weeks of classroom training (AO-10)
b. 26 weeks of plant system and operation training (AO-20)

Auxiliary Operator on TMI-1 - two years
a. Plant startup and operation of systems

Radiation - Chemistry Technician - Met-Ed - TMI-1 Three years

Radiation - Protection Foreman - Met-Ed - TMI-1 Three years

Supervisor of Radiological Controls Technicians TMI-1 - Met-Ed - TMI (From December 1, 1979 to Present)

f. Interfaces

This position interfaces with all TMI departments, including Contractors, to enforce compliance with approved radiological control and work practices.

5.2.27 Radiological Controls Foreman

a. Function

This position reports to the Supervisor of Radiological Controls Technician on assigned areas of responsibility to implement and enforce the Radiation Protection Program.

b. Responsibility

This position is responsible for the implementation of the Radiation Protection Program by the Radiation Control Technicians. This includes ensuring that all procedures involving Radiological Surveys, Radioactive Material Control and Radiation Exposure Control and Assessment are fully implemented. This position is also responsible to review the practices of other personnel working within restricted areas to provide additional assurance that all personnel are performing work in accordance with good radiological practices.

c. Authority

This position has the authority to direct the activities of the Radiological Controls Technicians in the performance of their duties as well as to determine the radiological control measures to be included in all work involving exposure of personnel to radiation or radioactive material. This position has the authority to stop any work being performed which is not in accordance with good radiological work practices.

d. Minimum Qualifications

High School graduate or equivalent and have at least three years experience as a technician qualified to ANSI/N18.1 - 1971 Paragraph 4.5.2, or be formally qualified through the approved TMI-1 Radiation Technician Training Program.

e. Incumbent Qualifications

Incumbent A

- High School Graduate 1968
- RCA Institute 1966-1968
- United States Navy Nuclear Power Program - 6 years 1968-1974
- Metropolitan Edison Company (Three Mile Island) 5 years 1974-present
  - Radiation-Chemistry Technician 3 years
  - Radiation Protection Foreman 2 years

Incumbent B

- High School Graduate 1968
- College - 2 years - 1968 - 1970
- Metropolitan Edison Company (Three Mile Island) 9 years 1970-Present
  - Lineman 3 years
  - Radiation-Chemistry Technician 5 1/2 years
  - Radiation Protection Foreman 1 1/2 months

Incumbent C

- High School Graduate 1969
- University of Pittsburgh - B.S. in Biology - 1969-1973
- PA Dept of Transportation - Lab Technician 4 months
- PA Dept of Environmental Resources-Maintenance 4 months
- PA Dept of Agriculture - Assistant Entomologist 6 months
- Metropolitan Edison Company (Three Mile Island) 1973-Present
  - Radiation-Chemistry Technician 6 years
  - Radiation Protection Foreman 1 month

Incumbent D

- High School Graduate 1970
- United States Naval Nuclear Power Program - 9 years ('71-'80)
  - Engineering Lab Technician/Electrical Operator Submarine Service ('74-'77)
  - Naval Nuclear Power Training Unit Instructor ('77-'80)
- Metropolitan Edison Company (Three Mile Island)
  - Radiation Protection Foreman ('80 - Present)

Incumbent E

- High School Graduate 1970
- United States Naval Nuclear Power Program - 9 1/2 years ('71-'80)
  - Engineering Lab Technician - Mechanical Operator 6 years
  - Naval Nuclear Power Training Unit - Staff Instructor 3 years
- Metropolitan Edison Company (Three Mile Island) 1980 - Present
  - Radiation Protection Foreman - 2 months

f. Interface

The position interfaces with every department and contractor organization which has need to enter the restricted area of the Unit to ensure the enforcement of approved radiological work practices and procedures. The interface includes interaction with regulatory agency inspectors in the review of the Radiation Protection Program.

5.2.28 Radiological Controls Technicians

a. Function

Under the direction of a Foreman, Radiological Controls Technicians support and enforce the implementation of the Radiological Control Program to insure that all procedures involving radiological surveys, radioactive material control, and radiation exposure control and assessment are fully observed and, that work being performed within restricted areas is in accordance with good radiological practices.

b. Responsibility

The Radiological Controls Technicians are responsible for the accomplishment of tasks related to the radiological support of plant operations, maintenance, and construction activities. Additionally, the Technicians are responsible to functionally enforce the field use of correct radiological control work practices.

c. Authority

Under the direction of a Foreman, the Technicians assure that radiological control measures are included in all work activities involving exposure of personnel to radiation or radioactive material. This position has the authority to stop any work which is not being performed in accordance with good radiological practices.

d. Minimum Qualifications

High School graduate or equivalent having at least one year applicable experience and meet or exceed the qualifications of ANSI/N18.1-1971, Para 4.5.2, or be formally qualified through the approved TMI-1 Radiation Technician Training Program. All Technicians will be qualified by training and examination on each area or specific task related to their radiological control function prior to the performance of those tasks.

e. Interfaces

The position interfaces with every TMI-1 department and contractor organization which has need to enter the restricted area of the unit to ensure the enforcement of approved radiological work practices and procedures.

5.2.29 Supervisor Radiological Engineering

a. Function

The Supervisor Radiological Engineering reports directly to the Manager Radiological Control on all matters involving the Radiological Control program design and the technical aspects related to implementation of the program support functions, including ALARA, Bioassay and Respiratory Protection.

b. Responsibility

The Supervisor Radiological Engineering is responsible for the supervision of the technical staff for the accomplishment of:

- Design reviews for proposed facilities, systems, and equipment that potentially affect radiation exposures.
- Accomplishing ALARA through periodic review of work conditions, review of procedures, requiring preplanning of work to include briefings, and developing and maintaining standard work practice and procedures.
- The calibration and maintenance of survey and laboratory instruments used in TMI-1.
- Maintaining technical liaison with the Radwaste Disposal Group for the handling, storage, and shipping of radioactive material from TMI-1.
- The preparation and/or revision of radiological control program implementing procedures to meet current regulatory requirements/standards.
- The maintenance of required survey and exposure records.
- The timely submission of required reports and notifications.
- Respiratory protection.
- Dosimetry and bioassay.
- The review and approval of radioactive releases.
- Conducts audits of the TMI-1 Radiological Programs and recommends and verifies implementation of corrective actions.

c. Authority

The Supervisor Radiological Engineering has the authority to direct the termination of any operation or activity which is

not being accomplished in accordance with regulations and radiological control practices and procedures.

d. Qualifications

The Supervisor Radiological Engineering shall be qualified per Paragraph 4.4.4 ANSI/N18.1-1971, and further, shall possess the appropriate qualifications prescribed for this position in Regulatory Guide 1.8, Revision 1-R, May 1977.

e. Incumbent Qualifications

Education: BS Physics - Fairfield University - 1970

MS Nuclear Engineering - Georgia Tech. - 1971

Military Service: U.S. Navy 1972-1974

Relevant Assignments:

Radiation Health Officer - Nuclear Submarine Tender 1972-1973
Duties: Dosimetry Program; training of Radiation Workers; Auditing of Submarine Rad Con programs.

Radiation Physicist - Naval Regional Medical Center 1973-1974
Duties: Radiation Surveys of x-ray facility; Licensing of Nuclear Medicing Lab; Establishment of Health Physics Program at the Nuclear Medicine Lab; Emergency Planning at NRMC to support the Naval Shipyard.

Radiological Engineer - TMI 1974-1976
Duties: Effluent release evaluations; Radiological Control Procedure writing; Bioassay evaluations; Emergency Planning; Radiation Monitoring System Performance Evaluation; HEPA and Charcoal filter testing; Review of design considerations for TMI-2

Radiation Protection Supervisor - TMI 1976-1977
Duties: Supervision of Radiation Protection Foreman for both TMI-1 (Operational) and TMI-2 (start-up and testing) in all areas of Radiation Protection, including field operations, dosimetry, bioassay, respiratory protection, effluent sampling and analysis, training, emergency planning, instrumentation calibration, etc.

Supervisor of Radiation Protection and Chemistry TMI - 1977-1979
Duties: Supervision of the Radiation Protection

Supervisor, one Radiological Engineer, three Chemistry Supervisors and the Radwaste Supervisor for TMI-1 and TMI-2. Duties included responsibilities for development and implementation of the Radiation Protection Program, Chemistry Program, Radwaste Processing and Shipping.

f. Interfaces

The Supervisor Radiological Engineering interfaces with other engineering groups, training, maintenance, operations, Nuclear Regulatory Commission, and other regulatory bodies necessary to perform his function.

5.2.30 Radiological Engineers

a. Function

As directed by the Supervisor-Radiological Engineering, this position functions to provide engineering support for the Radiological Control Program.

b. Responsibility

This position is responsible for providing technical support to the Radiological Control Program in the areas of general program design, respiratory protection, dosimetry program design, and ALARA program design. This position is responsible to ensure that various aspects of the Radiological Control Program are in accordance with regulatory requirements, guides and standards as well as correct radiation protection practices. The position is also responsible for the review of plant modifications and design changes to ensure that they are in accordance with ALARA considerations.

c. Authority

Radiological Engineers have the authority to recommend changes to the Radiological Control Program to ensure continued compliance with regulatory requirements. They have the authority to define procedural requirements necessary for implementation of approved program changes by the Radiological Controls Group.

d. Minimum Qualification

A Bachelors Degree in Health Physics, a Physical Science, Engineering or equivalent.

e. Incumbent Qualifications

Until such time as a permanent staff of three (3) Radiological Engineers are available at TMI-1, the Radiologcial Engineering Group will be supplemented by contract support resumes of the present Contract Support personnel are as follows:

f. Support Radiological Engineer A.

Education: BS Math with Physics Minor 1969

Completed a nuclear power plant operation course in 1972 (52 weeks). Course consisted of academic training in nuclear, mechanical, and electrical engineering; nuclear power plant health physics and chemical control including personnel and environmental monitoring, waste disposal, area radiation surveys, operation and calibration of radiation protection devices, and the establishment of radiation control points and issuing radiation work permits, and operations training in light water reactors. Qualified as a basic nuclear power plant operator.

Completed a Nuclear Accident Control consisting of one week of formal training in 1974.

Experience:

Over six years experience in radiological protection and personnel monitoring, including nuclear power operations, military safety programs, and government regulations.

Inspected Nuclear Regulatory Commission licensees within Region IV, that were authorized to use byproduct, source, and special nuclear materials; observed evaluated, and reported as to the compliance with the requirements of the NRC and the safety of licensee operations.

Performed as Assistance Health Physics Director for Walter Reed Medical Center. Duties included health physics supervision associated with a large medical research recovery group. Supervised up to 26 technicians.

Performed compliance evaluation of Radiation Protection Programs at various military installations. Surveyed medical radiation emitting devices for conformance to military specifications. Reviewed AEC license applications and survey reports for completeness and accuracy.

Performed as Senior Health Physics Technician at Three Mile Island Nuclear Power Station (1979 - Present).

Performed as a Health Physics Technician during refueling outage at Maine Yankee (1978).

g. Support Radiological Engineer B

Education:	1966	Central Florida Jr. College, Ocala, Florida, (Associates Arts Degree in Electronics)
	1977	University of Florida, Gainesville, Florida (Bachelor of Engineering Technology)
Work Experience:	1978-Present	Assistant Health Physicist, NUS Corporation, Rockville, MD
	1977-1978	Jr. Health Physicist Oconee Nuclear Station, Seneca, SC
	1976 Winter	Assistant Radiological Safety Officer University of Florida Medical Center, Department of Occupational Health & Safety, Gainesville, Florida
	1976 Fall	Internship in the Environmental Health & Safety at the University of Mass. Medical Center, Worchester, Mass.
	1976 Summer	Departmental Assistant in Radiation Safety at the University of Mass. Medical Center, Worchester, Mass.
	1976 Spring	Internship in Radiation Control at the University of Florida
	1971-1973	Technician and operator of Electro-Mechanical Training Devices, Groton, Conn.
	1969-1970	Leading Technician in charge of Electro-Mechanical Systesm and Departmental Coordinator for Planned Maintenance Procedures while on U.S.N. vessel

Support Radiological Engineer C

Education: BA - Benedictine College, Atchinson, Kansas - 1972

Short Courses: "Radionuclide Analysis by Gamma Spectroscopy"
Bureau Radiological Health, Winchester, MA
September 13-24, 1971

"Radiation Protection Guides and Dose Assessment"
Bureau Radiological Health, Montgomery, AL
March 29-April 9, 1971

"Health Physics Aspects of Radioisotope Use"
Walter Reed Army Medical Center, Washington, DC
June 24-28, 1974

"Nuclear Hazards Evaluation Course"
Interservice Special Weapons Training Group
Kirtland AFB, NM
October 7-11, 1974

"Ionizing & Nonionizing Radiation in Medicine"
HPS, University of Pennsylvania
Philadelphia, PA
July 2-6, 1979

"HP Certification Prep Course"
Baltimore Washington Chapter Health Physics Society
Gaithersburg, MD
January-May 1979

Military Training: "Nuclear Power Plant Operator/Health Physics Course"
Nuclear Power Field Office
Ft. Belvoir, VA
February 1968 - March 1969

"X-ray Specialist Course"
Academy of Health Sciences
Fort Sam Houston, TX
October 19, 1973 - February 8, 1974

Military Nuclear Experience:

April 1969 - June 1969	Health Physics Specialist SM-I Nuclear Power Plant Ft. Belvoir, VA
July 1969 - January 1970	Training Equipment Operator MH-1A Nuclear Power Plant Ft. Davis, CZ
February 1970 - March 1970	Equipment Operator MH-1A Nuclear Power Plant Ft. Davis, CZ
April 1970 - December 1970	Health Physics Specialist MH-1A Nuclear Power Plant Ft. Davis, CZ

December 1970 - January 1971	Technical Escort Spent Fuel Rod Shipments from Canal Zone to various locations within the continental US
January 1971 - January 1972	Health Physics Instructor Health Physics Br., Engineer Group Ft. Belvoir, VA
January 1973 - November 1973	Health Physics Specialist Research and Technology Division Engineer Power Group Ft. Belvoir, VA
April 1974 - January 1980	Health Physics Specialist Walter Reed Army Medical Center Washington, DC
January 1980 - Present	Nuclear Support Services, Health Physics Specialist, Senior Health Physicist for Nuclear Support Services, Inc. Three Mile Island Power Plant March 30 - April 1979

Civilian Nuclear Experience:

Worked as Senior Health Physicist for Institute for Resource Management, Bethesda, MD, and for Nuclear Support Services, Woodbridge, VA, during annual maintenance and refueling outages at the following nuclear power plants:

Oyster Creek (JCP&L)	Toms River, NJ	1974
H.B. Robinson (CP&L)	Hartsville, SC	1975
Prairie Island (NSP)	Red Wing, MN	1976
Prairie Island (NSP)	Red Wing, MN	1977

Technical Qualifications:

Certified Radioactive Materials Handler,
Engineer Reactors Group
Ft. Belvoir, VA 1970

Registered Radiation Protection Technologist,
National Registry of Radiation Protection Technologists
January 1977

Support Radiological Engineer D.

Education: BA Economics

Completed a nuclear power plant operation course in 1967 (52 weeks). Course consisted of academic training in nuclear, mechanical,

and electrical engineering; nuclear power plant health physics and electrical engineering; nuclear power plant health physics and chemical control including personnel and environmental monitoring, waste disposal, area radiation surveys,operation and calibration of radiation protective devices, and the establishment of radiation control points, issuing radiation work permits, and operations training in light water reactors. Qualified as a basic nuclear power plant operator.

Completed Radiographic Safety Office Course, May 1970

Experience:

Over ten years experience in radiological protection and personnel monitoring including nuclear power operations, military safety programs, and governmental regulations.

Performed compliance evaluations of radiation protection programs at various naval shore facilities. Surveyed medical radiation emitting devices for conformance to Navy and government specifications.

Reviewed U.S. Navy shore establishment A.E.C. license applications for completeness and accuracy.

Instructed radiography math, physics, and A.E.C. rules and regulations at the U.S. Navy school of non-destructive testing of metals. Taught survey instrument use at nuclear weapons training facility.

Health Physics Supervisor of an operating nuclear power plant. Additionally qualified as Auxilary Operator (nuclear) and Control Room Operator (nuclear).

Health Physics Supervisor during decommissioning and initial dismantling of a nuclear power plant. Participated in the decommissioning of another nuclear plant as a Health Physics Technician.

Performed as night Health Physics Supervisor during initial post-accident recovery operations from May to August 1979 at Three Mile Island, Unit II.

Worked as Health Physics Supervisor, Foreman, Senior Health Physics Technician, and instructor of employee health physics and NUREG 0041 at various NRC licensed facilitis in U.S.

Shipped large accumulations of radioactive waste from Antartica, IAW, IAEA Regulations Department of Transportation Regulations, and the USNRC. Shipped waste from various sites in the U.S. to licensed burial grounds.

Administered an active ALARA program at TMI-1 during restart modifications and outage.

Support Radiological Engineer E.

Education: BA Anthropology, Course Work Completed for MA in Latin American Studies.

Completed a nuclear power plant operation course in 1965 (52 weeks). Course consisted of academic training in nuclear, mechanical, and electrical engineering; nuclear power plant health physics; chemistry and radiochemistry; personnel and environmental monitoring, waste disposal, area radiation surveys, operation and calibration of radiation protection devices, fuel handling establishment of radiation control points, radiation work permits, and operations training in light water reactors. Qualified as Basic Nuclear Power Plant Operator, with health physics speciality.

Completed the Reynolds Electrical and Engineering Company (REECo) 10 day Radiological Emergency Response Operations Course at the Department of Energy's Nevada Test Site, Mercury, Nevada, 1978.

Completed various NRC sponsored Inspector and Licensing Courses for State Regulatory Personnel during period 1975 to 1980.

Experiences:

Over 10 years experience in radiological protection; personnel and environmental monitoring, including nuclear power operations (both civilian and military, stationary and floating); military and civilian safety programs; and government regulations (Federal and State).

Qualified as Nuclear Power Plant Operator 1st class in 1967.

Performed duties as the Environmental Monitor for the MH-1A Floating Nuclear Power Plant in the Panama Canal Zone.

Compliance Inspector for large Agreement State with over 1500 licensees.

Supervisor of Industrial Licensing for Large Agreement State with over 1000 industrial licensees.

5.0 THREE MILE ISLAND NUCLEAR STATION ORGANIZATION

5.1 GENERAL

Following the TMI-2 accident, Metropolitan Edison Company recognized through its own and other investigations of the accident that major organizational changes were desirable for more effective management control. These changes indicate Met-Ed's commitment to operational safety and provide significant improvement in the control of operational activities, and the technical and management resources directing and supporting facility operations.

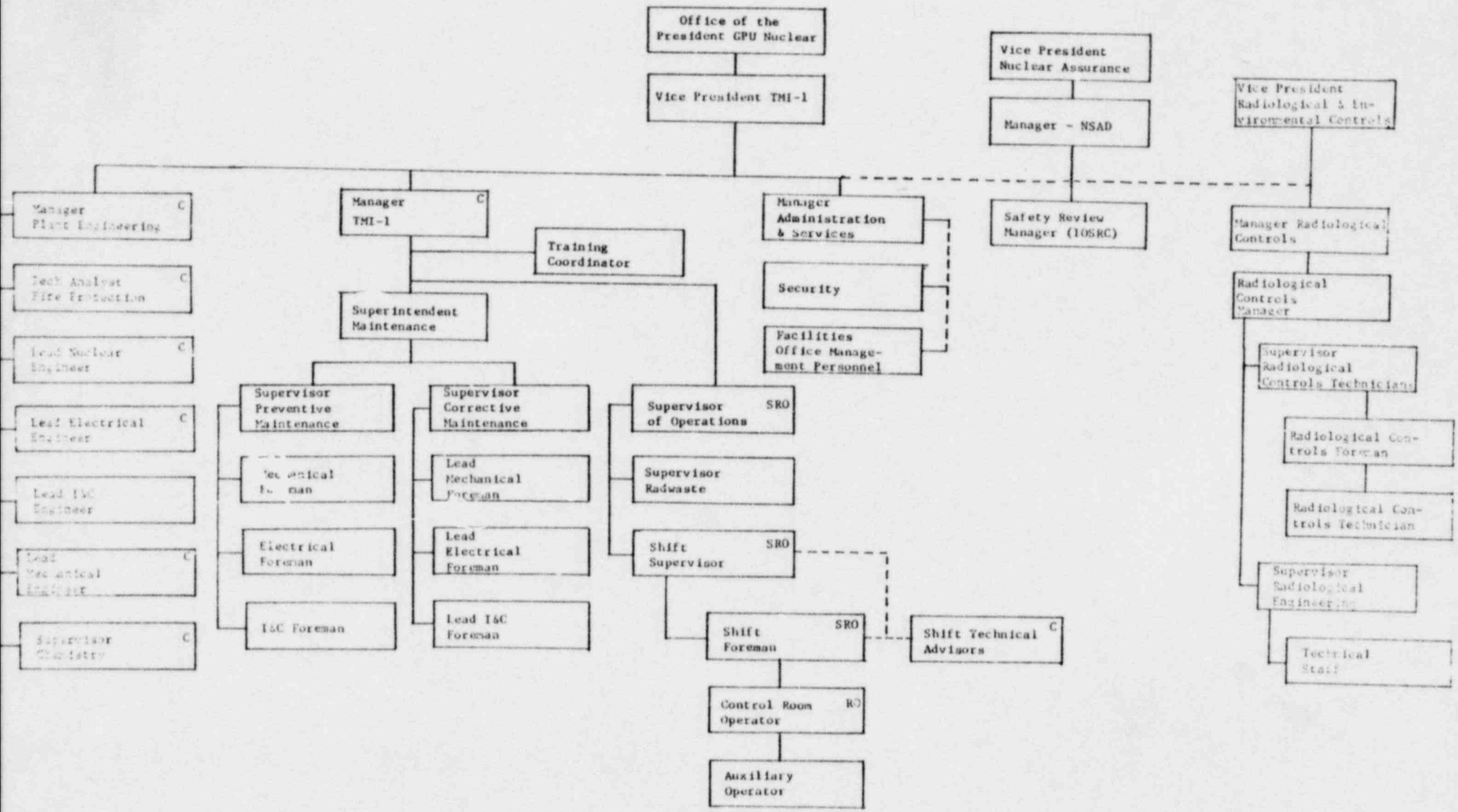
The first step taken was to combine the technical and management resources of Met-Ed and GPU Service Corporation Generation Divisions into a single organizational entity identified as the TMI Generation Group.

The TMI Generation Group was formed on July 30, 1979, to strengthen the overall management and provide greatly increased technical resources for the restart of TMI Unit 1 and the recovery of TMI Unit 2. The Group was headed by R. C. Arnold. To effect this new organization, Mr. Arnold was elected to the position of Senior Vice President of Met-Ed, and continued to serve as a Vice President of GPU Service Corporation. In this position, Mr. Arnold reported to Herman M. Dieckamp, President of GPU and GPUSC, and Acting President of Met-Ed. This reporting structure provided a direct link from the Chief Operating Officer of these three companies to the activities at TMI. The primary objective of the TMI Generation Group was to operate and maintain the plant safely and in accordance with all laws, NRC Regulations, Technical Specifications and established procedures.

This group was formed to take advantage of the wealth of nuclear experience represented by management and technical staff from within the GPU Service Corporation and the Edison Company. This realignment more than tripled the number of professionals that had TMI as their primary responsibility.

There were senior management personnel with an average technical experience well over 20 years reporting to the head of the TMI Generation Group in the areas of:

- TMI-1 Operations
- TMI-2 Recovery



Onsite Organization

FIGURE 5.2-1

5.3 STATION SUPPORT ORGANIZATION

The facility organization is supplemented by the other resources of GPU Nuclear, as shown in Figure 5.3-1. Six major areas of this organization: Technical Functions, Nuclear Assurance, Administration, Radiological & Environmental Controls, Maintenance & Construction, and Communications, provide support to the TMI-1 organization.

The Vice President-Technical Functions reports to the Office of the President-GPU Nuclear. In this position he will be responsible to provide a centralized technical capability to support generating facilities as described in section 5.3.1.

The Vice President-Nuclear Assurance reports to the Office of the President-GPU Nuclear. In the position he has overall authority and direct responsibility for all Nuclear Assurance activities. Nuclear Assurance has the responsibility for supporting GPU Nuclear plants in the areas of quality assurance, nuclear safety assessment, training, and operational safety support as described in Section 5.3.2.

The Vice President-Administration reports to the Office of the President-GPU Nuclear. In this position he has overall authority and direct responsibility as descrived in Section 5.3.3.

The Vice President - Radiological & Environmental Controls reports to the Office of the President - GPU Nuclear. In this position he is responsible for the onsite and offsite Radiological and Environmental Controls related to operating TMI-1 as described in Section 5.3.4. The Manager Radiological Controls (see Section 5.2.24) reports to this Vice President. By establishment of this position, day-to-day plant operation does not interfere with implementation of the Radiation Protection Plan and appropriate radiological and environmental monitoring.

The Vice President-Maintenance & Construction reports to the Office of the President - GPU Nuclear. In this position he will be responsible for major corrective maintenance and overhauls as specified in Section 5.3.5.

The Vice President Communications reports to the Office of the President - GPU Nuclear. In this position, he is responsible for communication between State and Local government officials and the company as well as communication between the press and the company under normal and abnormal conditionsas described in Section 5.3.6. The public and public officials will be kept informed of all company activities related to TMI by this Vice President both on request and routinely.

5.3.1 Technical Functions Group

The Technical Functions Group includes departments; namely, Licensing Systems Engineering, Engineering and Design, and Project Engineering.

This Division assures technical and regulatory adequacy of all aspects of nuclear activities to provide safe reliable and efficient operations in accordance with corporate policies and all applicable laws, regulations, licenses etc.

Technical Function's major functions are listed below:

- Perform, manage and direct all out-plant engineering, design, safety analysis and plan and direct startup and test activities.
- Maintain all plant technical basis and configuration control documents including fuel management.
- Control and perform interface activities with regulatory groups.
- Perform plant technical monitoring/assessment/productivity analysis, including major equipment failure analysis.
- Prepare/review/concur with all engineering and licensing procedures and licensing document correspondence and prepare SAR's, Technical Specifications and Environmental specifications.
- Specify, manage, direct all nuclear fuel material, conversion, enrichment and fabrication contractors.
- Review and assess the safety significance of NRC notices, bulletins, reports and plant operating experience information.
- Provide and direct operating plant shift technical advisors.
- Review and concur in all plant operating, alarm and emergency procedures for technical adequacy.
- Define technical requirements for training programs.

All staff includes only GPU permanent personnel. Support from outside contractors is available on short notice to supplement the GPU staff as necessary. This may be used to accommodate short-term manpower intensive needs or accommodate temporary vacancies. The Technical Functions Group management personnel each have at least a B.S. degree in engineering or science and the following:

	Years of Eng. Experience	Years of Nuc. Experience
Vice-President, Technical Functions	26	24
Manager of Licensing	11	9
Manager, Systems Engineering	22	22
Manager, Engineering & Design	20	14
Manager Project Engineering	12	12

a. The Licensing Department is responsible for the licensing and approval safety evaluation generating stations.

The current department staff is 27; with increases planned.

b. Systems Engineering Department is responsible for providing support in the areas of nuclear fuel management, process computer, control and safety analysis, plant operational analysis and human factors engineering. More detailed responsibilities are:

1. Nuclear Analysis & Fuels - Responsible for analytical and other activities related to core reloads, fuel management and the physics performance evaluation, including shielding analysis.

2. Process Computers - Responsible for all process computer systems, including both computer hardware (main frame and auxiliary memory units, imput/output equipment and CRT desplay devices) and computer software.

3. Control & Safety Analysis - Responsible for plant control systems engineering. Plant subsystem dynamic simulation and safety analysis.

4. Plant Analysis - Responsible for analyzing overall plant performance and the behavior of individual systems and components.

The current department staff is 30; with increases planned.

c. The Engineering and Design Department provides a centralized capability in the general mechanical, civil, electrical and instrumentation, and engineering mechanics areas. Other services include civil engineering and engineering standards and procedures. More detailed responsibilities are:

1. Engineering Mechanics - Technical expertise for the analysis of all structural and fluid mechanics problems, including piping, stress analysis and supports, general vibration and dynamics of mechanical equipment, acoustic noise, and fluid dynamics, such as water and steam hammer, cavitation and related problems.

2. Mechanical Systems - Primary responsibilities for the analysis, engineering and design of all fluid and materials handling systems.

3. Mechanical Components - Provides technical expertise in the aplication of specialized mechanical components including pumps, fans, valves, heat exchangers and power conversion equipment. Also responsible for the general area of water treatment and industrial waste management systems.

4. Electrical Power & Instrumentation - Responsible for analysis and design of plant main and auxiliary electrical power distribution systems, protective relaying, lighting, communications, and grounding and cathodic protection and design capability for instrumentation application and I&C circuits.

5. Design & Drafting - Responsible for providing generalized design and drafting support, including piping systems, electrical power and instrumentation, plant arrangements and equipment installation.

The current department staff is 62; with increases planned.

d. The Project Engineering Department is responsible for coordinating and directing of assigned projects, including all out-of-plant technical support for TMI operations.

The current group staff is 8; with increases planned.

5.3.2 Nuclear Assurance Program and Procedural Control

5.3.2.1 The organizational structure of GPU Nuclear and a description of the Quality Assurance Program for controlling the operational activities at TMI Nuclear Station are contained in the Operational Quality Assurance Plan for TMI-1. This Plan establishes the organization and the management controls and Quality Assurance Program necessary to assure that the operational phase activities at the TMI-1 are performed and controlled in a manner that will not endanger the health and safety of the public or the employees or contractors of GPU Nuclear. These activities are performed by the Operations personnel and those supporting activities such as radiation protection, surveillance testing, environmental monitoring, refueling, inservice inspection, modification, etc., which are required to assure continued operation in a safe manner. Inherent also in the operations of the Nuclear Station are those activities associated with the verification of the completeness and adequacy of the work performed and the provision of independent safety review and operational advice.

5.3.2.2 Nuclear Assurance Organization

The Nuclear Assurance Division is responsible to:

- Monitor all nuclear activities to assure that they provide the required high degree of safety and reliability and are carried out in accordance with corporate policies and all aplicable laws, regulations, licenses, and technical requirements.

- Provide training of corporation personnel as needed to carry out their duties and to meet corporate policies and all applicable laws, regulations, licenses and technical requirements.

- Provide support to the operating stations in the areas of emergency planning and analytical laboratory services.

The Divisions Major functions are given below:

- Monitor, evaluate, and assure that all activities having the potential for compromising nuclear safety are adequately addressed.

- Provide and maintain the qualified personnel to develop and administer the Operational Quality Assurance program and assure that it is implemented in all activities important to safety.

- Develop the site emergency plans and assure that emergency plans' preparedness is maintained.

- Provide the generating stations with chemistry and metallurgical analytical services and recommended chemistry requirements and specifications.

The Nuclear Assurance Organization consists of three groups identified as follows.

- Quality Assurance Department
- Training and Operational Safety Support Directorate
- Nuclear Safety Assessment Department

The Vice President-Nuclear Assurance has the overall authority and direct responsibility for all Nuclear Assurance activities as defined in the Operational Quality Assurance Plan. These activities include, but are not limited to performing overall management assessment in the following areas:

- Operational Quality Assurance Program
- Nuclear Safety Assessment Program

Additionally, the Vice President-Nuclear Assurance has specific staff responsibilities to the Office of the President relative to other departments within the GPU System in the following areas:

- Emergency Planning Coordination and Program Development
- Training Program Development and Administration
- Laboratory Support

The Quality Assurance Department provides independent assessment of these areas within the Nuclear Assurance Organization.

5.3.2.3 Quality Assurance Department

The Quality Assurance Department, under the direction of the Manager of Quality Assurance, reports to the Vice President-Nuclear Assurance. The Manager of Quality Assurance and the Vice President-Nuclear Assurance are independent of design, procurement, manufacturing, construction, operations, or maintenance, and report at a sufficiently high level to provide an independent assessment and evaluation of the effectiveness of the implementation of the Quality Assurance Program.

The Manager of Quality Assurance has the overall authority and organizational freedom to identify quality or management control problems

and provide recommended solutions. This authority and responsibility includes the stopage of work, or the recommendation that an operating nuclear unit be shutdown. The Manager of Quality Assurance has direct reporting authority to the Office of the President, and shall use this path when differences of opinion within the organization regarding quality cannot be settled to his satisfaction.

The organized Quality Assurance Department consists of five major sections. Listed below is a description of the responsibilities of each section.

(1) Design and Procurement Assurance Section - This section with a Quality Engineering Staff located both in the Corporate Headquarters and at TMI constitute the main technical support sections for establishing quality programs, and inspection requirements in support of design and procurement activities. The same group reviews quality-related materials and product specifications and procurement requisitions to assure that commitments to requirements have been established. Additionally, this group is involved with evaluation of specific vendors (contractors) and their QA programmatic controls against established requirements.

An element of the on-site Design and Procurement Assurance Section has the responsibility for reporting quality trending and performing final verification and acceptance of installation/modification documentation packages before turnover to Records Storage.

(2) Manufacturing Assurance Section - The primary responsibilities of this section are to perform those necessary post awarded quality related activities required to assure that vendors' products are designed, manufactured, and tested in accordance with those specified quality requirements. Trend information supplied by this group weighs heavily in the maintenance of the vendors' classification lists.

(3) Modifications/Operations Section - This section consists of two major subgroups, Quality Control and Operational Quality Assurance.

Quality Control is responsible for receiving inspection and the inspection and/or surveillance activities related to corrective maintenance, modifications, installation or new construction. The group has specialists, who are qualified to the appropriate levels of ANSI N45.2.6 and SNT-TC-1A. Additionally, the group has a Welding Engineering Section which reviews contractors' procedures and monitors control of special processes.

Operational Quality Assurance is responsible for monitoring functional testing and performing surveillance of all operations activities. The latter includes monitoring of plant

operations, preventive maintenance, radiation protection and the processing, packaging and shipments of containminated poductis, and radioactive wastes.

The Operational Quality Assurance Group is also responsible for in-service inspection and monitoring performance and results of pump and valve testing to the applicable requirements of ASME Section IV.

(4) Methods, Program and Audit Section - This section is responsible for QA Program development. This includes providing QA support for procedure development associated with the implementation of the QA Plan; coordinating the development of QA Department Procedures and developing methods of program assessment. This section is responsible for coordinating the QA Department Training Program and providing QA orientation training. Additionally, the group conducts independent evaluation and assessment of the program's implementation through the Quality Assurance Audit Program

The latter includes an evaluation of effectiveness of the programmatic aspects of the the Quality Assurance Program. This program is consistent with the requirements of ANSI N45.2.12 and utilizes auditors qualified to ANSI N45.2.23.

Assisting in this assessment is a full-time site audit group reporting independently to the Manager of Quality Assurance and the Vice President-Nuclear Assurance through the Section Manager, thus providing management assessment of the effectiveness of the program. Additionally, both sections are available to provide timely close out and verification of identified problems.

(5) Materials Technology Section - This is an off-site section which has the responsibility of supporting design in establishment and/or review of requirements. Additionally, the group is available as a staff group to support manufacturing, Construction and Operations in assessment and/or evaluation of identified materials technology problems. To help affect the implementation of this responsibility are the services of the off-site laboratory which now reports to the Training and Operational Safety Support Department.

The specific services provided by the Materials Technology Section include:

- Non-destructive Examination
- In-Service Inspection
- Materials Engineering Support
- Welding Engineering

Whereas, other sections have full-time technical expertise in these areas, this centralized group will provide technical direction.

5.3.2.4 Nuclear Safety Assessment Department

The Nuclear Safety Assessment Department (NSAD), under the direction of its Manager, reports directly to the Vice President-Nuclear Assurance. NSAD is a safety review group which is independent of design, construction, operations, modifications, procurement and manufacturing and reports at a sufficiently high level to provide an independent assessment and evaluation of the effectiveness and implementation of the Operational Nuclear Safety Program. The department's evaluations are not bounded by established nuclear regulations.

NSAD conducts assessments of all facets of nuclear power plant design and operation and considers their potential for compromising nuclear safety and provides management recommendations for improvements. The primary functions include:

(a) Identification of potential problems in nuclear plant design and operation.

(b) Investigate and assess the functional controls presently in existence for nuclear plant design and operations and their adequacy to properly assure nuclear safety.

(c) Develop and recommend to functional department managers additional controls, criteria and/or procedures which may be required to improve the control of design and operation of nuclear plants in meeting nuclear safety considerations.

(d) Serve as an office of ombudsman for all members of the Corporation having a concern for nuclear safety.

(e) Provide for an Independent Onsite Safety Review Committee as described in Section 5.4.

(f) Provide technical assistance to the General Office Review Board.

5.3.2.5 Training and Operational Safety Support

Training and Operational Safety Support Department (T&OOS) is headed by the Director T&OOS and reports directly to the Vice President-Nuclear Assurance. Training and Operational Safety Support is made up of the System Laboratory, the Training Department, and Safety Support Staff Group.

This department's emphasis is oriented heavily toward training since the TMI-2 post accident reviews by all organizations, including GPU recognized that training for nuclear activities should be improved. The Director, Dr. Robert L. Long, was selected because of his extensive expertise in the training field. Dr. Long's qualifications are given below:

Education: B.S. - Electrical Engineering, Bucknell University, 1958
M.S. - Nuclear Engineering, Purdue University, 1959
Ph.D. - Nuclear Engineering, Purdue University, 1962

University of New Mexico Service: 13 years

1965-1968: Assistant Professor of Nuclear Engineering
1968-1973: Associate Professor of Nuclear Engineering
1973-1978: Professor of Nuclear Engineering
1972-1974: Assistant Dean, College of Engineering
1974-1975: Acting Chairman, Chemical & Nuclear Engineering Dept.
1975-1978: Chairman, Chemical & Nuclear Engineering Department

Other Work Experience - Research, industrial, etc.:

1979-1980: Directr - Reliability Engineering, GPU Service Corp., Parsippany, N.J.
1978-1979: Manager - General Productivity Department, GPU Service Corp., Parisippany, N.J.
1976-1977: Sabbatical leave - Project Engineer, Electric Power Research Institute
1970-1971: ASEE - Ford Foundation Resident Fellow, Associate Reactor Engineer, Indian Point Nuclear Power Station, Con Edison of New York, Inc.
1965-1968: Research Participant in the field of fast burst reactor reflector effects and high yield burst reactors, one-half time at Sandia Corporation.
1966-1967: Leave of absense from UNM - Research Associate, Nuclear Research Division, Atomic Weapons Research Establishment, Aldermston, Berkshire, England
1964-1965: GS-14, Civil Service, Reactor Specialist, Nuclear Effects Branch, White Sands Missile Range, New Mexico
1960-1962: Student Research Associate, Argonne National Laboratory, Argonne, Illinois
Summer, 1960: Instructor and technical reader, Purdue University, Lafayette, Indiana

Scientific and professional societies:

American Nuclear Society (held numerous responsibilities on national and division committees)
Sigma Xi
Atomic Industrial Forum
American Association for the Advancement of Science

Description of professional experiences:

a. August 1980 - Present:

Director - Training & Operational Safety Support, GPU Service Corporate, Parsippany, N.J. responsible for the direction of Corporate, TMI-1, TMI-2, and Oyster Creek Training Departments, the System Laboratory and the Emergency Plan Coordinators for TMI and Oyster Creek.

February 1980 - August 1980 Acting Director of the Nuclear Assurance Division which includes the Quality Assurance Department, the Nuclear Safety Assessment Department and the Training & Operational Safety Support Directorate.

b. August 1979 - January 1980:

Director - Reliability Engineering, GPU Service Corporation, responsible for the direction of five functions providing technical support to the TMI Generation Group and the three GPU operating companies. These functions included the Quality Assurance Department, the System Laboratory, the Information Management Department, the Nuclear Safety Audit Department, and the Generation Operations Support staff.

c. April 1979 - July 1979:

Member of TMI-2 Recovery Team arriving on site March 29, 1979 Involvement included Data Reduction and Management Group, head of the Accident Assessment Documentation Team and Supervisor of the Technical Planning Group the GPU Accident Investigation Task Force.

d. June 1978 - March 1979:

Manager-Generation Productivity, GPU Service Corporation, Parsippany, N.J. responsible for the staffing and program development of the newly formed Generation Productivity Department. Activities included the development of an Availability Improvement Program for implementation throughout the GPU System. The program was concerned with total plant performance for all fossil and nuclear units and included:

1) Developing an integrated generating unit reliability program.

2) Developing a reliability/availability/maintainability data system.

3) Developing a failure root cause analysis system and procedures.

4) Identifying critical controllable factors and developing procedures for a thermal performance improvement program.

5) Developing a generating unit performance testing program.

6) Developing procedures and management accounting methods for instrumentation maintenance, major outage work management, and preventive maintenance programs.

e. 1965-1978:

Faculty member, Nuclear Engineering Department, University of New Mexico. Was actively engaged in teaching and research, primarily in experimental reactor physics. During 1965-66, I was engaged in half-time research at Sandia Laboratories and served as Project Engineer for the design of the SPR-II, fast burst reactor. During

1967-69, again half-time, participated in the design and carrying out of experiments to characterize the dynamic behavior of SPR-II. During 1969-70, directed a campus fast reactor physics experimental facility and directed the Ph.D. thesis of C. C. Price on reflector effects on fast burst reactors.

Licensed Senior Reactor Operator on the UNM AGN-201IM Training Reactor, 1967-1978, and served as Chief Reactor Supervisor 1968-70 and 1973-76. 1969-70 supervised the move of the reactor into a new laboratory, the complete redesign and assembly of the nuclear instrumentation and control system, and an increase in maximum operating level from 0.1 to 5 watt. I served as Director of the Nuclear Engineering Laboratories, 1971-76.

During 1972-74 served as Assistant Dean (half-time) of the College of Engineering. During that time period, served as principal investigator for a contract with Consolidated Edison Company of New York to analyze axial xenon redistribution and power shaping in large pressurized water reactors. Under contract with the USAEC, developed two "neighborhood TV short courses" on nuclear energy and energy and the environment for use in public education efforts.

Effective July 1, 1974 was appointed Acting Chairman of the Department of Chemical and Nuclear Engineering and in February 1975, was appointed to a four-year term as Department Chairman to begin July 1, 1975.

From 1974-76, supervised the design, development and on-campus installation of a fossil power plant simulator (Ph.D. dessertation for R. Bush) under sponsorship of the New Mexico Energy Resources Board and Public Service Company of New Mexico.

From 1977-78, served as principal investigator on a project, sponsored by the New Mexico Energy Institute, to determine generally accepted pre-activity background levels for radon in the very active uranium mining and milling Grants/Ambrosia Lake area of New Mexico.

Together with M. J. Ohanian, University of Florida, worked as a representative of the Nuclear Engineering Department Heads Committee to increase the support of government sponsored energy R&D in university engineering colleges. This activity included successful interaction through the U. S. Senate of education support amendments to the 1974 ERDA and 1977 DOE Authorization Acts. It also included organization of university/government exchange meetings with USAEC, ERDA, NRC, and an EPRI/University exchange meeting.

Teaching were centered around the development and presentation of effective laboratory courses, while also periodically teaching the following lecture courses: Introduction to Nuclear Engineering, Applications of Nuclear Energy for Non-Engineers, Reactor Kinetics and Control, Nuclear Systems Design.

f. 1976-77:

Sabbatical leave with the Electric Power Research Institute, Palo Alto, California. During my twelve month sabbatical, worked as a Project Engineer in the Nuclear Engineering and Operations Department with responsibility for managing projects in availability engineering and development of an "optimized" utility power systems data base. Supervised and worked with an EPRI contractor to complete a PWR steam-generator performance survey. These various projects provided an opportunity to visit, and closely interact with many utility, manufacturer, and governmental agency personnel.

g. 1977-79:

Consultant, EPRI. Upon return to the UNM campus, continued, as an EPRI consultant, to monitor reliability data base and records management projects. Coordinated the conduct of an EPRI Availability Engineering Workshop held in Albuquerque, October, 1977. While with GPUSC, I have continued as a consultant to EPRI on availability engineering programs.

h. 1971-72:

Consultant, General Physics Corporation. Revised the Reactor Engineering Volume of the General Physics Corporation "Academic Program for Nuclear Plant Personnel."

i. 1970-71:

ASEE-Ford Foundation Resident Fellow, serving as Associate Reactor Engineer with Con Edison of New York, Inc. Was involved primarily in the coordination and planning of the repairs to the Indian Point Unit No. 1 primary coolant system. Performed various tasks of the Unit No. 1 reactor engineer. Was principal co-author with R.B. Hayman of the Company's initial Quality Assurance Program report for Unit No. 1. On a few occassions, assisted in the Training Program for the Unit No. 2 operators and in the preparation of Unit No. 2 procedures.

j. 1966-67:

Temporary Research Associate, Nuclear Research Division, Atomic Weapons Research Establishment. Prepared the commissioning schedule for VIPER, Mark I, a fast burst reactor; assisted in the safety analysis and evaluation of the reactor, and served as a Senior Reactor Physicist and Shift Supervisor during the initial startup. Planned the Training Program, and presented some of the lectures for the initial startup staff.

k. 1962-65:

Reactor Specialist (GS-14), WSMR Fast Burst Reactor Facility. Served as the Facility Supervisor during the final design, construction, startup, and first year of operation of the FBRF, a fast burst reactor. This included responsibility for training of the staff, monitoring of contractor performance, preparation of the Final Safety Analysis Report, preparation of the startup and operating procedures, and analysis of the reactor physics operational data.

1. 1960-62:

Student Research Associate, Argonne National Laboratory. Was trained and certified as a co-operator, operator, and supervisor on the Argonne Thermal Source Reactor (ATSR) while performing my doctoral dissertation research. Designed and built a reactivity measuring system for determination of neutron absorption resonance intergrals. Assisted in the training of replacement operators for the ATSR.

The Training Department will develop an overall training needs evaluation which will provide the basis for a total GPU Nuclear Training Program. The technical and administrative directiin of the Generation Unit Training Programs will be provided by the Department of Manager. Training programs will include such areas as:

(a) Management Skills and Supervisor Training

(b) Licensed Operator Training (RO at SRO)

(c) Maintenance Training

(d) Health Physics and Radiation Control Training

(e) Emergency Plan Training

(f) Quality Assurance Training

(g) Chemistry Technician Training

(h) General Employee Indoctrination and Training

(i) Instructor Training and Certification

(j) Other Specialized Technical Training

The Department will work with the generating units to develop effective job descriptions, course objectives and lesson plans. Final evaluation and certification of trainees will rest with the generating units and support organizations. The Training Department will coordinate the maintenance of appropriate training records, scheduling of training classes, and simulator training, and development of instructors. The Department will also conduct an ongoing evaluation of training program effectiveness, instructor performance and course material updates.

Requirements for full control room and part-trask simulators will be evaluated along with other training facility needs. Recommendations from investigative and special training study groups will be evaluated and appropriate responses developed. Close contact will be maintained with the Institute for Nuclear Power Operations and other appropriate industry groups.

T&OSS also provides Emergency Planning expertise in the following areas:

(a) Development and maintenance of the Emergency Plan.

(b) Provides competent staff members to act as the Emergency Plan Coordinators.

(c) Provides management evaluation of the Emergency Planning Program.

(d) Provides technical audit assistance to the Quality Assurance Audit Group.

The System Laboratory performs off-site analysis for all plants within the GPU System. It also provides technical guidance and evaluation support to Operations and the QA Methods/Program/Audit Section on technical audits of specific plant functions.

5.3.2.5.1 Manager Training TMI-1

a. Function

The Manager-Training TMI-1 reports to the Director Training and Operation Safety Support. In this position, he is responsible for the operator training, technician training, accelerated operator retraining, and training and educational development. The Technician Training Section will include training for maintenance, chemistry and radiological control technicians and General Employee Training. The Operator Accelerated Retraining Program is a broad program based upon changes and lessons learned as a result of the TMI-2 accident.

b. Responsibility

This position is responsible for the training of all personnel at TMI. This responsibility is discharged through an organization structure devised to address training consistent with established functional disciplines. In addition, the organization provides the administrative support necessary to conduct the major programs. The principle responsibilities of this position are:

1. To assure the content and conduct of training for Reactor Operatorsand Maintenance Technicians, and to insure professional personnel and management personnel meet Federal, State, and Local regulatory requirements, and conform to established industry standards.

2. To oversee the development and maintenance of a viable station training philosophy.

3. To select and develop a competent training staff

c. Authority

The Manager-Training TMI-1 has the authority to schedule and implement approved TMI Training Programs. He has the authority to recommend SRO and CRO candidates for NRC license examinations to the Manager Operations & Maintenance.

d. Minimum Qualifications

A Bachelor's Degree in Engineering or a related science is required. An advanced degree is also desirable. Eight years of experience in nuclear engineering, nuclear plant operations, industrial training/education, and/or college teaching is required with at least four years experience related specifically to training.

e. Incumbent Qualifications

Education: B.A. - Physics, Economics, Mathematics, Albion (Michigan) College 1967

Ph.D. - Nuclear Engineering - University of Illinois, Urban-Campaign 1972

Professional Experience:

1980-Present	Manager, Generation Training; Three Mile Island Nuclear Station; GPU Service Corporation; Middletown, Pennsylvania
1977-1980	Associate Professor; Department of Chemical and Nuclear Engineering; University of New Mexico, Albuquerque, New Mexico
1974-1977	Assistant Professor; Department of Chemical and Nuclear Engineering; University of New Mexico; Albuquerque, New Mexico
1972-1974	Senior Physicist; Reactor Physics and Computational Analysis; Comustion Engineering, Inc., Windsor, Connecticut
1972-1974	Adjunt Faculty; Physics Department; University of Hartford, West Hartford, Connecticut

f. Interfaces

1. Offsite

The position of Manager-Training interfaces with Technical Functions in the areas of regulatory training and LER incorporation into the Operator Training Program.

Interface with technical functions iesures the utilization of knowledgeable and qualified engineers to develop training materials and provide instruction in accordance with appr.ved training programs.

2. Onsite

This position interfaces with the TMI-1 Station Training organization in the:

a. Conduct of on-shift training as scheduled by the Training Department.

b. Conduct of performance reviews of training programs.

c. Coordination of station personnel assignment to scheduled training.

d. Establishment of training requirements.

e. Conduct of Needs Analysis and Job Analysis with respect to training programs.

5.3.2.5.2 Supervisor Operator Training

a. Function

The Supervisor Operator Trainin.; reports to the Manager Training TMI. In this position, he is responsible for the planning, preparation and conduct of the Licensed and Non-Licensed Operator Training and Requalification Programs. Included is the Operator Accelerated Retraining Program, which is based upon the changes and lessons learned as a result of the TMI-2 accident.

b. Responsibility

This position is responsible for the training of all licensed and non-licensed operators and senior reactor operators at TMI-1. This responsibility is

discharged through an operator training organization structure devised to address the trainee along functional discipline lines. Principle accountabilities of this position are:

1. Formulation, administration and implementation of approved operator training programs for exempt and non-exempt personnel at the Three Mile Island Nuclear Station. This includes curriculum development, training material preparation and presentation, scheduling, examination preparation and administration, and program evaluation.

2. The implementation of initial specialized nuclear training programs for Auxiliary Operators, Control Room Operators, Shift Supervisors and Foreman, and Plant Engineers.

3. The development and implementation of the TMI Operator Requalification Program (10 CFR 55 requirement) for continued NRC licensed operator certification and continued station operations.

4. The development of procedures necessary to implement an effective SRO, CRO and Auxiliary Operator training program.

c. Authority

The Supervisor of Operator Training has the authority to schedule and implement approved training programs.

d. Minimum Qualification

At the time of assuming the position, the Supervisor of Training shall have a high school diploma or equivalent and four years of experience in the educational or training discipline. At least one year of this experience should be nuclear.

e. Incumbent Qualifications

Education: Military Schooling -

Submarine Officer Advanced Course 1976
Graduated with distinction. Awarded David Lloyd Award for excellence.

Submarine Officer Indoctrination Course, 1970.

Nuclear Power Prototype Training, 1970.

Nuclear Power School, 1969.

U.S. Naval Postgraduate School, graduated 1969. M.S. in Management.

U.S. Naval Academy, graduated 1968. Class standing 44 out of 835. B.S. - Major in Political Science and Economics.

Farrell High School, Farrell, Pennsylvania, 1964.

Military Service: Entered U.S. Navy in June 1968.

Engineer Officer: USS Cavalla (SSN 684) 1977 - 1980
Rank - LCDR.
Responsible for operation and maintenance of nuclear propulsion plant and submarine auxiliary and interior communications systems. Supervision of approximately 65 people in training and operation of ship's propulsion plant and associated systems. Experience included both extended deployments and shipyard overhaul.

Company Officer: U.S. Naval Academy 1974 - 1976
Supervised the professional training and development of approximately 120 midshipmen of all classes. Duties included teaching a formal course of instruction, personal counseling in all areas of midshipmen performance, and recruiting and pre-screening of applicants for the nuclear power program.

Department Head and Division Officer:
USS Nautilus (SSN 571) 1970 - 1974
Served as Weapons Officer, Damage Control Assistant, and Electrical and Reactor Controls Division Officer in both operating and shipyard overhaul environments. Supervised approximately 20 people in each assignment.

TOP SECRET Clearance, February 1977

Awards: Navy Commendation Medal, 1978
Navy Expeditionary Medal, 1977
Navy Achievement Medal, 1975
Letters of Commendation, 1974, 1971

f. Interface

The Supervisor Operator-Training, interfaces with the TMI-1 station training organization to insure continuity and compliance with training program requirements. Interface with the Nuclear Regulatory Commission Licensing Branch for the scheduling of NRC operator examinations. Interface with the Babcock and Wilcox Corp. for the scheduling of Nuclear Steam Supply System and Simulator Training.

a. Function

The Supervisor-Technician Training reports to the Manager-Training in performance of his duties. He is resonsible for supervising the performance of personnel assigned to the training department in the following groups:

1. Maintenance

2. General Employee

3. Chemistry Controls

4. Security

b. Responsibility

The Supervisor-Technician Training is responsible for developing and conducting training in the following areas:

1. Maintenance Technician Training

2. Radiological Controls Training

3. Chemistry Training

4. Security Training

5. Emergency Plan Training

6. General Employee Training

In addition, he is responsible for providing operational maintenance personnel training in the following areas:

1. General Employee Radiological Controls Training

2. General Employee Security Training

3. Operator Radiological Controls Training

c. Authority

The Supervisor-Technician Training has the authority to develop and conduct approved training programs in his areas of responsibility. In addition, he has the authority to meet directly with other Station Department Heads in order to develop specific technical training program needs and related requirements.

d. Minimum Qualifications

At the time of assuming the position, the Supervisor-Technician Training shall have a high school diploma or equivalent and four years of experience in the related educational or training discipline.

e. Incumbent's Qualifications

Education: High School Graduate - 1955
Reading Senior High School
Reading, Pa.

Pennsylvania State University
University Park, Pa.
Accumulated 83 Credits (1961-1969)

Licenses Held:

1) AEC Operator's License OP-1882
Pennsylvania State University
License Effective April 1965
Expired April 1967

2) AEC Senior Operator's License
SOP-750
Pennsylvania State University
Effective May 16, 1966
Expired May 16, 1968

3) FCC 2nd Class Radio Telephone
License (1954 - Present)

4) FCC General Class Amateur Radio
License (1954 - Present)

Employment History: Employed by Metropolitan Edison Company (Approx. 10 years) and stationed at TMI since 1969.

Met-Ed

Sept. 1978 to Present - Promoted to Supervisor of Operator Training Sept.1, 1978. Responsible for the supervision

of the Training Deptartment personnel and the administration of the License and Non-license Training Programs.

Nov. 1977 to Sept. 1978 - Assumed the position of Acting - Supervisor of Training under the direction of the Director of Generation Training. Responsible for the supervision of the Training Department and administration of specific License and Non-license Training Programs.

Nov. 1976 - Nov. 1977 - Assumed the position of Group Supervisor - Technical Training and reported to the Supervisor of Training - TMI. Responsible for the administration of the assigned TMI Non-license Training Programs and the supervision of the assigned Administrators of Nuclear Technical Training.

August 1973 - Nov. 1976 - Held the position of Administrator - Nuclear Technical Training and reported briefly to the Station Engineer and later to the Supervisor of Training - TMI (June 1974 - Jan. 1976). Assisted with the administration of on-going License and Non-license Training Programs.

Sept. 1969 - Oct. 1973 - Employed by the Metropolitan Edison Company - TMI as a Training Specialist and reported to the Station Superintendent. Responsible for organizing the Training Department and the administration of the Unit I Training Programs under the direction of the Station Superintendent.

PENNSYLVANIA STATE UNIVERSITY

Sept. 1963 - Sept. 1969 - Employed by the Pennsylvania State University Nuclear Engineering Department. Having qualified as an AEC Licensed Operator/ Senior Operator at Penn State University, held the position of Training Supervisor under the direct supervision of the Supervisor of Training. Was responsible for supervising and operating the Triga Mark III research reactor for numerous

nuclear research projects. Supervised and trained many Nuclear Engineering Graduate students and foreign exchange students for their AEC Operator's License to operate the Triga reactor. Was also involved in the creation and teaching of Operator Training Programs for utility personnel.

WESTERN ELECTRIC COMPANY

Sept. 1956 to Sept. 1961 - Employed by the Western Electric Company, Laureldale, Pa. as an Electronics Technician.

f. Interface

The Supervisor-Technician Training interfaces with the other training sections in the Training Department, the TMI-1 Station Training Organization and with TMI Generation Group engineering personnel for technical assistance. In addition, direct liaison is authorized with other station Department Heads and off site training contractors in performance of his duties.

5.3.2.5.4 Supervisor-Career Development Training

a. Function

The Supervisor-Career Development Training reports to the Manager Training. His functions are Career Development Training, Supervisory Development Training and Management Training. The Career Development Training will include technical and non-technical training in support of the individual career development. Supervisory Development Training Groups will identify, develop and conduct those specific training courses and programs for supervisory and management personnel at the TMI Station. These include Shift Technical Advisor Training and Decision Analysis Training for Shift Supervisor and Management personnel.

b. Responsibility

This position is responsible for training general station personnel and station supervision and management. This responsibility is discharged through a Training Section organization structured along functional lines. Principle responsibilities of this position are:

1. To implement training directives from the Manager-Training for the areas of general employee

training, support training and supervisory development and management training.

2. To direct, coordinate and administer the training and retraining programs and activities of the subordinate career development training groups.

3. To interface with other training sections and the TMI-1 training organization to identify, develop and implement general, supervisory, and support training programs.

4. To assure that training program content and conduct meet applicable Federal, State and Local regulatory requirements and conform to industry standards.

5. To oversee the dissemination and implementation of appropriate training procedures and practices.

6. To assist the Manager-Training in the evaluation of training program effectiveness.

7. To administer and implement the department training philosophy and assure transmittal of the philosophy to subordinate groups.

c. Authority

The position is delegated the authority from the Manager-Training to discharge the necessary duties and responsibilities of the Career Development Training Section. He has the authority to develop and implement approved programs in the areas of his responsibility.

d. Minimum Qualifications

The Supervisor-Career Development Training will possess the education, training, expertise, and experience necessary to discharge the functioning of the training section, and shall have a Bachelor's Degree and four years experience in education or training, or equivalent.

e. Incumbent Qualifications

Educational Background:

Degree	Educational Institution	Graduated	Major
M.S.	Southern Illinois University Edwardsville	1978	Education
B.S.	Southern Illinois University Carbondale	1977	Occupational Education
A.S.	New York State	1976	Liberal Arts

Experience:

Oct. 1975-Present: Lead Instructor
Trident Technical College, Continuing Education Department. Areas of instruction include: Microcomputer Theory and application; small computer maintenance and troubleshooting; Programmable Controllers; Instrumentation, Process Control Loops, Theory and Troubleshooting. Responsible for the development and implementation of a comprehensive training program used to train control equipment technicians at the DUPONT Plant at Cooper River.

Conselor
Adjunt staff, Dorchester Medical Health Center, providing marriage, individual and group counseling.

Feb. 1974 - July 1975: Damage Control Assistant
US Navy; assigned to USS Hunley in Charleston, SC. Duties included supervision of the training of the 1100 crew members. Coordinated the training and developed the training procedures and policies for Damage Control; during this period the ship received numerous commendations for outstanding performance in the Damage Control Training Exercises.

Sept. 1971 - Feb. 1974: Logistics Specialist
US Navy, Special Projects Office, Technical Representative for the Navy at a Government Contractors site in New York. Conducted training for the Navy Department on computer controlled Inventory management systems.

Jan. 969 - Sept. 1971: Ship Superintendent
Diesel powered submarines, Philadelphia Naval Shipyard; performed the liason and training for the foreign ships in all aspects of submarine operations.

Dec. 1961 - Dec. 1968: Chief Reactor Control Operator
Nuclear Power submarines; responsible for the training of Atomic Power Plant Operators; conducted training in the following areas:

1) Math
2) Physics
3) Thermodynamics
4) Nuclear Theories
5) Nuclear Propulsions

Apr. 1955 - Dec. 1961: Electronics Technician
Various types of Naval Vessels. Entered the Naval Service as a Electronic Field Seaman Recruit in 1955. Completed 20 years of service July 1975 as a Naval Officer; Electronics Specialist, with a grade of CWO-3.

Technical Military School:

Damage Control Officer Training	1968
Magnetic Amplifiers Atmosphere Analyzer, Temperature Monitoring and Hydrogen detection	1964
Submarine School	1963
Nuclear Power Prototype Training	1963
Basic Nuclear Power School	1962
Gyro Compasses	1960
Instructor Training School	1959
Interior Communications Electronics School, Class "A" and "C"	1955/1956

f. Interface

1. Offsite

The position interfaces with the TMI Generation Group Administration Division in the areas of Supervisory Development Training Programs. Also interfaces with academic institutions and industry training organizations. Additional interface with regulatory agencies to further define requirements of training programs.

2. Onsite

The position interfaces with other training sections, the Station training organization, and TMI Station departments to develop and implement the training and retraining programs for general employees, support training, and supervisory development.

5.3.3 ADMINISTRATION

The Administration Division, which is under the direction of the Vice President-Administration, has responsibilities to provide in an efficient and reliable manner and in accordance with corporate policies and all applicable laws, regulations, licenses and other requirements, all required business-management and administrative suport services for prudently conducting the activities of the GPU Nuclear Corporation.

The Administration Division's major functions are listed below:

- Assemble, review and issue budgets on a corporate-wide basis and regularly monito and report projkects progress and expenditures against capital and O&M budgets and association work plan.

- Provide Materials Management serviceds including contracting and procurement, contract administration, warehousing and inventory control on a corporatewide basis.

- Develop and adminiter security, facilities, services and industrial safety programs directed to creating a safe, convenient and protected environment for company employees and property in accordance with corporate policies and all applicable laws, regulations, licenses and other requirements.

- Provide human resources personnel services in the areas of recruiting, indoctrination and orientation of new employees benefits administration, employee relations employee relations and retention programs.

- Negotiate and administer union contracts and grievance and arbitration processes.

- Prepare, review, coordinate and issue corporate administrative policies and procedures.

- Provide Information Management and Documentation Control services.

- Provide legal services in support of the group operations including pre-submission reviews of major purchase transactions and vendor negotiations, support litigation and arbitration or administratrive proceedings and review, as applicable, proposed corporate administrative policies and procedures.

5.3.3.1 The Fiscal/Administrative Group:

- Schedules, formats, solicits, collects, analyzes inputs for, questions variances and inconsistencies and ultimately issues annual capital and O&M budgets.

- Provides the Corporation's central interface with the GPUSC Information Services hardware and software systems and provides terminalling services as needed for access to these systems.

5.3.3.2 The Materials Management Group:

- Bids, reviews quotations, and places materials, equipment, fuels and services requirements by purchase orders and contracts at schedules responsive to projects requirements on competitive and other economically justifiable basis and on favorable terms; expedites their timely delivery and receives, inspects, warehouses and issues such items consistent with sound industrial practices and regulatory requirements and maintains inventory levels of repetitively procured items at optimum levels consistent with continuity of operations and economy of service.

5.3.3.3 The Personnel and Labor Relations Group:

- Manages the recruiting, indoctrination and orientation of new employees; provides wage and salary, career progression planning, benefits development, E.E.O., and other employee retention programs, and supporting records.

- Provides professional and bargaining unit personnel with counseling, grievances review and negotiates and administers union contracts.

5.3.3.4 The Safety, Security and Facilities Group:

- Administers industrial safety programs, security and facilities (buildings, grounds, transportation and communications) services directed to creating a safe, convenient and protected work environment. This includes:

  - Prescribing the manner and policies for administering and directing the plants' security forces to protect site facilities, personnel, and prepares, and assures compliance with Corporate and Governmental policies and regulations.

  - Prescribing the manner and frequency for periodic and regular maintenance of facility security systems.

  - Providing performance assurance via visitations, reports review and other means to measure the effectiveness of plant security policies, measures, equipment and personnel.

- Establishing policies and procedures to comply with OSHA regulations.

- Developing accident reporting procedures.

- Administering safe working conditions, surveys and membership, reporting and actioning followups.

- Assuring fire protection systems readiness.

- Developing the plant industrial safety training syllabus and assuring its implementation.

- Recommending, determining, implementing and co-administering with plant personnel, plant facilities requirements, arrangements, equipment and supplies including transportation, buildings, and communications.

5.3.3.5 The Legal Services Department:

. Provides legal services in support of various divisions operations, including reviewing regulatory filings, pre-submissions, reviews of policy and procedures, and consultations including pre-commitment purchase transactions reviews, vendor negotiations support. Also evaluates, coordinates and supports litigation, arbitration or administrative proceedings.

5.3.4 Radiological & Environmental Controls Department

The Radiological & Environmental Controls Department is responsible to establish and implement uniform radiological and environmental policies, practices and procedures required to assure safe reliable and efficient operation in accordance with corporate policies and all applicable laws, regulatins and licenses.

This Division's major functions are given below:

. Establish and maintain corporate level policies, procedures, standards and practices relating to radiological and environmental activities.

. Provide the personnel, procedures and administrative controls to implement the plant radiation and environmental protection programs.

. Provide administrative and technical guidance applicable to radiation protection, radioactive materials, respiratory protection and radiological engineering including ALARA programs and dosimetry control.

. Provide administrative and technical guidance applicable to environmental protection, environmental monitoring and NPDES.

Sections 5.2.24 through 5.2.30 describe the positions responsible for the Radiation Protection Plan activities.

MAINTENANCE AND CONSTRUCTION DIVISION

5.3.5 This Division is headed by the Vice President Maintenance & Construction. The primary responsibilities of the Divisiion are:

- Establish and monitor uniform policies, practices and procedures for all maintenance, repair and construction activities in accordance with corporate policies and all applicable laws, regulations and licenses and technical requirements.

- Carry out assigned plant modifications repair and construction activities and conduct major and specialized maintenance work in accordance with corporate policies and all applicable laws, regulations, and licenses and technical requirements.

The major function of this Division are to:

- Monitor, evaluate and assure that maintenance activities at the Generating Stations are being performed in accordance with corporate policies, procedures and good maintenance practices.

- Establish and maintain the necessary corporate level maintenance and construction procedures, standards and practices for the performance of maintenance and construction activities.

- Plan, schedule and direct plant modifications, plant construction projects and major and specialized maintenance jobs.

- Plan, schedule and direct major and special maintenance and construction activities involved in planned and forced outages.

- Develop and implement a formal Methods Improvement/Productivity Program.

- Develop preplanned methods, planning and support for forced outages.

COMMUNICATIONS DIVISION

5.3.6 This Division is headed by the Vice President Communications. The primary responsibilities of the Divisiion are:

- Establish and implement policies and programs for communications with the news media, local government, citizens groups and individuals during both normal and emergency conditions in accordance with corporate policies and applicable regulations, etc.

- Establish and implement policies and procedures which assure information of general interest to employees is disseminated fully, effectively, and in a timely manner.

The major functions of this Division are to:

- Monitor, evaluate and assure that appropriate communications with outside organizations or individuals, which are not the specific responsibility of other functional divisions, are established and maintained.

- Establish and maintain corporate level policies, procedures, standards and practices relating to internal and external communication of other functional divisions with news media, local governments, citizens groups, etc.

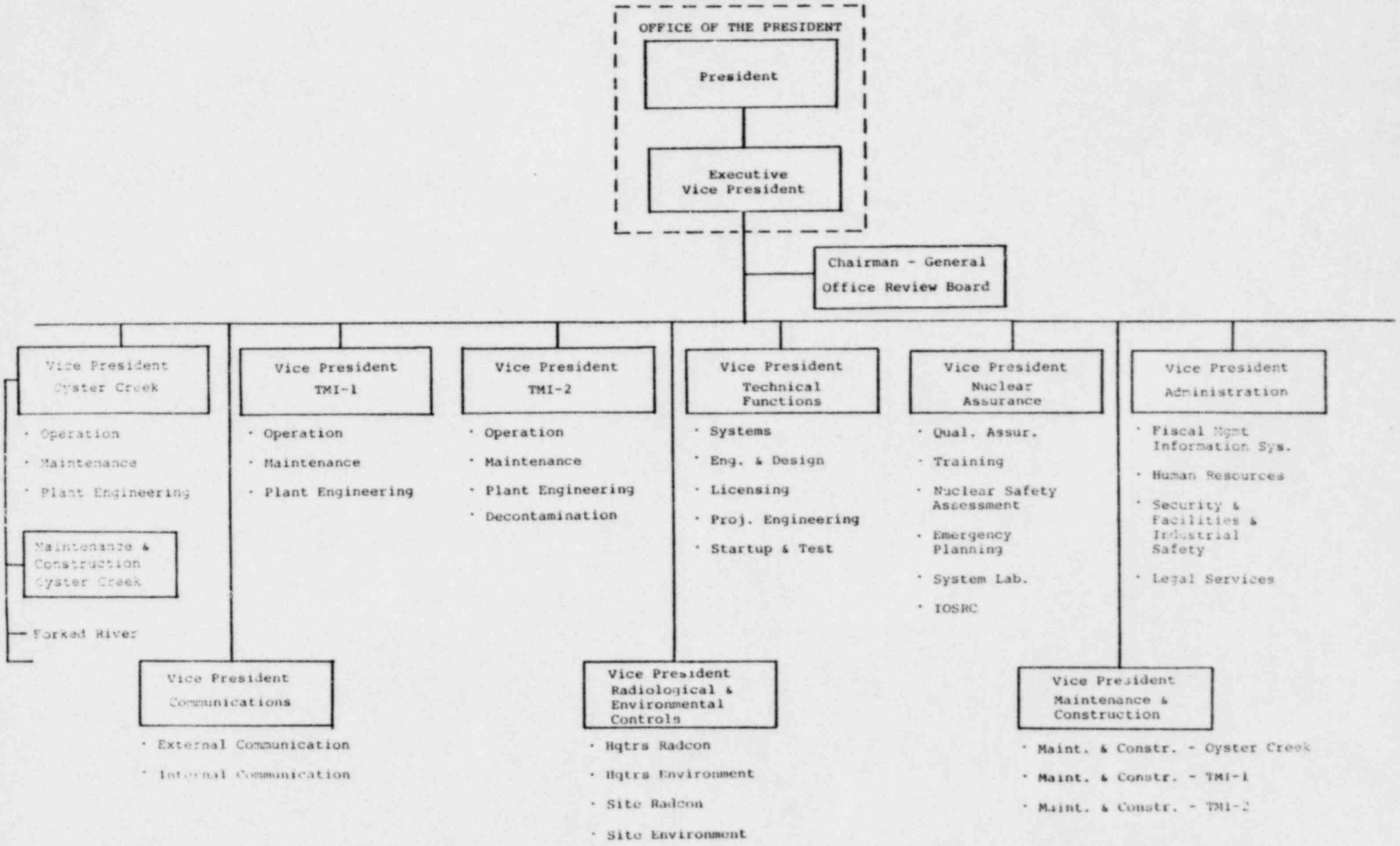
- Establish and maintain contacts within local government and citizen groups to assure effective communications between those organizations and the corporation.

- Coordinate communications activities with General Public Utilities, the GPU Service Corporation, and the Operating Companies.

- Support the development of a positive attitude on the part of local officials and the local public toward the presence, role in the community and safety of GPU Nuclear Corporation operating plants.

FIGURE 5.3-1

GPU NUCLEAR CORPORATION



5.4 SAFETY REVIEWS AND OPERATIONAL ADVISE

5.4.1 Safety Review Program

The Safety Review and Operational Advice Program for TMI-1 is conducted to assure that:

A. Activities are performed in accordance with corporate policies, the appropriate standards, policies, rules, regulations, and provisions of approved operating procedures and the NRC issued license.

B. Proposed plant, test and proc .ures changes receive the necessary review.

C. Events, that may require early reporting to the NRC, are promptly investigated and corrected as necessary to reduce the probability of recurrence.

D. Trends, which may not be apparent to the day-to-day observer, are detected.

This program complies with Section 4 of ANSI N18.7-1976, which is endorsed by Regulatory Guide 1.33.

There are three basic elements of this function which involve a total of four organizational groups. First, the Technical Functions organization provides technical review independent of the TMI-1 staff (Technical Functions has an onsite group for TMI-1). The second element is the Independent Onsite Safety Review Committee (IOSRC). There is an offsite element which includes the Nuclear Safety Assesment Department of the Nuclear Assurance Division of the General Office Review Board.

5.4.1.1 Technical Functions

The Technical Functions Division is the multi-disciplinary organization that provides technical review and support of activities being conducted at the plant site. In addition, Technical Functions is independent of the TMI-1 staff.

The coordination of all Technical Functions activities on the site and the direct interface with Operating management is provided by the Technical Functions TMI-1 Site Supervisor. His qualifications exceed the requirements contained in Section 4.7.1 of ANSI/ANS-3.1-1978 (Endorsed by Reg. Guide 1.8).

Technical Functions is responsible for independent review and technical adequacy of all facets of plant operations and modifications. They are responsible for the review of all proposed changes in procedures, proposed changes in the facility, and proposed changes in the Technical Specifications and proposed NRC License amendments. These review activities, consistent with TMI-1 technical specifications, are mandatory prior to implementation.

Technical Functions also conducts a continuing review of overall plant performance and identifies trends. Besides operating records, this review includes the areas of violations of codes, regulations, orders, Technical Specifications, license requirements, or internal procedures or instructions important to safety; significant operating abnormalities or deviations from normal and expected performance of TMI-1 equipment that affect nuclear safety; events requiring notification to the NRC and operating experience of TMI-1 and units of similar design.

The results of the various Technical Functions reviews are made directly available to the TMI-1 management organization.

While the changes from PORC to Technical Functions has not significantly changed the technical qualifications of the individuals involved, it has assured independence in that no member of the plant staff belongs to Technical Functions.

5.4.1.2 The Independent Onsite Safety Review Committee (IOSRC)

The IOSRC is a group of technical personnel, who are assigned to work at Three Mile Island, but report to the Nuclear Assurance Division. The IOSRC is headed by the Safety Review Manager described in Section 5.4.1.2.1. The committee has, or has access to, via inplace contracts with consultants, collective expertise in the areas of nuclear plant operations, nuclear engineering, chemistry and radiochemistry, metallurgy, instrumentation and control, radiological safety, mechanical and electrical engineering, quality assurance practices and administrative controls, and nondestructive testing.

The IOSRC conducts an ongoing program to evaluate the technical adequacy and clarity of procedures important to the safe operation of TMI-1 (this does not imply a pre-implementation review of procedure changes) and evaluates TMI-1 operations from a safety perspective. The IOSRC also provides a second level review of proposed changes in the facility and proposed tests or experiments, which involve a change in Technical Specifications or an unreviewed safety question as defined in 10CFR 50.59 and proposed changes in Technical Specifications or the Operating License.

The IOSRC is responsible for post implementation reviews of written safety evaluations of changes in procedures, changes in the facility and tests or experiments do not require a change in Technical Specifications or involve an unreviewed safety question as defined in 10CFR 50.59. The IOSRC also reviews violations and deviations and other events that are reported to the NRC. Their review of these Reports, and other reports of non-routine conditions, is to assure that the extent of the problem, the underlying cause, and the impact on TMI-1 has been taken or are planned.

While the IOSRC reports in the Nuclear Assurance Division, it advises the Vice President TMI-1 and the Manager TMI-1.

5.4.1.2.1 Safety Review Manager

a. Function

The Safety Review Manager (IOSRC Chairman) reports to the Manager Nuclear Safety Assessment and conducts the Committee meetings and manages the meeting records and activities.

b. Responsibility

This position is responsible for the conduct of Independent Onsite Safety Review Committee activities in accordance with the TMI-1 Technical Specifications.

c. Authority

The Chairman has the authority to conduct IOSRC meeting in accordance with Technical Specification requirements and relate the findings and formal recommendations to the Manager TMI-1 and the Vice President TMI-1.

d. Minimum Qualifications

The Chairman shall have a Bachelors Degree in an engineering or scientific field and at least five years of nuclear power plant experience.

e. Incumbent Qualifications

Education: Bachelors degree in Physics - University of Colorado - 1966.

One year graduate study - Astrophysics - University of Iowa - 1966-1967.

Experience: October 1967 - July 1969 - Idaho Nuclear Corp.
Certified Reactor Engineer at the Engineering Test Reactor (175 MWt), National Reactor Testing Station, Idaho.
Control room operator and experiment operator on shift.

July 1969 - March 1971 - Idaho Nuclear Corp.
Shift Test Engineer at ETR (same as above).
Provided liaison betwen experiment operators and Project Engineers on experiments for information exchange.

April 1971 - Sept. 1974 - GPU Service Corp.
Technical Engineer - TMI-1.
Directed the preparation of test procedures for TMI-1 and Test Program. Responsible for technical content of test procedures. Gave technical direction to 7-15 ergineers, who prepared procedures. Reviewed procedures and test results.

f. Interface

The Independent Onsite Safety Review Committee Chairman reports to the Manager Nuclear Safety Assessment and advises the TMI-1 Vice President. He also interfaces with the Onsite and Offsite Engineering Groups, and the Nuclear Regulatory Commission through the Supervision of Licensing in the execution of the Safety Review Committee responsibility set forth in the Technical Specifications.

5.4.1.3 Nuclear Safety Assessment Department (NSAD)

To NSAD is part of the Nuclear Assurance Division and is located at the Corporate Headquarters. It consists of a Manager and approximately six (6) technical personnel.

The NSAD conducts assessments of all facets of nuclear power plant design and operation and considers their potential for compromising nuclear safety, the NSAD recommends necesary improvements as a result of these assessments.

In fulfilling their mission, the NSAD performs the following functions:

- Identifies problems in nuclear plant design, operations and maintenance, which have potential for compromising nuclear safety.
- Investigates, assesses, and recommends corrective actions for functional controls required to assure nuclear safety.
- Monitors and evaluates trends in activities having potential for compromising nuclear safety.
- Provides staff support for the General Office Review Boards.
- Provides an ombudsman function for all members of the Corporation having concerns for nuclear safety.

5.4.1.4 The General Office Review Board (GORB)

The GORB is a session level overview group whose primary responsibility is to foresee potentially significant nuclear and radiation problems, and recommends to the Office of the President how they may be avoided or mitigated.

The GORB has approximately eleven members, including the Chairman and Vice Chairman. The collective expertise of the GORB includes nuclear station design, operation, materials, engineering, instruments and controls, quality assurance, training and human factor analysis, safety analysis and accident control, and radiation safety.

The membership of the GORB includes company personnel and outside consultants. The NSAD is the primary staff resource of the GORB. However, if additional resources are required, they are made available from within the company or by contract from outside organizations.

Because of the high priority placed on GORB activities, the Chairman has no other assignment than GORB activities, the Chairman has no other assignment than GORB activities for the nuclear plants in the GPU System.

The GORB reports to and gets general direction from the Office of the President. However, they have direct access to the Chief Executive Officer and the GPU Nuclear and the GPU Boards of Directors.