THREE MILE ISLAND NUCLEAR STATION

UNIT I

RADIATION PROTECTION PLAN

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TABLE OF CONTENTS

Article 1 - Foundation for the TMI-I Radiological Controls Program

This document, the Three Mile Island Unit I Radiation Protection Plan, sets forth the philosophies and basic policies of Metropolitan Edison Company and General Public Utilities Corporation concerning their TMI-I Radiological Controls Program. These philosophies and policies are based on and stem from the regulations of the Nuclear Regulatory Commission (NRC) as contained in Title 10 of the Code of Federal Regulations, Parts 19, 20, 50, and 71, and appropriate Regulatory Guides. The TMI-I Radiation Protection Plan is based on these references, therefore they are not repeated throughout the remainder of this document.

Specific details as to how the TMI-I Radiation Protection Plan is implemented shall be promulgated in the TMI-I Radiological Controls Procedures Manual (RCPM), further references to the TMI-I RCPM are not repeated throughout this document. The TMI-I RCPM will consist of revisions of procedures which existed in the previous HPP 1600 and 1700 series with additional procedures deemed necessary. The procedures have direct applicability only to TMI Unit I. This TMI-I Radiological Controls Plan is the first part of the TMI-I RCPM. Requirements governing release of radioactive liquids and gases to the environment and the disposal of solid radioactive waste are addressed in Unit I Technical Specifications.

Verbatim compliance with the TMI-I RCPM is mandatory. In the event a procedure cannot be followed exactly, work under that procedure shall be stopped and shall not commence again until the procedure has been corrected.

This TMI-I Radiation Protection Plan and the new TMI-I RCPM are being written primarily to increase the effectiveness of The Radiological Control Program at TMI Unit I. The TMI-I Radiological Controls Program is to be fully integrated into each and every phase of the activities at TMI Unit I. The TMI-I Radiological Controls Program when carried out as specified will assure

that the activities of Unit I will be completed with personnel who work at the site incurring radiation exposure as low as can reasonably be achieved.

In order to meet this objective, the program must be carried out by each person involved in the TMI-I activities. There is no element, group, or person involved in the TMI-I activity who does not have some degree of responsibility for the Radiological Controls Program. Failure of any person to recognize this responsibility or to comply with issued procedures will not be tolerated. A radiologically safe activity will be achieved if each individual carries out his or her responsibility.

The performance of each manager and supervisor must demonstrate support for the commitment by top management of General Public Utilities Corporation and Metropolitan Edison Company to a strong, effective Radiological Controls Program.

Article 2 - Responsibilities of Workers

Although personnel specially trained in radiological controls normally oversee radioactive work, each individual involved in this work must constantly remain aware of the potential radiological problems. Each individual's actions directly affect his exposure, contamination, and overall radiological problems associated with the work. The following rules shall be followed by individuals to minimize radiological problems:

1. Obey promptly "stop-work" and "evacuate" orders of radiological control personnel.
2. Obey posted, oral and written radiological control instructions, including instructions on Radiation Work Permits.
3. Wear TLD and self reading dosimeter where required by signs or by radiological control personnel.
4. Keep track of personal radiation exposure status and avoid exceeding exposure limits.
5. Remain in as low a radiation area as practicable to accomplish work.
6. Do not loiter in radiation areas.
7. Do not smoke, eat, or chew in contaminated areas.
8. Wear anticontamination clothing and respiratory protection properly and wherever required by signs or radiological control personnel.
9. Remove anticontamination clothing and respiratory protection properly to minimize spread of contamination.
10. Frisk or be frisked for contamination when leaving a contaminated area or a radiological control point.
11. For a known or possible radioactive spill, minimize its spread and notify radiological control personnel promptly.
12. Do not unnecessarily touch a contaminated surface or allow clothing, tools, or other equipment to do so.

13. Place contaminated tools, equipment and solid waste on disposable surfaces (for example, sheet plastic) when not in use and inside plastic bags when work is finished.
14. Limit the amount of material that has to be decontaminated or disposed of as radioactive waste.
15. Report the presence of open wounds to radiological control and medical personnel prior to work in areas where radioactive contamination exists and immediately if a wound occurs while in such an area.
16. Assure a mentally alert and physically sound condition for performing assigned work.
17. Ensure that your activities do not create radiological problems for others and be alert for the possibilities that the activities of others may change the radiological conditions to which you are exposed.

Article 3 - Audits, Reviews and Reports on the TMI-1 Radiological Controls Program

As indicated in Article 2, each individual is responsible for maintaining his or her radiation exposure as low as reasonably achievable while completing the scope of work they are required to perform. Each will be required to comply with the applicable procedures of the TMI-1 RCPM and the specific radiological controls prescribed for work in which they are engaged.

In order to ensure that these requirements are being met and to assist all site personnel in understanding and complying with these requirements, the following audit and review procedures shall be used:

1. Radiological control technicians shall monitor and aid the performance of each individual insofar as radiological work practices are concerned.
2. The radiological engineering staff shall review on a regular basis the performance of the radiological control technicians. This review includes shift coverage on those jobs which are considered likely to have a high potential for radiological difficulties.
3. Radiological audits shall be conducted throughout the Radiological Controls Program on a continuous basis. This audit function shall report directly to the highest level of management in the TMI-1 organization and shall be outside the Radiological Controls Department. A written report of the findings of this audit shall be prepared and issued at least monthly.
4. Periodic technical reviews shall be conducted of the TMI-1 Radiological Controls Program by technically qualified persons from outside the Radiological Controls Department. These reviews shall cover everything in the TMI-1 Radiation Protection Plan and all procedures in the TMI-1 RCPM on at least an annual basis.

5. The Plant Operations Review Committee shall review and comment on the TMI-1 Radiation Protection Plan and any changes thereto. They also have the responsibility to review those procedures requested by the Manager Radiological Controls.

6. Periodically, the services of an outside consultant will be retained to provide evaluation and guidance on ways to improve the TMI-1 Radiological Controls Program.

7. In addition to these reviews and audits, a system shall be employed to identify radiological control deficiencies. A radiological control deficiency is defined as either a violation of an established procedure or a practice which could and should be improved. Such deficiencies are recorded in a Radiological Deficiency Report. This system shall be specified in the TMI-1 RCPM embodying the following concepts. A Radiological Deficiency Report may be initiated by any individual who observes a deviation from good radiological practices. These reports shall be evaluated by Radiological Engineering for desirable or necessary corrective action. The purpose of this system is to identify all deficiencies, regardless of how small or inconsequential, correction of which will result in an improved Radiological Controls Program. Radiological Engineering shall prepare a monthly report summarizing the Radiological Deficiency Report findings and corrective action taken.

8. The Nuclear Regulatory Commission (NRC) also inspects and reviews the TMI-1 Radiological Controls Program. The TMI-1 Radiation Protection Plan and any changes thereto shall be submitted to the NRC for approval.

9. In the event all the preceding measures fail to prevent a radiological incident, an investigation shall be conducted to determine the causes of the incident and to determine the corrective actions and improvements needed.

Article 4 - Radiological Control Training

1. Periodic radiological control training shall be given to ensure each person understands the radiological conditions to which he is exposed, understands his responsibility to minimize his own exposure to radiation, and understands his own responsibilities for complying with radiological control procedures. Personnel occupationally exposed to radiation shall receive instruction on the effects of radiation and the risks associated with radiation exposure.

2. General radiological indoctrination shall be given to those not directly involved with radiation so that they understand not to enter areas requiring TLDs and not to cross radiation barriers. The indoctrination shall include explanation of the radiological environment in which they work.

3. Radiological control training shall be given to personnel who require TLDs. These personnel shall be required to pass a written examination, and they shall requalify by written examination at least annually.

4. In addition to the training and written examinations of paragraph 3, those who require access to areas controlled by Radiation Work Permits shall receive more extensive training and shall be required to pass a radiological examination on their practical abilities, including use of dosimetry, frisking, anticontamination clothing, respirators, and response to unusual situations. Retraining, and both written and practical examinations shall be conducted at least annually. In addition spot checks shall be made that they retain the required

knowledge during the period between examinations. Special briefings and extra training including use of mockups where applicable, shall be conducted for work involving higher than usual exposures to radiation and radioactivity.

5. Radiological control technicians and their foremen shall receive theoretical and practical training and training for unusual situations. They shall pass both written and oral examinations, in which the passing grade for foremen shall be higher than the passing grade for technicians. Periodic practical drills and oral drills shall be required for each technician and foreman. Annual requalification shall be required including both written and oral examinations. Radiological control technician assistants shall perform specific functions under direction of a qualified technician or foreman and only after being qualified for the specific function.

Article 5 - Control of External Exposure

Control of radiation exposure is based on the assumption that any exposure no matter how small involves some risk; however, exposure within the accepted limits represents a risk small compared with normal hazards of life. Therefore the policy of Metropolitan Edison Company and General Public Utilities Corporation is to maintain exposures to individuals and total manrems as low as reasonably achievable (ALARA). Line management from all departments as well as each individual worker shall take an active role in radiation exposure reduction.

To aid in exposure reduction, administrative radiation exposure control levels shall be established. Radiation exposure goals shall be established for each outage and for each year. Work involving radiation exposure shall be preplanned. Major exposure jobs shall require that radiological controls be incorporated into the work procedure and that pre-job briefing and rehearsals be conducted prior to commencing work. Work involving significant exposure to radiation shall be controlled by a Radiation Work Permit.

Restricted areas used to control personnel access to radiation and radioactive materials shall be defined, access controlled, and posted in accordance with 10 CFR 20.203 with the following modifications:

1. Each High Radiation Area shall be barricaded and conspicuously posted as a High Radiation Area, and personnel desiring entrance shall obtain a Radiation Work Permit (RWP). Any individual entering a High Radiation Area shall (a) use a dose rate monitoring device or (b) use a radiation dose rate integrating device which alarms at a preset dose level, or (c) assure that a radiological control technician provides periodic radiation surveillance with a dose rate monitoring instrument.

2. Any area accessible to personnel where a major portion of the body could receive in any one hour a dose in excess of one thousand mrem, shall be locked to prevent unauthorized entry. The keys to these locked barricades shall be maintained under the administrative control of the Radiological Controls Foreman on duty in accordance with the RCPM.

Radiological Controls personnel shall be exempt from the RWP issuance requirements during the performance of their assigned radiation protection duties providing they are following radiological control procedures for entry into High Radiation Areas.

To evaluate radiological conditions, radiation surveys shall be conducted for air activity, removable surface contamination and external radiation at regular intervals. Unsusual conditions detected in the performance of either a routine or special survey shall immediately be brought to the attention of Radiological Controls Management. The instruments required to conduct the surveys shall be maintained and periodically calibrated to assure a consistent, reliable and predictable response to radiation levels. Records of surveys shall be maintained on file.

Article 6 - Control of Internal Exposure

The policy of Metropolitan Edison Company and General Public Utilities Corporation is not to have any significant internal exposure to personnel from radioactivity associated with Three Mile Island Unit 1. For personnel exposed to radioactivity during their work, this means that no one should receive from internal radioactivity more than one tenth of their permitted annual radiation exposure.

Controls in other parts of this TMI-1 Radiation Protection Plan to minimize internal radioactivity, such as control of surface contamination and control of wounds, are not repeated in this article. The following controls are to minimize internal exposure from airborne radioactivity:

1. Engineering controls and controls on personnel access shall be applied to the maximum extent practicable so that radioactive work does not increase the amounts of airborne radioactivity inhaled. When no other controls are practicable, respirators shall be used. Those who may need to use respirators shall be medically qualified, trained, tested for respirator efficiency, and requalified in this respirator program at least annually.
2. Airborne radioactivity shall be measured regularly in areas where personnel may be exposed. Continuous monitoring shall be performed to supplement periodic measurements during work which has the potential to cause a worker to receive measurable internal radioactivity.

Internal radioactivity shall be measured at least annually in each person who works in an area requiring a Radiation Work Permit; this includes each person who wears respiratory protection. Internal radioactivity shall be measured promptly in each person who receives radioactive contamination on his

skin, and in each person who is suspected of inhali: dioactivity
to cause measurable internal radioactivity. Each me. ternal
radioactivity above a level near background shall be termine
the cause and to assist in minimizing internal exposu

Article 7 - Control of Radioactive Contamination

Radioactive surface contamination shall be controlled in order to minimize possible inhalation or ingestion of radioactivity and to minimize buildup of radioactivity in the environment. Measures to contain radioactivity and to minimize the number and extent of areas contaminated shall be taken in order to minimize personnel radiation exposure, to simplify subsequent decontamination, and to minimize the need to rely on anticontamination clothing.

Emphasis in planning, training and working shall be placed on minimizing the numbers of occurrences and amounts of radioactivity involved in occurrences in which radioactive surface contamination exceeds the limits of the TMI-1 RCPM on a person's skin or in areas not controlled for radioactive surface contamination. Each such occurrence shall be reviewed in detail to determine how to correct deficiencies and improve control of radioactivity.

Article 8 - Control of Radioactive Materials

A radioactive material control system shall be established to ensure radioactive material is not lost or misplaced in a location where personnel could unknowingly be exposed and to prevent the uncontrolled spread of radioactivity to areas where the public might be affected. This system shall include the following requirements:

1. The number of areas in which radioactive materials are stored shall be minimized.
2. Any new radioactive material storage area shall be approved before use by the Manager Radiological Controls.
3. The numbers of radioactive items and the amount of radioactivity in storage shall be minimized.
4. Radioactive items shall be identified as radioactive before removing them from a restricted area.
5. Radioactive materials removed from the Protected Security Area or removed from a restricted area outside the Protected Security Area shall be controlled in accordance with an accountability procedure which ensures the materials are not lost or improperly handled during transfer. This accountability procedure shall require periodic inventory of radioactive materials which remain outside such areas.
6. Each incoming or outgoing shipment of radioactive material shall be handled in strict compliance with detailed written procedures.

Each case in which radioactive material is lost or unaccounted for shall be reviewed in detail to determine the potential radiation exposure personnel might unknowingly receive, to correct deficiencies, and to improve control of radioactive materials.

Article 9 - Organization for Radiological Controls

A radiological control program cannot be strong and effective if left solely to the Radiological Controls Department. Each worker and supervisor has responsibility for radiological control; consequently, the organization for the entire Three Mile Island Unit 1 represents the organization for radiological control.

However the Manager Radiological Controls is responsible for ensuring that a high quality radiological controls program is established and maintained. To assist him, a Radiological Controls Department is organized as shown in Figure 1.

At times when demands upon the Radiological Control Department are sufficiently heavy to require a temporary increase in staff qualified contractor personnel will be used. These personnel will be fully integrated into the department under the direction of the Manager - Radiological Controls.

Qualifications for the key radiological managers in NRC Regulatory Guide 1.8, Rev. 1-R, (1975) will be met as far as practicable. Where the combination of strong manager and experience in radiological controls cannot practicably be obtained in the same person, the combination of the qualifications of the Manager - Radiological Controls and his supervisors will meet Regulatory Guide 1.8, Rev 1-R (1975).

One portion of the TMI-1 radiological controls program is the ALARA program for personnel radiation exposures to be as low as reasonably achievable. To accomplish this each individual who provides work instructions, procedures and directions has to have constant awareness of radiological conditions as part of his assignment. Thus, most efforts to reduce radiation exposure are performed by individuals other than those in the Radiological Controls Department. The overall coordination of the TMI-1 ALARA program, however, is assigned to Radiological Engineering in the Radiological Controls Department.

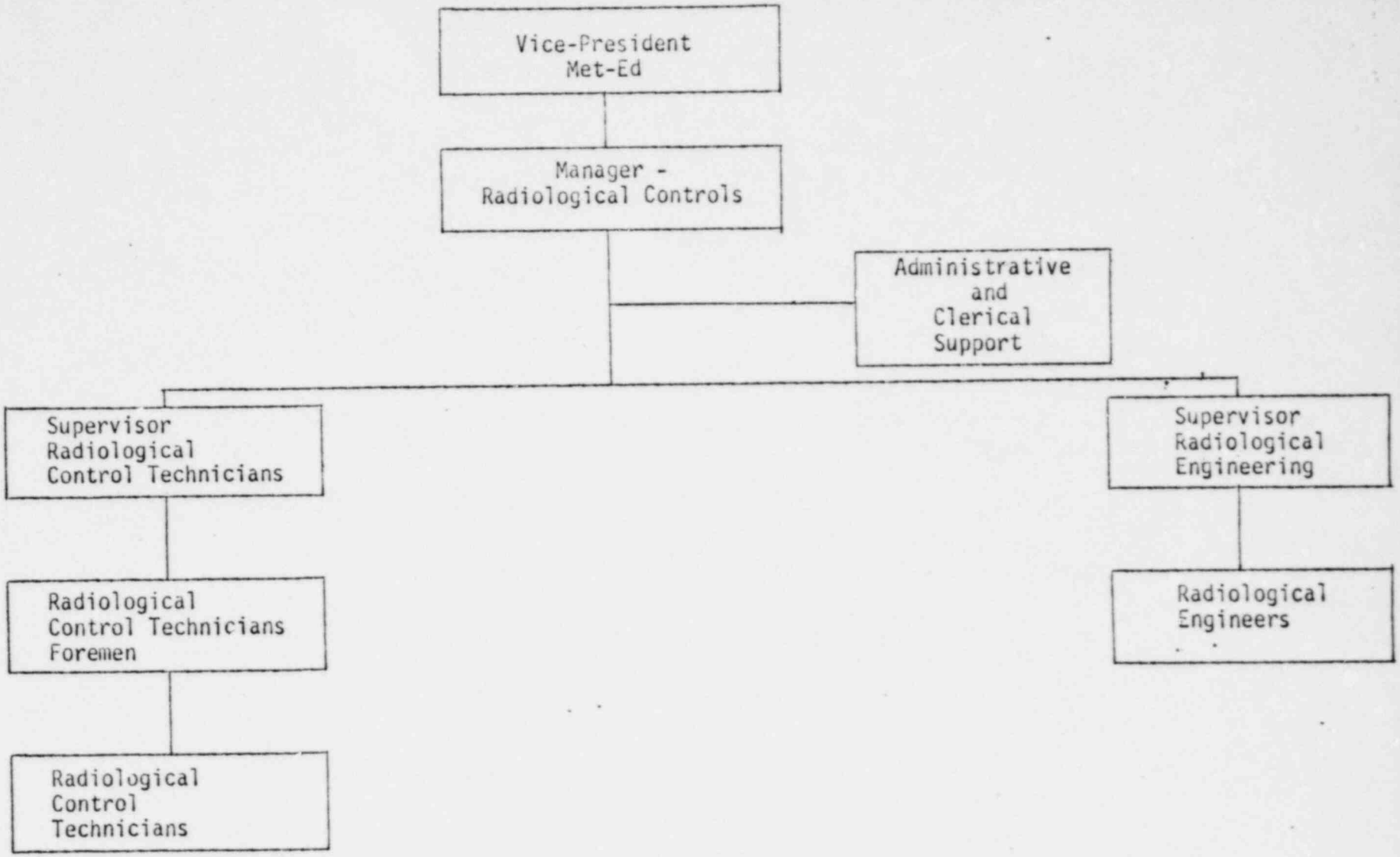

Figure 1 TMI-I Radiological Controls Department Organization