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| 12-1 | Station Organization Chart |


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# 12 CONDUCT OF OPERATIONS

## 12.1 ORGANIZATION AND RESPONSIBILITY

### 12.1.1 FUNCTIONAL DES RIPTION

The Production Department of Metropolitan Edison Company is responsible for all generating station operations. Centralized control over these operations rests with the Superintendent of Production with offices in the Central Division in Reading, Pennsylvania. The Superintendent of Production reports to the Chief Engineer and has access to his own staff of engineers as well as specialized consultants.

Each station functions as an independent unit with support and assistance available from the main office or its consultants, as required. Reporting directly to the Superintendent of Production, the individual station superintendent is responsible for the safe, reliable, and efficient operation of his plant.

The contemplated Three Mile Island Nuclear Station organization as shown by Figure 12-1 will consist of approximately 67 full-time employees functioning in three main groups; Operation, Maintenance, and Technical Support.

The normal operating shift as non contemplated will consist of one Shift Foreman, two Reactor Control Room Operators, and two Nuclear Plant Auxiliary Operators. The Shift Foreman will report to the Supervisor of Operations.

The maintenance force will consist of approximately 21 men experienced in mechanical, electrical, and instrument-control maintenance of a large steam-electric generating stations and/or nuclear stations, under a Supervisor of Maintenance. This number of men will be adequate for normal maintenance, but will be supplemented by additional competent maintenance personnel from other Met-Ed power stations or outside contractors for large conventional maintenance jobs such as turbine generator inspections

The Technical Support Group will consist of a Station Engineer and a staff of approximately seven engineers and technicians who will function in the areas of reactor physics, conventional chemistry, radiochemistry, radiological protection, plus overall reactor coolant system and station performance.

The initial startup, including initial core loading, initial criticality, approach to full power commercial operation, and acceptance tests will be performed by the regular Three Mile Island Nuclear Station plant staff, under the direction of the Met-Ed Production Department, with assistance from B&W and Gilbert Associates, Inc., as needed. For fuel loading, initial criticality, and initial testing, cold (pre-critical) Senior Operator Licenses will be obtained for all designated supervisory personnel as shown on Figure 12-1. After an initial operating period sufficient for necessary training, operator Licenses will be obtained for all personnel requiring them, as shown on Figure 12-1. The personnel assigned to the station and their organization will be essentially the same for both startup and regular operation, except that additional personnel may be assigned to the station for training.

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12.1.2 QUALIFICATIONS

Due to Met-Ed's participation in the operation of the Saxton Nuclear Experimental Corporation (SNEC) reactor plant at Saxton, Pennsylvania, a large number of supervisory positions at the Three Mile Island Nuclear Station will be filled with men who have extensive operating and maintenance experience in an operating nuclear power station. Others will have many years experience in conventional stations, and will be given special nuclear training. Section 12.2 gives the details of this training program and methods for qualifying station personnel. The Station Organization Chart (Figure 12-1) shows established qualifications by positions.

Several Metropolitan Edison Company graduate engineers have had extensive training in the engineering and operation of nuclear power stations. Two of them are presently assigned as Project Manager and Nuclear Project Engineer, respectively, at the Oyster Creek Nuclear Reactor project. Prior to this, these men had completed courses at the Oak Ridge National Laboratory and the Argonne National Laboratories and had served as General Manager and Nuclear Project Engineer, respectively, for the Saxton Nuclear Reactor project.Saxton Nuclear Reactor project.

12.1.3 ORGANIZATION DIAGRAM

A diagram showing the organization of Three Mile Island Nuclear Station is included as Figure 12-1. For a description of the organization, see 12.1.1. The lines of responsibility for control and review of operations are discussed in Section 12.5.

12.2 TRAINING

12.2.1 STATION STAFF

Met-Ed engineering personnel have engaged in technical and economic feasibility studies involving nuclear reactors, and have contributed several technical papers on reactor operation to various technical and professional societies. Met-Ed engineering personnel are presently serving on the Safety Committee for the Saxton Nuclear Experimental Corporation (SNEC) and on the Nuclear Task Force for the Prime Movers Committee of the Edison Electric Institute. Other engineering personnel have taken short courses, attended seminars, and visited nuclear installations in order to increase their knowledge of the nuclear power field.

In addition, Met-Ed, through its part ownership and participation in the Saxton Nuclear Experimental Corporation (SNEC) reactor at Saxton, Pennsylvania, has provided manpower required for many phases of operation and maintenance of the reactor facility. At present, a total of nine Met-Ed personnel are assigned to Saxton on a full time basis. The amount of time accumulated at Saxton by these individuals presently ranges between one and seven years, and the group includes two graduate engineers, plus technicians, and licensed reactor operators. The two graduate engineers are presently serving as Supervisor-Reactor Plant Services and Supervisor of Operations and Tests, and each has a Senior Reactor Operator's License. It is anticipated that they plus the remainder

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of the Met-Ed personnel at Saxton, will form a highly experienced nucleus for the supervisory staff at Three Mile Island Nuclear Station.

There are additional graduate engineers, engineering associates, and supervisory personnel with long term experience in conventional station operation and maintenance currently assigned to other Met-Ed facilities, and it is anticipated that the remainder of the supervisory staff will be drawn from this group.

The program for training the Three Mile Island Nuclear Station staff is designed to meet the needs of each man chosen, depending upon background, previous training, and job assignment. Initially, formal training will be given to the station supervisory staff prior to arrival at the Three Mile Island Nuclear Station site. The supervisory staff will then serve as instructors at the site for the training program to be given to non-supervisory personnel. The initial training program will be divided into five phases of activity. These are: (a) Basic Fundamental Theory; (b) Nuclear Power Station Training Program; (c) Three Mile Island Nuclear Station Design; (d) On the Job Training and Station Checkout; and (e) Operational Training Following Initial Criticality. These are described as follows:

a. Basic Fundamental Theory

All supervisory personnel who have not had extensive nuclear power station experience will begin their training with a basic course covering the fundamental laws of physics, nuclear theory, nuclear instrumentation, health physics, and nuclear power station theory. These courses will be taught by Met-Ed engineering personnel, with assistance as needed from nearby universities and Babcock and Wilcox. Courses will run for approximately six months.

b. Nuclear Power Station Training Program

All supervisory personnel who have not had extensive and recent operating and maintenance experience in a nuclear power station will be sent to a nuclear station for extensive training in plant operation and maintenance. This training will be accomplished at Saxton or some other operating PWR facility. This phase of the program will run for approximately six months and will be administered by Met-Ed personnel.

At the conclusion on parts (a) and (b) of the training program, it is anticipated that all supervisory personnel who will be licensed for the Three Mile Island Nuclear Station, as shown on Figure 12-1, will be qualified to take examinations for Operator Licenses for the operating reactor facility on which they have been trained.

c. Three Mile Island Nuclear Station Design

The Three Mile Island Nuclear Station supervisory staff will participate in a station design training program organized and taught by Babcock and Wilcox at their facilities. This phase of the training program will run for approximately two months



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and will include the following:

1. The Reactor Coolant and Auxiliary Systems Design Course presents the functions, fluid conditions, and descriptions of the primary and auxiliary systems. Preliminary operating procedures, safety considerations, and instrumentation are an integral part of the course.

2. The Nuclear Instrumentation and Control Course includes description of the system, detector theory, basic functions of components, station control theory, and preliminary operating procedures.

3. The Mechanisms Course includes a physical and operational description of the control rod drive assemblies, their mounting, and positions. Description of the reactor vessel head closure and refueling equipment is covered.

4. The Health Physics Course includes instruction in measurement of radiation, working techniques with radioactive material and equipment, decontamination methods and precautions. Radiation monitoring systems are discussed.

5. The Chemistry Course presents the basic concepts of water chemistry application to the reactor system. Radiochemistry measurements, precautions, sampling, and selected chemical analyses are included.

6. The Reactor Protection Course presents both general and specific safety aspects of reactors. The history of accidents that have occurred is presented. Special safety considerations of the reactor include the accident analysis and emergency procedures. Technical specifications and emergency procedures are explained. Organizational relationships and the functions of regulatory aspects are presented. Emphasis is placed on developing safety attitudes.

All supervisory personnel and the entire station non-supervisory staff, except for certain maintenance, clerical, and custodial personnel in lower classifications, will be assembled at the site sixteen months prior to fuel loading for phases (d) and (E) of the training program. Supervisory personnel will serve as instructors to train the non-supervisory staff in basic fundamental theory, Three Mile Island Nuclear Station design, and station operation and maintenance This portion of the training program will be divided into two areas of activity as follows:

d. <u>On-The-Job Training Plus Station Check-Out</u>

This phase of the training program will be organized to thoroughly train the non-supervisory personnel in the theory, design, and pre-critical operation of the Three Mile Island plant, and to obtain the maximum participation by all personnel in the on-site activities, including installation of equipment, testing, and start-up. Supervisory and non-supervisory personnel will participate in the following areas of station check-out:

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1. Developing and writing instruction manuals and test programs.

2. Testing of individual equipment and systems.

3. Developing and writing detailed test, operating, refueling, and emergency procedures.

4. Preparation of maintenance procedures and participation in maintenance work.

This phase of the training program will be administered by Met-Ed personnel, with assistance from Babcock and Wilcox.

Approximately two months before fuel loading, all supervisory personnel scheduled to obtain cold licenses for participation in fuel loading and initial operation of the reactor will take license examinations. All non-supervisory personnel scheduled to be licensed will take only the written examination at this time. This will be preceded by a short review course, conducted by Babcock and Wilcox to prepare personnel for the examination through a review of theory and a study of the latest developments in the station design.

e. Operational Training Following Initial Criticality

This phase of the training program will be on a continuing basis throughout the life of the station, and will be conducted by Met-Ed personnel at the Three Mile Island Nuclear Station technical assistance supplied as required from outside sources. The primary emphas during the first few months following fuel loading and initial criticality will be on training and qualifying remaining personnel for required licenses. Thereafter, the purpose of this phase will be to instruct and qualify newly assigned station personnel and to insu that existing station personnel are completely familiar with recent developments or changes in the station design.

12.2.2 REPLACEMENT PERSONNEL

During the normal operation of Three Mile Island Nuclear Station, extra engineering, operating, and maintenance personnel may be assigned to the station specifically for training purposes, since it is expected that our Company will continue to consider nuclear units for the future. These men, as needed, will be drawn from other Met-Ed facilities or employed directly into the organization at the station. The training program for replacement personnel will cover the same general material and follow the fundamental program outlined for training the original personnel and will be presented by the station staff with outside assistance as required.

12.2.3 ON-THE-JOB TRAINING

This section is covered by phases (d) and (e) of the training program under 12.2.1.

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12.2.4 EMERGENCY DRILLS

As part of the overall program of developing station procedures, an emergency plan will be developed. The plan will cover emergencies such as fire, medical injury and illness, radiation, and contamination accidents, and other conditio that may result from nuclear and non-nuclear accidents. Insofar as possible, the station will be self-sufficient in handling emergency conditions, but outside agencies such as Police and Fire Departments, the AEC, etc., will be called upon as needed.

All station personnel will be thoroughly familiar with the emergency plan, and practice drills will be held as necessary for training. All outside agencies included in the plan will be informed of their expected role in an emergency.

12.3 WRITTEN PROCEDURES

Written procedures will be prepared and periodically reviewed and revised as necessary to cover both normal and emergency operating conditions. These procedures will include recommended actions for all credible abnormal situations. The emergency procedures will include those applicable to accidents which might conceivably result in a radioactive release beyond the site boundar

12.4 RECORDS

Met-Ed's regular system of record keeping, with amendments and additions as necessary, will be utilized at the Three Mile Island Nuclear Station. These records include operating reports, maintenance files, log books, and log sheets and other necessary records to verify safe and efficient plant operation.

12.5 ADMINISTRATIVE CONTROL

Administrative controls will be established to assure that all operations, maintenance procedures, tests, and emergencies are handled in accordance with written procedures which have been reviewed and approved by established channels. The Station Superintendent has the responsibility and authority to operate the station within the limits of the facility license.

A daily review of operating logs, charts, and other data will be made by engineers and technicians in the Three Mile Island Technical Support Group in order to insure that the station is being operated in a safe and efficient manner.

In addition to these reviews, periodic station staff meetings will be held to keep all operating personnel advised of current conditions in the station.

Administrative control over review, audit of operations, and approval and authorization of changes will be accomplished as follows:

General - The review, audit, approval and authorization functions will be performed by a Plant Operations Review Committee and a General Office Review Board. The Plant Operations Review Committee will be responsible for review of changes to operating and maintenance procedures, review of proposed changes to plant systems, and review of abnormal operations. This committee will keep the General Office Review Board advised of any violations of the technical specifications, and will request approval of the General Office Review Board for recommended changes to the technical specifications or licenses, and changes in procedures or plant systems that have potential safety or technical specifications implications. The General Office Review Board will be responsible for periodic monitoring of plant operation from the standpoint of compliance with licenses and will review and take action on all requests of recommendations of the plant review committee.

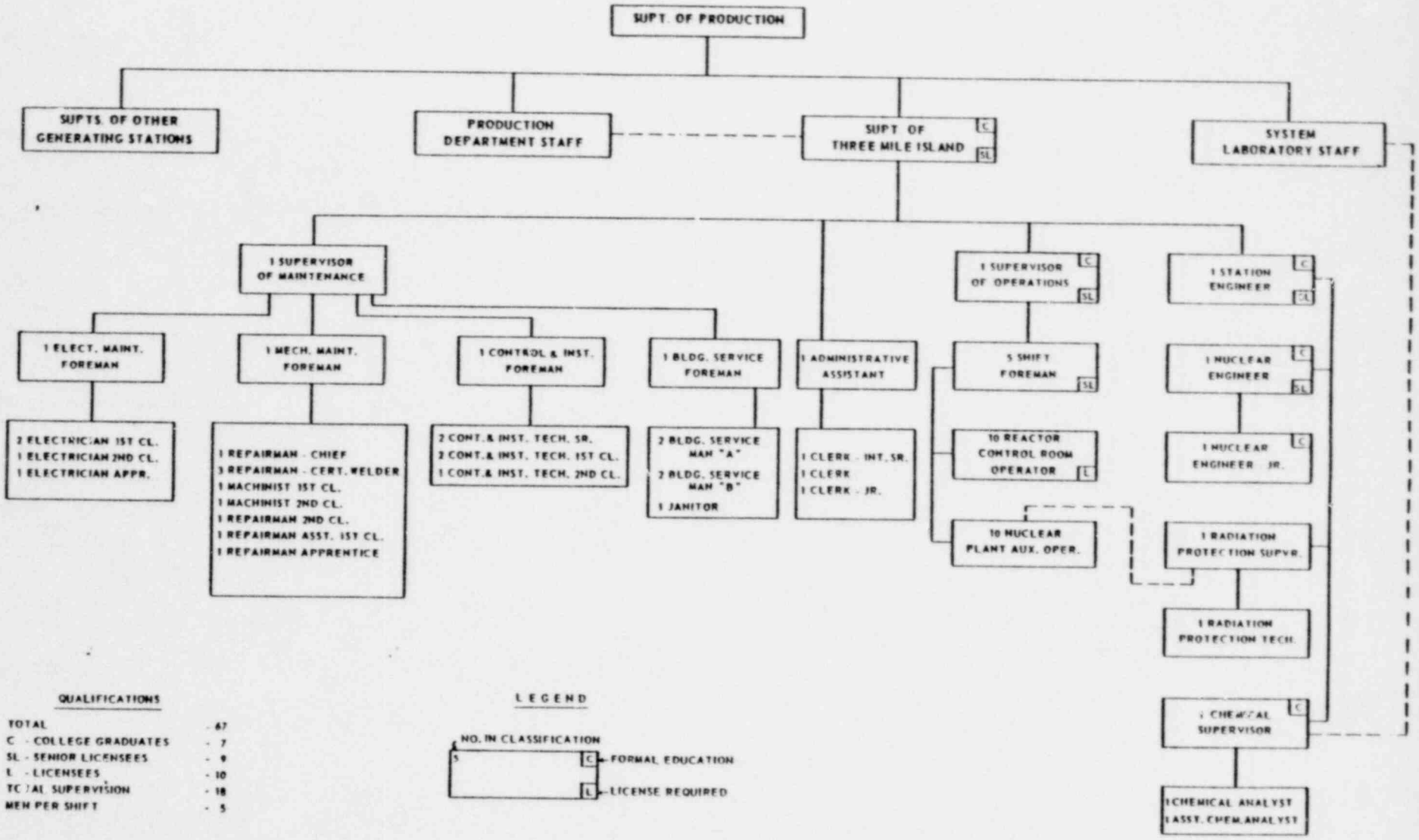
Plant Operations Review Committee - The Plant Operations Review Committee will be composed of the Station Superintendent, Supervisor of Operations, Station Engineer, Supervisor of Maintenance, and two members of the General Office Review Board or their designees. This Committee will review all procedures, emergency plans, tests, experiments, incidents and will periodically review plant operations with particular emphasis on safety and compliance with all licenses and permits.

This committee will also review proposed changes in procedures and proposed changes to plant systems that could affect plant safety and will make recommendations to the General Office Review Board concerning proposed changes, tests, or experiments that have significant safety implications or which involve the technical specifications or licenses. Records of all Plant Operations Review Committee meetings will be maintained at the plant and copies forwarded to the chairman of the General Office Review Board and others who he might designate.

General Office Review Board

The General Office Review Board will be composed of responsible supervisory or professional personnel (or their designees) that are not generally responsible for day-to-day operation of the plant. This board may call in consultants or vendor representatives as required. The Board will review proposed changes in plant systems, tests, and experiments referred to it by the Plant Operations Review Committee. The General Office Review Board may also select items for review based on reports received or audit inspections made. After review of items are completed, the Board will advise the Plant Operations Review Committee of action taken and where necessary will initiate the necessary applications for AEC authorization or approval.

The General Office Review Board will also be charged with having periodic audits made of plant operations to assure safe and efficient operation and compliance with all licenses and permits. In performing this function, this Board will assign the audit task to a qualified person or persons having no direct line responsibility for execution of day-to-day operation of the plant.




QUALIFICATIONS

| | |
|---|---|
| TOTAL | - 67 |
| C - COLLEGE GRADUATES | - 7 |
| SL - SENIOR LICENSEES | - 9 |
| L - LICENSEES | - 10 |
| TOTAL SUPERVISION | - 18 |
| MEN PER SHIFT | - 5 |

LEGEND

NO. IN CLASSIFICATION
5 — C — FORMAL EDUCATION
L — LICENSE REQUIRED

*NOTE: AUX. OPERS. PROVIDE RAD. MONITORING AND PROTECTION SERVICES.

— — — INDICATES TECHNICAL LIAISON

STATION ORGANIZATION CHART

Metropolitan Edison

FIGURE 12-1

THREE MILE ISLAND NUCLEAR STATION

AMEND. 1 (7-21-67)

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