GPU Nuclear

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US Nuclear Regulatory Commission
Washington, DC 20555
Attn: Document Control Desk

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating Licensing No. DPR-73
Docket No. 50-320
Proposed TMI-2 POL Additional Submittals

Dear Sir:

The proposed Three Mile Island Unit 2 (TMI-2) Possession Only License (POL) (Reference NRC letter dated February 20, 1992) included a license condition 2.F. entitled "Additional Submittals Prior to Post-Defueling Monitored Storage." The license condition requires GPU Nuclear to submit and implement a site Flood Protection Plan, a site Radiation Protection Plan, an Offsite Dose Calculation Manual (ODCM), a Post-Defueling Monitored Storage (PDMS) Fire Protection Program Evaluation (FPPE), a PDMS Quality Assurance Plan (QAP), and a Radiological Environmental Monitoring Plan (REMP).

The PDMS QAP has been submitted and approved by the NRC (Reference NRC letter Michael T. Masnik, NRR, to Dr. Robert L. Long, "Approval of Post-Defueling Monitored Storage Quality Assurance Plan for TMI-2," dated June 3, 1992). The PDMS QAP will be implemented upon entry into PDMS. Minor revisions to the previously submitted ODCM and FPPE will be necessary prior to entry into PDMS. Proposed changes to those documents will be submitted for NRC review just prior to entry into PDMS and will be implemented upon entry into PDMS.

The site Radiation Protection Plan and the REMP are attached for NRC review; they are currently being implemented at the TMI site with no major changes planned.

Ltr Encl
1 1

A001
1/1 Add: NRR/DREP/RRPB

Although there is no site Flood Protection Plan, per se, the current Recovery Technical Specifications and the PDMS Safety Analysis Report (SAR) requirements related to floods are incorporated in the attached site Flood Emergency Procedure (EP). The Flood EP is being submitted for information only and will not be considered a license basis document.

Sincerely,

R. L. Long
Director, Corporate Services/TMI-2

EDS/RLL
Attachments

cc: T. T. Martin - Regional Administrator, Region I
M. T. Masnik - Project Manager, PDNP Directorate
L. H. Thonus - Project Manager, TMI Site
F. I. Young - Senior Resident Inspector, TMI

INFORMATION ONLY

GPU Nuclear | GPU Nuclear Corporate Policy and Procedure Manual | Number 1000-PLN-4010.01

Title	Revision No.
GPU NUCLEAR CORPORATION RADIATION PROTECTION PLAN	4

Applicability/Scope	Responsible Office
All GPU Nuclear Personnel	6600

			Effective Date
This document is within QA plan scope	_x_ Yes	____ No	
Safety Review Required	_x_ Yes	____ No	08/02/91

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90-002.wpd	Signature	Concurring Organizational Element	Date
Originator	D. H. Reppert	Radiological Engineer, Corp.	2/27/91
Concurred By	/s/ J. J. Barton	Director, Oyster Creek	6/22/91
	/s/ T. G. Broughton	Director, TMI-1	3/08/91
	/s/ I. R. Finfrock, Jr.	Director, Site Services	5/01/91
	/s/ J. C. DeVine, Jr.	Director, Technical Functions	5/02/91
	/s/ D. W. Myers	Director, Admin. & Finance	5/04/91
	/s/ R. L. Long	Director, Corp. Services/TMI-2	3/04/91
	/s/ T. D. Murphy	Director, Rad.'l & Envr. Controls	5/21/91
	/s/ C. Clawson	Director, Communications	5/13/91
	/s/ C. W. Comferford	Admin. Support Manager	6/26/91
	/s/ P. B. Fiedler	Director, Nuclear Assurance	5/02/91
	/s/ J. F. Wilson	Corp. Counsel & Secretary	5/30/91
Approved By	[signature]	Office of the President	7/8/91

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1.0 BASIS FOR GPU NUCLEAR RADIOLOGICAL CONTROLS PROGRAM

1.1 The GPU Nuclear Corporation (GPUNC) Radiation Protection Policy 1000-POL-4010.01 sets forth the philosophies and basic policy guidelines for the Radiological Controls Programs at TMI and Oyster Creek Nuclear Generating Stations. The GPUNC Radiation Protection Plan 1000-PLN-4010.01 implements the policy by following these objectives:

1.1.1 Minimize individual exposure to radiation and radioactive material so that the risks are consistent with those commonly accepted in our daily lives.

1.1.2 Prevent any significant internal exposure.

1.1.3 Minimize collective radiation exposure.

1.1.4 Minimize contamination of personnel, areas and equipment.

1.1.5 Minimize the production of solid radioactive waste.

1.1.6 Minimize exposure to the public.

1.2 These philosophies, policies, and objectives are based on and implement the regulations of the Nuclear Regulatory Commission (NRC) as contained in Title 10 of the Code of Federal Regulations, Parts 19, 20, 30, 50, and 71, and appropriate Regulatory Guides, specifically 1.8 Rev. 2, 8.8 Rev. 3 (1978), 8.10 Rev. 1-R (1975), 8.13 Rev. 1 (1975), and 8.15 (1976). The GPUN Radiation Protection Plan is based on these references; therefore, they are not repeated in this document.

1.3 GPUNC is committed to incorporating the philosophies and guidelines found in the Institute for Nuclear Power Operations (INPO) document "Guidelines for Radiological Protection at Nuclear Power Stations," where applicable.

1.4 Specific details as to how the GPUNC Radiation Protection Plan is implemented shall be promulgated in the plant specific Radiological Controls procedures (RCPs). These procedures shall

include those applicable areas addressed in Reg. Guide 1.33, Rev. 2 (1978), App. A, paragraph 7, and paragraphs 8a, 8b(1)(aa) and (bb), and 8b(2)(aa) and (bb). This GPUNC Radiation Protection Plan is to be used in conjunction with the RCPs.

1.5 The GPUNC Radiation Protection Plan and RCPs are written to implement and increase the effectiveness of the Radiological Controls Program. Procedures shall provide adequate guidance and specify appropriate methods or techniques to ensure that the performance of each activity is in accordance with sound radiological controls principles, and is in compliance with applicable regulatory provisions. Strict compliance with RCPs is required so that work will be done according to pre-determined work practices. If strict compliance is not possible, the work shall stop and supervision shall be consulted to resolve the problem. The RCPs shall be prepared, reviewed, approved, and controlled as described in the appropriate GPUNC Administrative procedures.

1.6 The GPUNC Radiological Controls Program is to be fully integrated into all aspects of operations at TMI-1, TMI-2 and Oyster Creek. The Radiological Controls Program when carried out as specified will assure that the operation of the GPUNC Plants will be performed in accordance with the as low as reasonably achievable (ALARA) philosophy discussed in Section 2.0.

1.7 Line management from all departments as well as each individual worker shall take an active role in radiological controls including radiation exposure and radioactive waste reduction. The performance of each manager and supervisor must demonstrate support and commitment to corporate management for implementing a strong and effective Radiological Controls Program.

1.8 Radiation protection records shall be prepared using high standards of accuracy, traceability and legibility to meet the requirements of regulatory agencies and company procedures. Records shall be collected and retained in such a manner that they are legible and retrievable in accordance with corporate procedure 1000-ADM-1210.02 entitled Records Management. Appropriate radiation exposure, medical and personnel information shall be obtained for company and contractor personnel assigned to work in radiologically controlled areas.

2.0 ALARA PROGRAM

2.1 The policy of GPUNC is to ensure that those risks that result from ionizing radiation exposures associated with nuclear activities are maintained as low as reasonably achievable (ALARA). Responsibility for the Radiological Controls and ALARA Programs resides with the Director, Radiological & Environmental Controls. The responsibility for assuring the implementation of these programs resides with the Radiological Controls Director at each site.

2.2 Radiological Controls is also an individual responsibility. GPUNC requires each employee or contractor employee working at GPUNC facilities to maintain individual and collective radiation exposures to workers and the public and the generation and release of radioactive materials as far below regulatory limits as is reasonably achievable. Achievement of excellence in radiological protection requires a level of performance well above minimum regulatory requirements. It is not sufficient to judge performance in radiological protection by a lack of regulatory action. Willful or habitual violation of Radiological Controls procedures will result in disciplinary action.

2.3 GPUNC is committed to operating and maintaining its nuclear stations in a manner that will minimize risks to employees, contractors, visitors and the public from exposure to radiation and radioactivity while allowing efficient conduct of operations. GPUNC has implemented a radiation protection program to ensure compliance with regulatory requirements and the ALARA objective. The basic elements of the GPUNC ALARA Program include the following:

2.3.1 Organizational responsibility and commitment.

2.3.2 Training programs.

2.3.3 Incorporation of ALARA considerations in the initial design and modification of facilities, processes and equipment.

2.3.4 Consideration of ALARA concepts in procedural development and reviews.

2.3.5 Radiological reviews of all RWP work with specific review by Radiological Engineers for work with significant dose is required.

2.3.6 Establishment of radiological goals.

2.3.7 Dose trending and performance assessment.

2.3.8 In-house audit system to evaluate ALARA program effectiveness and correct deficiencies.

2.3.9 Feed-back system for workers (e.g. Awareness Reports)

2.4 Each GPUN site shall utilize and incorporate, by practice and/or procedure, management systems to ensure that the commitment to ALARA is met. The functions to be performed by the person or persons responsible for the ALARA program are to assure that ALARA elements are considered in all applicable phases of operations involving exposure to workers. They also evaluate the effectiveness of ALARA actions by comparing actuals with goals which are established on an annual basis. From the evaluation results, recommendations for improvements are provided to senior management.

The extent of these functions is determined by the nature of the site activities and by the direction of senior management as may be promulgated by policy or procedure. Persons or committees responsible for ensuring that the ALARA commitment is met shall have direct access to senior plant management. Senior management is made aware of the company's commitment to the ALARA philosophy through company policies, (e.g., Radiation Protection Policy, Radiation Protection Plan) and interaction with Radiological Controls management. The philosophies and concepts are strengthened through general employee and special training program (e.g., ALARA Awareness Training).

Senior management is kept aware of the workings of the ALARA program on a continual basis through staff feedback, a monthly Radiological Controls report, the Radiological Assessment Reports,

Radiological Awareness Meetings, Radiological Performance Committee Meetings, Awareness Reports, QA and Radiological Engineering audits, and through direct line with the Radiological Controls Director.

2.5 The GPUNC procedures are designed to maintain personnel radiation exposures in accordance with the ALARA objective. These procedures reflect the operating philosophy contained in this plan and shall, as a minimum, establish requirements for pre-job planning, record keeping, use of special equipment, post-job evaluation, and other requirements as may be necessary to accomplish the ALARA objective. Task supervision as well as radiological controls surveillance is required for such jobs to ensure adherence to procedures, that precautions are observed, and potential problems, which may develop during job performance, are identified and resolved as quickly as possible.

2.6 Those work activities with significant radiological consequence shall have post-job evaluations and shall be documented to serve as the basis for future job planning, procedure or equipment modification in order to achieve ALARA. Activities involving the design and construction of new systems or facilities, or the modification of existing systems or facilities which may result in radiological concerns shall incorporate the ALARA concepts.

2.7 In order to achieve the goal of reduced radiation exposure, it is essential that all personnel properly implement radiological protection techniques by understanding their individual responsibility for radiological controls, as well as the responsibility of GPUNC. To gain this understanding, training and retraining programs in the principles of radiological controls, the risk of low level radiation exposure and the ALARA concept are conducted for all employees who may be involved in radiological activities.

3.0 RESPONSIBILITIES OF WORKERS

3.1 Each individual working in a Radiologically Controlled Area must remain aware of the potential for radiological problems. Because individual actions directly affect exposure and contamination levels, each individual is responsible for maintaining his or her exposure as low as reasonably achievable (ALARA).

The following rules shall be followed by individuals to minimize radiological problems:

3.1.1 Obey promptly "stop-work" and "evacuate" orders of Radiological Controls personnel.

3.1.2 Obey posted, oral, and written radiological controls instructions and procedures, including instructions on Radiation Work Permits (RWP).

3.1.3 Wear TLD and self reading dosimeter where required by signs or by Radiological Controls personnel. Immediately report loss or unexpected exposure and offscale dosimeter to the Radiological Controls Department.

3.1.4 Keep track of personal radiation exposure status to ensure that exposure limits are not exceeded.

3.1.5 Remain in as low a radiation area as practicable to accomplish work.

3.1.6 Do not loiter in radiation areas.

3.1.7 Do not smoke, eat, drink, or chew in Radiologically Controlled Areas unless specifically authorized by Radiological Controls.

3.1.8 Wear anti-contamination clothing and respiratory protection properly and wherever required by signs or by Radiological Controls personnel.

3.1.9 Remove anti-contamination clothing and respiratory protection properly to minimize spread of contamination.

3.1.10 Survey or be surveyed for contamination when leaving a contaminated area or a radiological control point. Notify Radiological Controls personnel if contamination is found.

3.1.11 For a known or possible radioactive spill, minimize its spread and notify Radiological Controls personnel promptly.

3.1.12 Do not unnecessarily touch a contaminated surface or allow clothing, tools, or other equipment to do so.

3.1.13 Place contaminated tools, equipment and solid waste on disposable surfaces (e.g., sheet plastic) when not in use and inside plastic bags when work is finished.

3.1.14 Limit the amount of material that has to be decontaminated or disposed of as radioactive waste by only bringing necessary tools and equipment into the RCA.

3.1.15 Notify Radiological Controls personnel of faulty or alarming radiation protection equipment.

3.1.16 Report the presence of open wounds to Radiological Controls and medical personnel prior to work in areas where radioactive contamination exists and exit immediately if a wound occurs while in such an area.

3.1.17 Notify Radiological Controls personnel prior to treatment if possible or upon returning to the site after medical administration of radiopharmaceuticals.

3.1.18 Assure a mentally alert and physically sound condition for performing assigned work.

3.1.19 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.

3.1.20 Supervisors must recognize their responsibility to be at the work site to ensure that radiological controls practices and procedures are enforced. Supervisors should encourage suggestions for exposure reduction during and after work is completed.

3.1.21 In order to initiate voluntary participation in, or obtain additional information about the control of occupational exposure during the periods in which an individual is pregnant, believes she might be pregnant, or intends to become pregnant, the individual must notify the Medical Department of the pregnancy or the possibility of being pregnant or the intent to become pregnant.

4.0 AUDITS, REVIEWS AND REPORTS ON THE GPUNC RADIOLOGICAL CONTROLS PROGRAM

4.1 To ensure the requirements of the GPUNC Radiological Controls Program are being met and to assist all site personnel in understanding and complying with these requirements, a system of audits and reviews shall be established including criteria for timely and appropriate corrective action. The following audits and reviews shall be used:

4.1.1 Radiological Controls technicians shall monitor and aid the performance of workers insofar as radiological work practices are concerned.

4.1.2 The Radiological Engineering section shall provide audits of the Radiological Controls Program. Radiological Engineering also performs audits of ALARA programs developed by GPUNC and contractor vendors.

4.1.3 Radiological assessments shall be conducted throughout the Radiological Controls Program on a continuous basis. This assessment function shall report directly to the Director, Radiological & Environmental Controls. A radiological assessment shall be prepared and issued at least monthly.

4.1.4 The Radiological Controls Program is subject to the provisions of the Corporate Quality Assurance Plan.

4.1.5 The GPUNC Radiation Protection Plan, Radiological Controls procedures and changes thereto shall be reviewed in accordance with Corporate Procedure 1000-ADM-1218.02, "Document Change Request Procedure."

4.1.6 In addition to these reviews and audits, a system shall be employed to allow any individual to identify radiological controls deficiencies and/or suggest improvements. A radiological controls deficiency is defined as either a deviation from an established procedure or a practice which could and should be improved. The purpose of this system is to identify those items, the correction of which will result in an improved Radiological Controls Program. These deficiencies/suggestions shall be evaluated by Radiological Engineering for desirable or necessary corrective action. The Radiological Engineering group shall prepare a monthly report summarizing the radiological deficiencies.

4.1.7 The Nuclear Regulatory Commission (NRC) also inspects and reviews the Radiological Controls Program. The Radiation Protection Plan and any changes thereto shall be submitted to the NRC for information.

4.1.8 Investigations shall be conducted to determine the causes of significant radiological incidents to determine the corrective actions and improvements necessary to prevent recurrence.

4.1.9 The Radiological and Environmental Controls Department shall review equipment and practices which affect radiological effluents in order to minimize dose to the public. In addition, the site Radiological Controls Departments will concur in the methods used for sample collection, sample analysis and documentation of radioactive releases.

5.0 RADIOLOGICAL CONTROLS TRAINING

5.1 Radiological Controls training shall be given to ensure each person who requires unescorted access to the nuclear sites or who may be involved with radiological activities understands his responsibility to minimize his own exposure to radiation and to comply with radiological controls procedures.

5.2 Category I training is for individuals who require access to a GPUNC nuclear site in other than visitor status and do not require unescorted access to "RWP required" areas. This category requires individuals to pass a written examination initially and annually thereafter.

5.3 Category I training shall include, but not be limited to:

5.3.1 Effect of radiation and risks associated with radiation exposure

5.3.2 Individual response to a radiation emergency

5.3.3 Prenatal radiation exposure (Reg. Guide 8.13)

5.3.4 Radiologically controlled areas and recognition of the associated postings

5.3.5 ALARA philosophy and concepts

5.4 Category II training is radiation worker training for individuals who require unescorted access into "RWP required" areas. This category requires individuals to pass a written examination and receive training on practical abilities initially, and annually thereafter.

5.5 Category II training shall include, but not be limited to:

5.5.1 Effect of radiation and risks associated with radiation exposure

5.5.2 Compliance with procedures

5.5.3 Use of dosimetry

5.5.4 Personnel frisking techniques

5.5.5 Anti-contamination clothing

5.5.6 Response to unusual situations

5.5.7 Exposure and contamination control

5.5.8 ALARA philosophy and concepts

5.6 Special briefings and extra training including use of mockups, where applicable, shall be conducted for work involving higher than usual exposures to radiation.

5.7 Radiological Controls Technicians (RCTs) and their Group Radiological Control Supervisors (GRCSs) shall receive theoretical and practical training and training for unusual situations. Training shall also be given for changes to procedures, equipment and programs. They shall pass both written and oral examinations and complete an examination of practical abilities consistent with their job classification. Biennial requalification shall be required including both written and oral examinations.

5.8 Respiratory Protection training is available for persons who need to use respiratory protection devices. Individuals are required to pass a written examination on the core course and to be trained on each device specified. Individuals are required to pass a written examination and attend device training on an annual basis.

6.0 CONTROL OF EXTERNAL EXPOSURE

6.1 To aid in exposure reduction, administrative radiation exposure control levels shall be established. The GPUNC annual limit is 5 rem. Collective (i.e., person-rem) exposure goals shall be established. Also, collective exposure goals for major work shall be established. Work involving radiation exposure shall be preplanned.

6.2 Major exposure jobs shall require that radiological controls be incorporated in the design, written instructions be prepared, and pre-job briefings be conducted prior to commencing work and post-job debriefings conducted for lessons learned.

6.3 Each person entering a radiologically controlled area with radiation levels grater than 0.6 mr/hr shall be provided with a primary dosimetry device (thermoluminescent dosimeter) capable of measuring the worker's whole-body exposure. Also, those entering a radiation or high radiation area shall be provided with a self-indicating, dose-integrating device.

6.4 Personnel access to radiologically controlled areas shall be defined, and controlled, according to Radiological Controls procedures.

6.4.1 Each high radiation area (i.e., greater than 0.1 rem per hour at one foot) shall be barricaded and conspicuously posted as a "High Radiation Area." Personnel desiring entrance shall obtain a Radiation Work Permit. Any individual or group of individuals entering a high radiation area shall (a) use a continuously indicating 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 Controls Technician provides positive control over activities within the area and periodic radiation surveillance with a dose rate monitoring instrument.

6.4.2 Any area accessible to personnel where a major portion of the body could receive in any one hour a dose in excess of one rem at one foot shall be locked or guarded to prevent unauthorized entry. The keys to these locked high radiation areas shall be maintained under the administrative control of the Group Radiological Control Supervisor or with those specifically authorized by the Radiological Controls Director.

6.5 To evaluate radiological conditions, radiological surveys shall be conducted for airborne activity, removable surface contamination and external radiation at regular intervals. Surveys are performed in order to (a) monitor the suitability of control measures, (b) evaluate the need for additional controls, (c) evaluate trends for ALARA purposes. Surveys outside of radiologically controlled areas are provided to insure the effective control of radioactive material. Unusual conditions detected in the performance of radiological surveys shall immediately be brought to the attention of Radiological Controls Field Operations Management. Records of surveys shall be maintained. Radiation survey instruments will be calibrated to assure an accurate, consistent, reliable and predictable response to radiation levels.

7.0 Control of Internal Exposure

7.1 The GPUNC policy is to minimize internal exposure to personnel from radioactivity associated with GPUNC operations or activities. For personnel exposed to radioactive material during their work, this means that no one should receive from internal radioactivity more than one tenth of the quarterly allowable internal exposure (i.e., 52 MPC-hours per quarter).

7.2 The following controls are utilized to minimize internal exposure from airborne radioactivity:

7.2.1 Engineering and personnel access control shall be applied to the maximum extent practicable so work in radiologically controlled areas does not create conditions where an individual may breath airborne concentrations in excess of those listed in NRC regulations. When no other controls are practicable, and ALARA considerations have been made, respiratory protective equipment may be used. Those who may need to use respirators shall meet the qualifications set-forth in the Corporate Radiation Protection Policy (1000-POL-4010.01). They shall be trained, medically qualified and successfully complete a fit test for each device used annually.

7.2.2 Airborne radioactivity shall be measured regularly in areas where personnel may be exposed. Taking representative samples of air the person is breathing shall be performed to supplement periodic measurements during work which has the potential for the generation of significant airborne radioactivity exposure to individuals.

7.3 Internal radioactivity shall be measured prior to assignment and 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 significant radioactive contamination on his skin above the neck, and in each person who is suspected of inhaling sufficient radioactivity to cause measurable internal radioactivity. Each measurement of internal radioactivity shall be reviewed.

8.0 CONTROL OF RADIOACTIVE CONTAMINATION

8.1 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 personnel and area or facility decontamination, and to minimize the need to rely on protective clothing.

8.2 The surface contamination limits for unrestricted release of materials and equipment are as follows:

		Removable
Radiological controls areas, equipment, tools and materials	Beta/Gamma	<1000 dpm/100 cm^2
	Alpha	<20 dpm/100 cm^2
		Total (fixed plus removable)
Radiological controls areas, equipment, tools and materials	Beta/Gamma	<5000 dpm/100 cm^2
	Alpha	<300 dpm/100 cm^2

8.3 Personnel are considered contaminated when any portion of the body exceeds 100 counts/min (cpm) above background using a pancake GM detector and a count rate meter. Other instrumentation of equal or greater sensitivity may be used.

8.4 Each station shall maintain procedures which address the identification and control of radioactive contamination (including hot particles) for personnel, areas, equipment and tools.

8.5 Emphasis in planning, training and working shall be placed on minimizing the occurrences of radioactive surface contamination of a person's skin or on areas not controlled for radioactive surface contamination. Occurrences of skin contamination shall be reviewed and documented in accordance with the RCPs.

8.6 Hot particle controls shall be implemented in areas where these particles exist or there is a high potential for their existence. These controls are designed to provide a method for dealing with the particles when their presence cannot be immediately eliminated and work activities must continue.

9.0 CONTROL OF RADIOACTIVE MATERIALS

9.1 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 to radiation and to prevent the uncontrolled spread of radioactivity to areas where the public might be affected. This system shall include the following requirements:

9.1.1 The number of areas in which radioactive materials are stored shall be minimized.

9.1.2 Any new radioactive material storage area shall be approved before use by the Radiological Controls Director.

9.1.3 The numbers of radioactive items and the amount of radioactivity in storage shall be minimized to the extent practicable.

9.1.4 All items having a potential for loose or fixed surface contamination shall be surveyed as they are removed from radiologically controlled areas.

9.1.5 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 or subject to unauthorized removal. This accountability procedure shall require inventory of radioactive materials which remain outside such areas.

9.1.6 Each incoming or outgoing shipment of radioactive material shall be handled in strict compliance with written procedures.

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

10.0 RADIOLOGICAL CONTROLS ORGANIZATION

10.1 A Radiological Controls program cannot be strong and effective if left solely to the Radiological Controls Department. Each worker and supervisor has the responsibility for radiological controls; consequently, the organization for each of the GPUN sites represents the organization for the Radiological Controls Program.

10.2 Each Radiological Controls Director is responsible for ensuring that a high quality Radiological Controls program is established and maintained. It is the responsibility of the Radiological Controls Department to evaluate radiological conditions and recommend precautionary measures.

10.3 At times when demands upon the Radiological Controls 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 Radiological Controls Director. Support services (instrument calibration, respiratory protection, bioassay, TLD/dosimetry, and training) may be provided by other GPUNC organizations. These support services will be administered by procedures which define the organizational interface required to insure the quality of services provided meet the commitments of the Radiation Protection Plan.

10.4 Qualifications for the key radiological directors/managers specified in Regulatory Guides will be met as far as practicable. Where the combination of strong manager and experience in radiological controls and formal technical training cannot practicably be obtained in the same person, either the director/manager or a designated subordinate will meet the requirements.

10.5 The respective TMI and Oyster Creek Radiological Controls organizations are depicted in the GPU Nuclear Organizational Plan.

11.0 REFERENCES

11.1 Radiation Protection Policy, 1000-POL-4010.01.
11.2 Title 10 Code of Federal Regulations.
11.3 Regulatory Guides 1.8, 1.33, 8.8, 8.10, 8.13, and 8.15.
11.4 Records Management Procedure, 1000-ADM-1218.02.
11.5 Quality Assurance Plan, 1000-PLN-7200.01.
11.6 Document Change Request Procedure, 1000-ADM-1218.02.
11.7 Respiratory Protection Program, 1000-ADM-4020.01.

INFORMATION ONLY

GPU Nuclear

TMI Environmental Controls
Policy and Procedure Manual

Number: 6615-PLN-4520.01

Title: **Radiological Environmental Monitoring Program - Plan**

Revision No: 1

Applicability/Scope	Responsible Office	Effective Date
This system is for radiological environmental monitoring	6615	10/30/92

Within QA Plan Scope	X	Yes		No
Safety Reviews Required	X	Yes		No

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E3-2	1						

	Signature	Date
Originator Cognizant Scientist	Timothy C. Bradley	9/22/92
Concurred By RTR	Stephen E Ocker	9/29/92
Environmental Programs Manager	William C Kessler	10/5/92
Standards Committee	Timothy C. Bradley	9/22/92
Approved By Mgr., Environmental Controls, TMI	Barry L. Gaul	10/5/92

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1.0 DEFINITIONS

Radiological Environmental Monitoring Program (REMP) - That system of environmental sample collection, analysis, and data reporting utilized to monitor radioactivity in the environment around the Three Mile Island Nuclear Station (TMINS). The REMP includes both Nuclear Regulatory Commission (NRC) required monitoring, as well as monitoring which is not required by the NRC.

Laboratory - A laboratory under contract or sub-contract to GPU Nuclear Corporation or Company laboratory for the purpose of environmental radiological sample analysis and subsequent data reporting.

Anomalous Values - Reported value which is inconsistent with what would normally be expected or a value outside an established range.

GPU Nuclear Corporation (GPUN) - A subsidiary of General Public Utility Corporation (GPU) which is responsible to operate GPU nuclear fueled electric power plants.

2.0 PURPOSE

To provide a description of the Radiological Environmental Monitoring Program (REMP) conducted in the vicinity of Three Mile Island Nuclear Stations (TMINS) and to define program requirements.

3.0 APPLICABILITY/SCOPE

3.1 This PLAN is applicable to all Three Mile Island - Environmental Controls (TMI-EC) personnel and their designees.

3.2 Any aspects of this document which conflict with applicable laws, rules, licenses, regulations, permits, orders and decision of courts, and regulatory agencies, are to be promptly brought to the attention of the Manager, Environmental Controls - TMI or designee who shall determine appropriate action.

3.3 This PLAN addresses the full REMP program which includes, as a subset, the program as required by the Nuclear Regulatory Commission (NRC) for TMI-1 and TMI-2.

3.4 This PLAN is maintained and controlled by the Manager, Environmental Controls - TMI or designee.

3.5 The Manager, Environmental Controls - TMI and staff are responsible for the execution of the REMP.

4.0 SUMMARY OF REMP

4.1 Program Requirements

4.1.1 The REMP shall, as a minimum meet the requirements set forth by the NRC for TMINS and additional commitments made by GPUN.

4.1.2 In addition to the NRC required program, the REMP may include that which is deemed necessary by the Manager, Environmental Controls - TMI, to determine the environmental impact, if any, of releases.

4.1.3 All sampling instrumentation utilized in the REMP shall be calibrated as appropriate using approved procedures, and all equipment shall be properly maintained.

4.1.4 A quality control (QC) laboratory which is independent of the primary laboratory, to the extent practical, shall be contracted by GPUN for the purpose of comparing/confirming the analyses results of the primary lab.

4.1.5 A land use census shall be conducted annually in accordance with the NRC requirements for TMINS.

4.1.6 The laboratories performing analyses on environmental samples shall participate in an NRC approved interlaboratory comparison program.

4.2 Sample Collection

4.2.1 Samples shall be collected in accordance with approved GPUN procedures.

4.2.2 Exhibit 1 of this PLAN defines the REMP Sampling locations and lists the station type (indicator vs. control) and the media which may be collected at each location.

4.2.3 Samples at additional monitoring locations may be obtained at the direction of the Manager, Environmental Controls - TMI or designee.

4.2.4 Exhibit 2 of this PLAN defines the collection frequency for each medium.

4.2.5 The frequency of collection may be modified at the direction of the Manager, Environmental Controls - TMI or designee.

NOTE

Exhibits 1 and 2 will be updated on an annual basis, as necessary.

4.3 Sample Preparation and Shipment

4.3.1 Samples shall be prepared in accordance with approved GPUN procedures to ensure sample integrity.

4.3.2 As necessary, samples shall be preserved to mitigate biological growth and/or to reduce the absorption of radioactive isotopes on the container walls. The use of such methods shall be in accordance with approved GPUN procedures.

4.3.3 When samples are sent/delivered to an analytical laboratory, GPUN shall provide the laboratory with specific instructions regarding the type of analysis each sample is to undergo.

4.3.4 Samples shall to be shipped, received and analyzed in a timely manner. GPUN shall track the sample to and from the laboratories by the use of a manifest tracking system (e.g. collection sheets and running tables).

4.3.5 Sample collection/receipt forms shall be retained by GPUN.

4.4 Sample Analysis

4.4.1 Samples shall be analyzed in accordance with laboratory procedures which are to be reviewed and approved by GPUN.

4.4.2 The analysis frequency and the type(s) of analysis performed on each sample are described in Exhibit 2 of this PLAN.

4.4.3 The analysis frequency may be modified at the direction of the Manager, Environmental Controls - TMI or designee.

4.4.4 The analyses performed on the samples may be modified at the direction of the Manager of Environmental Controls - TMI or designee.

4.4.5 At a minimum, the samples shall be analyzed to sensitivities (LLD) at or below those defined by the NRC for TMI-1 and TMI-2.

4.5 Reviews/Audits

4.5.1 Laboratory Responsibility

4.5.1.1 Analytical results of environmental samples and interlaboratory comparison program samples shall be issued on a timely basis to GPUN for review.

4.5.1.2 The laboratories performing analyses on environmental samples shall maintain a quality assurance (QA) program consistent with NRC Regulatory Guide 4.15.

4.5.1.3 Laboratories performing analyses on environmental samples shall periodically supply QA program data summaries to GPUN.

4.5.1.4 The laboratory shall review the data and check for anomalous values.

4.5.1.5 If an anomalous value is discovered, the laboratory shall notify the Environmental Programs Manager at TMI-EC or designee. The Environmental Programs Manager at TMI or designee may at that time request follow-up action to confirm the anomalous value. This may include a recount and/or a reanalysis of the sample.

4.5.1.6 If requested by GPUN, the laboratory shall prepare a written report detailing the anomalous value. This report with analysis results shall be sent to the Environmental Programs Manager at TMI-EC or designee.

4.5.2 Environmental Controls Responsibility

4.5.2.1 The data from the laboratories shall be reviewed in accordance with approved GPUN procedures.

4.5.2.2 At a minimum, the data shall be reviewed to determine if GPUN Action Levels (Pro. 6615-SUR-4523.05 and 6615-SUR-4523.06) and/or NRC reporting levels have been reached or exceeded.

4.5.2.3 This review shall also include a comparison of the primary (main) and QC laboratory results (Pro. 6615-SUR-4523.03).

4.5.2.4 Corrective action shall be taken in accordance with approved GPUN procedures (6615-SUR-4523.03, 6615-4523.05 and 6615-SUR-4523.06, as applicable).

4.6 Reports

4.6.1 Applicable REMP reports shall be prepared in accordance with GPUN approved procedures and NRC Technical Specifications (Appendix A Section 6.9 for TMI-1 and Appendix B Section 5.6 for TMI-2).

4.7 Training

4.7.1 Each individual involved in the REMP is responsible for understanding and following procedures in the area of their responsibility. If additional training is required, further guidance by an appropriate individual(s) will be provided.

4.8 Organization and Responsibility

4.8.1 The Manager, Environmental Controls - TMI and staff are responsible for the complete management of the REMP in operation at TMINS. This responsibility encompasses all phases of the program, including sample collection, sample delivery to laboratories, sample analysis, review of data, and preparation and submittal of regulatory reports.

5.0 REFERENCES

5.1 Regulatory Requirements/Guidance Exhibit 3 provides a listing of Regulatory Requirements and guidance used to develop REMP at TMI.

5.2 TMINS Offsite Dose Calculation Manual (ODCM) - Procedure 6610-PLN-4200.01

6.0 ATTACHMENTS

6.1 Exhibit 1 - TMINS REMP - Sampling Locations

6.2 Exhibit 2 - TMINS REMP - Sample Collection and Analysis By Media

6.3 Exhibit 3 - TMINS REMP Regulatory Requirements/Guidance

EXHIBIT 1

TMINS REMP - Sampling Locations

Station Code	Sample Medium	Description	Distance (Miles)	Azimuth Degrees	Station Type a
A1-1	ID	N of site, North Weather Station, TMI	0.4	0	I
A1-4	ID	N of RB centerline on W. fence adjacent to N. Weather Station, TMI	0.3	5	I
B1-1	ID	NNE of site on light pole in middle of North Bridge, TMI	0.6	25	I
B1-2	ID	NNE of RB centerline at top of dike, TMI	0.4	26	I
B1-3	ID	NNE of RB centerline on W. Fence adjacent to S. end of N. bridge, TMI	0.5	15	I
B1-4	AP, AI	NNE of site at North Gate Guard Shack	0.8	28	I
C1-2	ID	NE of RB centerline at top of dike, TMI	0.3	54	I
D1-1	ID	ENE of site on top of dike, east fence, TMI	0.2	74	I
E1-1	ID	E of site on top of dike, east fence, TMI	0.2	95	I
E1-4	ID	E of RB centerline at top of dike, TMI	0.2	98	I
F1-2	ID	ESE of RB centerline at top of dike midway within Interim Solid Waste Staging Facility, TMI	0.2	109	I
G1-3	ID	SE of RB centerline at top of dike, TMI	0.3	129	I
H1-1	ID	SSE of site, TMI	0.5	167	I
H1-3	FP	SSE of site at residence in Red Hill Plaza	0.7	150	I
H1-9	ID	SSE of RB centerline at top of dike, TMI	0.3	167	I
J1-1	ID	S of site at south beach of TMI	0.8	184	I
J1-3	ID	S of RB centerline on wooden post by old S. Gate Guard Bldg, TMI	0.3	189	I
K1-1.1A	EW	RML-7 station discharge, TMI	0.2	209	I
J1-4	ID	S of site, TMI	0.4	188	I
K1-4	ID	SSW of RB centerline on fence behind Warehouse #2, TMI	0.2	208	I
K1-5	ID	SSW of RB centerline on fence behind Warehouse #3, TMI	0.2	202	I
L1-1	ID	SW of site, west of mechanical draft towers on dike, TMI	0.1	235	I
N1-1	ID	W of site on Shelley Island	0.7	270	I
P1-3	SW	Station intake (Unit 1), TMI	0.1	284	C
N1-3	ID	W of RB centerline on fence adjacent to screenhouse entrance gate, TMI	0.1	270	I

EXHIBIT 1 (Cont'd)

TMINS REMP - Sampling Locations

Station Code	Sample Medium	Description	Distance (Miles)	Azimuth Degrees	Station Type a
P1-1	ID	WNW of site on Shelley Island	0.4	293	I
Q1-1	ID	NW of site on Shelley Island	0.5	317	I
Q1-2	ID	NW of RB centerline on fence behind Warehouse #1, TMI	0.2	318	I
R1-1	ID	NNW of site at gate in fence on W side of TMI, North boat dock	0.2	335	I
A1-2	AQS	N of site at north tip of Sand Beach Island	0.8	6	C
A1-3	AQS	N of site at north tip of TMI	0.5	0	C
C1-1	ID	NE of site on Route 441	0.7	35	I
D1-2	ID	ENE of site on Laurel Road	0.6	60	I
E1-2	AP, AI, RW ID, S, FP, AT, GW	E of site, TMI Observation Center	0.4	95	I
F1-1	ID, FP, S	ESE of site off Route 441 at entrance to 500 KV substation	0.5	117	I
F1-3	AP, AI	ESE of site inside fence at 500 KV substation	0.6	105	I
G1-1	AQS	SE of site	0.3	137	I
G1-2	ID	SE of site on Route 441	0.6	143	I
J1-2	SW	S of site below discharge pipe	0.5	188	I
K1-3	AQS	SSW of site	0.3	202	I
L1-2	ID	SW of site on Beech Island	0.5	221	I
R1-2	ID	NNW of site on Henry Island	0.7	332	I
A2-1	MG, FP	N of site, farm along Route 441	1.2	5	I
D2-1	M, S, FP	ENE of site, farm on Gingrich Road	1.1	65	I
G2-2	S	SE of site on Engle Road	1.2	125	I
J2-1	SW, AQS	S of site above York Haven Dam	1.5	182	I
J2-2	FP, S	S of site near York Haven Dam	1.5	178	I
K2-1	ID	SSW of site on S beach of Shelley Island	1.1	200	I
L2-1	ID	SW of site on Route 262	1.9	227	I

EXHIBIT 1 (Cont'd)

TMINS REMP - Sampling Locations

Station Code	Sample Medium	Description	Distance (Miles)	Azimuth Degrees	Station Type a
M2-1	AP, AI, AT RW, ID	WSW of site adjacent to Fishing Creek, Goldsboro Air Station	1.3	253	I
M2-2	FP	WSW of site at residence on Route 262, Goldsboro	1.3	252	I
N2-1	ID, GW	W of site at Goldsboro Manna	1.2	262	I
N2-2	FP	W of site at residence in Goldsboro	1.3	265	I
P2-1	ID	WNW of site off of Old Goldsboro Pike	1.9	283	I
Q2-1	ID	NW of site on access road along river	1.8	310	I
A3-1	AP, AI, ID RW, AT	N of site at Middletown Substation	2.6	358	I
A3-2	SW	N of site at Swatara Creek	2.5	355	C
1-1	AP, AI RW, ID	SSE of site at Falmouth-Collins Substation	2.3	159	I
A5-1	ID	N of site on Vine Street exit from Route 283	4.3	3	I
B5-1	ID	NNE of site, School House Lane and Miller Road	4.8	18	I
C5-1	ID	NE of site on Kennedy Lane	4.5	42	I
D5-1	ID	ENE of site off of Beagle Road	5.2	65	I
E5-1	ID	E of site, North Market Street and Zeager Road	4.6	81	I
F5-1	ID	ESE of site on Amosite Road	4.7	107	I
G5-1	ID	SE of site, Bainbridge and Risser Roads	4.8	131	I
H5-2	SW	SSE of site on Brunner Island	4.2	157	I
H5-1	ID	SSE of site at Guard Shack on Brunner Island	4.1	157	I
J5-1	ID	S of site on Canal Road, Conewago Heights	4.9	182	I
K5-1	ID	SSW of site on Conewago Creek Road, Shrinestown	5.0	200	I
L5-1	ID	SW of site, Stevens and Wilson Roads	4.1	228	I
M5-1	ID	WSW of site, Lewisberry and Roxberry Roads, Newberrytown	4.3	249	I
N5-1	ID	W of site, off of Old York Road on Robin Hood Drive	4.9	268	I

EXHIBIT 1 (Cont'd)

TMINS REMP - Sampling Locations

Station Code	Sample Medium	Description	Distance (Miles)	Azimuth Degrees	Station Type a
P5-1	ID	WNW of site, Route 262 and Beinhower Road	4.9	285	I
Q4-1	AP, AI	NW of site outside security gate at Harrisburg Intl. Airport	3.5	325	I
Q5-1	ID	NW of site on Lumber Street, Highspire	5.0	318	I
R5-1	ID	NNW of site, Spring Garden Drive and Route 441	4.9	339	I
B10-1	ID	NNE of site, West Areba Avenue and Mill Street, Hershey	9.4	21	I
C8-1	ID	NE of site, Shenks Church on School House Road	7.2	48	I
D9-1	ID	ENE of site on Mt Gretna Road, Bellaire	8.5	72	I
E7-1	ID	E of site on Hummelstown Street, Elizabethtown	6.8	86	I
E6-1	FP	E of site, orchard at Masonic Homes	5.9	100	I
F10-1	ID	ESE of site, Donegal Springs Road, Donegal Springs	9.4	112	I
G10-1	AP, AI, RW ID, S	SE of site at farm off Engle's Tollgate Road	9.8	127	C
H8-1	ID	SSE of site on Saginaw Road, Starview	7.4	163	I
J7-1	ID	S of site on Maple Street, Manchester	6.5	177	I
K8-1	ID	SSW of site, Coppenhaffer Road and Rt 295, Zion's View	7.4	196	I
L8-1	ID	SW of site on Rohler's Church Rd, Andersontown	8.0	225	I
M9-1	ID	WSW of site on Alpine Road, Maytown	8.6	242	I
N8-1	ID	W of site on Rt 382, 1/2 mi North of Lewisberry	7.8	260	I
P8-1	ID	WNW of site on Evergreen Rd, Reeser's Summit	8.0	292	I
P7-1	M, FP	WNW of site on Old York Rd, New Cumberland	6.7	293	I
Q9-1	SW, ID	NW of site across from pkg lot of Steelton Water Company	8.5	308	I
R9-1	ID	NNW of site on Derry St, Rutherford Hgts	8.1	340	I
A15-1	FP	N of site, farm on Rt 39, Hummelstown	10.5	10	C
A15-2	MG, FP	N of site, farm at intersection of Rt 22 and Crawford Rd	14.2	9	C
C20-1	ID	NE of site on Cumberland St, Lebanon	19.6	47	C
D15-1	ID	ENE of site, Rt 241, Lawn, PA	10.9	63	C

EXHIBIT 1 (Cont'd)

TMINS REMP - Sampling Locations

Station Code	Sample Medium	Description	Distance (Miles)	Azimuth Degrees	Station Type a
F25-1	ID	ESE of site. Steel Way and Loop Roads. Lancaster	21.1	113	C
F15-1	SW	ESE of site. Chickies Creek	12.6	122	C
G15-1	SW, ID	SE of site at Columbia Water Treatment Plant	14.4	124	I/C
G15-2	SW	SE of site. Wrightsville Water Treatment Plant	13.6	128	I
G15-3	SW	SE of site. Lancaster Water Treatment Plant	14.8	124	I
H15-1	ID	SSE of site. Orchard and Stonewood Roads. Wilshire Hills	13.2	157	C
J15-1	AP, AI, ID AT	S of site in Met-Ed York Load Dispatch Station	12.6	180	C
J15-2	SW	S of site at York Water Company	14.7	178	C
K15-1	ID	SSW of site. Alta Vista Rd. Weigelstown at Dover Twsp Fire Dept Bldg	12.7	204	C
L15-1	ID	SW of site on West side of Rt 74. Mt Royal	11.7	225	C
L15-2	M, FP	SW of site at farm on Rt 74 just N of Dover	12.1	219	C
M15-1	ID	WSW of site. West side of Rt 74, in front of Earth Crafts, Rossville	11.9	237	C
M15-2	FP	WSW of site on W side of Rt 74. Larew's orchard	13.6	253	C
N15-2	ID	W of site. Lisburn Rd and Main St, Lisburn	10.4	274	C
P15-1	ID	WNW of site on Erford Rd in front of Penn Harris Motel, Camp Hill	12.2	300	C
Q15-1	AP, AI, RW ID, S	NW of site at West Fairview Substation	13.5	305	C
R15-1	ID	NNW of site. Rt 22 and Colonial Rd. Colonial Park	11.2	330	C
A9-1	S	N of site off of Union Deposit Road	9.2	0	C
A9-2	S, FP	N of site on Union Deposit Rd, W of Hoernerstown	9.3	357	C
E1-3	FP	E of site, 100 m W of Peck Rd and Zion Rd intersection	0.7	90	I
E2-1	S, FP	E of site on Zion Rd	1.1	80	I
G2-1	M, FP, AP, AI, AT, RW	SE of site, farm on the E side of Conewago Creek	1.4	125	I
G3-1	S	SE of site on Governor's Stable Road	2.8	131	I

EXHIBIT 1 (Cont'd)

TMINS REMP - Sampling Locations

Station Code	Sample Medium	Description	Distance (Miles)	Azimuth Degrees	Station Type a
P3-1	FP	WNW of site on Rt 392 (Yocumtown Road)	2.6	293	I
Indicator	AQF, AQP	All locations where fish and plants are collected below the discharge are grouped together and referred to as "indicator" (i.e., sectors 11 and geographically below)	-	-	I
Control	AQF, AQP	All locations where fish and plants are collected above the discharge are grouped together and referred to as "control" (i.e., Sectors 12 and geographically above)	-	-	C
A3-3	S	N of site at junction of Swatara Creek and Route 441	2.5	354	I
H1-2	FP	SSE of site, stand off of Rt 441	0.9	150	I
D1-3	FP	ENE of site, house next to Yinger's Greenhouse on Rt 441	0.5	65	I
G2-3	S	SE of site, near Conewago Creek	1.5	132	I
K15-2	M, FP	SSW of site along Rt. 74 N at Ashcombe's Dairy Farm	12.8	208	C
A9-3	ID	N of site at Duke St. Pumping Station, Hummelstown	8.1	3	I
R15-2	ID, FP, S	NNW of site at EOF, Harrisburg	12.4	329	C
M1-1	ID	WSW of RB centerline on SE corner of Unit 2 Screenhouse fence, TMI	0.1	249	I
F3-1	M, FP	ESE of site at farm on Hilisdale Road	2.3	104	I
E2-2	M, FP	E of site at farm on Pecks Road	1.1	93	I
B15-1	FP	NNE of site at Fruit Market on Rt. 39	10.3	12	C
B2-1	ID	NNE of site on Sunset Dr. (off Hilisdale Rd.)	1.9	16	I
C2-1	ID	NE of site at Middletown Junction	1.6	48	I
D2-2	ID	ENE of site on Hilisdale Rd. (S of Zion Rd.)	1.7	73	I
E2-3	ID	E of site on Hilisdale Rd. (N of Creek Rd.)	1.9	96	I
F2-1	ID	ESE of site on Engle Rd.	1.2	120	I
G2-4	ID	SE of site on Becker Rd.	1.8	145	I
G1-7	ID	East Shore at High Water Mark, TMI	0.3	144	I
G1-4	ID	East Dike, S. End of Paint Shed, TMI	0.3	146	I
G1-5	ID	East Dike, Middle of Paint Shed, TMI	0.3	144	I
G1-6	ID	East Dike, N End of Paint Shed, TMI	0.3	141	I

EXHIBIT 1 (Cont'd)

TMINS REMP - Sampling Locations

Station Code	Sample Medium	Description	Distance (Miles)	Azimuth Degrees	Station Type a
J3-1	ID	S of site at York Haven/City	2.7	178	I
K3-1	ID	SSW of site on Rt. 262 N of City	2.1	202	I
J3-2	AP, AI	S of site at substation in City	2.9	181	I
R3-1	ID	NNW of site at Crawford Station, Middletown	2.6	338	I
P1-2	ID	N of TMI-1 Screenhouse, TMI	0.2	290	I
M1-2	ID	WSW of site on W side of unnamed island between N tip of Beech Island and Shelley Island	0.5	241	I
A4-1	M, FP	N of site at farm along Rt. 230	3.3	10	I
Indicator	GAD, ROD	All locations within 10 miles of TMINS	-	-	I
Control	GAD, ROD	All locations greater than 10 miles from TMINS	-	-	C

Station Type: I = Indicator, C = Control

IDENTIFICATION KEY

ID = Immersion Dose (TLD)
SW = Surface/Drinking Water
AI = Air Iodine
AP = Air Particulate
S = Soil
AT = Air Tritium
RW = Rain Water
M = Milk (Cow)
MG = Milk (Goat)
EW = Effluent Water
GAD = Meat (Game)
ROD = Rodent
AQF = Fish
AQP = Aquatic Plants
AQS = Aquatic Sediment
FP = Food Products (Vegetables, Fruits, Green leafy vegetation)
GW = Groundwater (offsite)

EXHIBIT 2

TMINS REMP - Sample Collection and Analysis by Media

Sample Medium (a)	Collection Frequency(b)	Analysis Type (a)	Analysis Frequency(b)
*Air Particulate[5] (AP)	Weekly(c)	*Gr-Beta(d)	On each sample
		Gr-Alpha	On each sample
		*Gamma(e)	Monthly Composite
		Sr-89	Semiannual Composite
		Sr-90	Semiannual Composite
*Air Iodine[5] (AI)	Weekly	*I-131	On each sample
Air Tritium (AT)	Weekly	H-3	On each sample
Precipitation (RW)	Monthly	Gamma(e)	On each sample
		H-3	On each sample
		Sr-89	Semiannual Composite
		Sr-90	Semiannual Composite
*Milk[4] (M/MG)	Biweekly	*I-131	On each sample
		*Gamma(e)	On each sample
		Sr-89	Quarterly Composite
		*Sr-90	Quarterly Composite
		H-3	On each sample
*Fish[2](f) (AQF)	Twice per year (Spring and Fall)	*Gamma(e)	On each sample(g)
		Sr-89	On each sample(g)
		*Sr-90	On each sample(g)
		H-3	On each sample(g)
*Aquatic Sediment[2](h) (AQS)	Twice per year (Spring and Fall)	*Gamma(e)	On each sample
		Sr-89	On each sample
		Sr-90	On each sample
*Surface Water[2](i, (SW)	Biweekly(j) (Composite)	I-131	Biweekly Composite
		*Gamma(e)	Monthly Composite
		*H-3	Monthly Composite
		Sr-89	Semiannual Composite
		Sr-90	Semiannual Composite

EXHIBIT 2 (Cont'd)

TMINS REMP - Sample Collection and Analysis by Media

Sample Medium (a)	Collection Frequency(b)	Analysis Type (a)	Analysis Frequency(b)
*Drinking Water[2](i) (SW)	Biweekly(j) (Composite)	*I-131	Biweekly Composite
		*Gr-Beta(k)	Monthly Composite
		*Gamma(e)	Monthly Composite
		*H-3	Monthly Composite
		Sr-89	Semiannual Composite
		Sr-90	Semiannual Composite
Effluent (EW)	Weekly(j) (Composite)	I-131	Biweekly Composite
		Gr-Beta	Monthly Composite
		H-3	Monthly Composite
		Gamma(e)	Monthly Composite
		Sr-89	Semiannual Composite
		Sr-90	Semiannual Composite
Aquatic Plants (AQP)	As needed	Sr-89	On each sample
		Sr-90	On each sample
		Gamma(e)	On each sample
*Vegetables[4] (FPV)	Annually (at harvest)	I-131	On each sample(g)
		*Gamma(e)	On each sample(g)
		Sr-89	On each sample(g)
		Sr-90	On each sample(g)
		H-3	On each sample(g)
*Fruits[4] (FPF)	Annually (at harvest)	*Gamma(e)	On each sample(g)
		I-131	On each sample(g)
		Sr-89	On each sample(g)
		Sr-90	On each sample(g)
		H-3	On each sample(g)

EXHIBIT 2 (Cont'd)

TMINS REMP - Sample Collection and Analysis by Media

Sample Medium (a)	Collection Frequency(b)	Analysis Type (a)	Analysis Frequency(b)
*Green Leafy Vegetables/ Vegetation[2](h) (FPL)	Annually (at harvest)	*I-131	On each sample(g)
		*Gamma(e)	On each sample(g)
		Sr-89	On each sample(g)
		*Sr-90	On each sample(g)
		H-3	On each sample(g)
*Dosimeters (TLD)[40](i) (ID)	Quarterly	*Gamma Immersion Dose	Quarterly
Soil (S)	Twice per year (Spring and Fall)	Gamma(e)	On each sample
		Sr-89	On each sample
		Sr-90	On each sample
Offsite Groundwater (GW)	Monthly	H-3	On each sample
		Gamma(e)	Quarterly composite
		Sr-90	Quarterly composite
Meat (Game) (GAD)	Annually (as available)	Gamma(e)	On each sample(g)
		Sr-89	On each sample(g)
		Sr-90	On each sample(g)
		H-3	On each sample(g)
*Rodents (ROD)	As available	Gamma	On each sample

EXHIBIT 2 (Cont'd)

Table Notations

a. Sample media and analyses denoted with an asterisk(*) are required by the NRC. The number in the brackets following the sample medium indicates the minimum number of NRC required stations to be sampled. The locations (required by the NRC) from which samples shall be collected are provided in the tables of the ODCM. Deviations are permitted from the required sampling schedule if specimens (samples) are unobtainable due to hazardous conditions, seasonal unavailability, malfunction of automatic sampling equipment and other legitimate reasons. All deviations from the sampling schedule shall be explained in the Annual Radiological Environmental Operating Report.

b. The listed frequencies for collection and analysis of NRC required media meet or exceed the time intervals as specified by the NRC. A maximum allowable extension not to exceed 25% of the interval is permitted. However, the total maximum combined interval time for any 4 consecutive tests shall not exceed 3.25 times the specified collection or analysis interval.

c. Sample collection shall be weekly or more frequently if required by dust loading.

d. Filters shall be analyzed for gross beta radioactivity 24 hours or more after sample collection to allow for radon and thoron daughter decay. If the gross beta activity on an indicator filter is greater than 10 times the mean of the control samples, the indicator filter(s) shall be analyzed for Sr-90 and gamma-emitting radionuclides.

e. Gamma (isotopic analysis) means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.

f. One sample of recreationally important bottom feeders and one sample of recreationally important predators shall be collected in the vicinity of the plant discharge (indicator) and from an area not influenced by the plant discharge (control).

g. Analysis shall be performed on the edible portion.

h. Samples shall be collected at one indicator and one control location.

i. Two samples (one indicator and one control) of surface water and drinking water shall be collected. The indicator surface water sample shall be collected downstream of the plant discharge in an area beyond but near the mixing zone. The indicator drinking water sample shall be collected at the nearest water supply that could be affected by the station discharge. The upstream (control) surface water and drinking water samples shall be taken at a distance beyond significant influence of the plant discharge.

j. Composite sample aliquots shall be collected at time intervals that are short (e.g., hourly) relative to the compositing period in order to assure obtaining a representative sample. As necessary, a weekly composite sample will be analyzed to close out each quarterly sampling period.

EXHIBIT 2 (Cont'd)

Table Notations

k. Sr-90 analysis shall be performed on the indicator drinking water sample (monthly composite) if the gross beta activity is greater than 10 times the control drinking water activity.

l. At each location direct radiation shall be measured with either two dosimeters or one instrument for continuously measuring and recording dose rate. A thermoluminescent dosimeter (TLD) is considered to be one phosphor; two or more phosphors in a packet are considered as two or more dosimeters. Film badges shall not be used.

EXHIBIT 3

TMINS
REMP Regulatory Requirements/Guidance

1. Three Mile Island Nuclear Station, Unit 1
Operating License No. DPR-50
Appendix A Technical Specifications

2. Three Mile Island Nuclear Station, Unit 2
Operating License No. DPR-73
Appendix B Technical Specifications

3. US Nuclear Regulatory Commission
Regulatory Guide 1.16
"Reporting of Operating Information - Appendix A Technical Specifications" Revision 2, Sep 1974

4. US Nuclear Regulatory Commission
Regulatory Guide 1.21
"Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light - Water - Cooled Nuclear Power Plants", Revision 1 June 1974

5. U.S. Nuclear Regulatory Commission
Regulatory Guide 4.1 Rev. 1 April 1975
Programs for Monitoring Radioactivity in the Environs of Nuclear Power Plants

6. U.S. Nuclear Regulatory Commission
Regulatory Guide 4.2 Rev. 2 July 1976
Preparation of Environmental Reports for Nuclear Power Stations

7. U.S. Nuclear Regulatory Commission
Regulatory Guide 4.5 Rev. 0 May 1974
Measurements of Radionuclides in the Environment - Sampling and Analysis of Plutonium in Soil

8. U.S. Nuclear Regulatory Commission
Regulatory Guide 4.6 Rev. 0 May 1974
Measurements of Radionuclides in the Environment - Strontium-89 and Strontium-90 Analyses

9. U.S. Nuclear Regulatory Commission
Regulatory Guide 4.8 Rev. 0 Dec 1975
Environmental Technical Specifications for Nuclear Power Plants

EXHIBIT 3 (Cont'd)

10. U.S. Nuclear Regulatory Commission
Regulatory Guide 4.13 Rev. 1 July 1977
Performance, Testing, and Procedural Specifications
for Thermoluminescence Dosimetry: Environmental Applications

11. U.S. Nuclear Regulatory Commission
Regulatory Guide 4.15 Rev. 1 Feb 1979
Quality Assurance for Radiological Monitoring Programs
(Normal Operations) - Effluent Streams and the Environment

12. U.S. Nuclear Regulatory Commission
Branch Technical Position on Regulatory Guide 4.8
Environmental Technical Specification for Nuclear
Power Plants Revision 1, November 1979

13. U.S. Nuclear Regulatory Commission
NUREG-0472, Rev. 3, 1983
Standard Radiological Effluent Technical Specifications
for Pressurized Water Reactors (Draft)

14. TMINS Offsite Dose Calculation Manual (ODCM)
(Procedure 6610-PLN-4200.01)