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August 22, 2005
5928-05-20222

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 2 (TMI-2)
POSSESSION ONLY LICENSE NO. DPR-73
DOCKET NO. 50-320
UPDATE 6 OF THE POST-DEFUELING MONITORED STORAGE SAFETY ANALYSIS REPORT

Dear Sirs:

Enclosed are the revised pages associated with Update 6 of the Post-Defueling Monitored Storage Safety Analysis Report (PDMS SAR) for TMI-2. The last revision of the PDMS SAR was issued as Update 5 on August 7, 2003. Update 6 revises the PDMS SAR to reflect the current plant configuration and administrative processes. The revised pages are indicated on the list of effective pages, which should be kept in the front of the binder containing the PDMS SAR. Also included are binder sleeves for Update 6. Changes made from Update 5 to Update 6 of the PDMS SAR are identified by bold face type within the document, and a bold line vertically drawn in the margin adjacent to the portion actually changed.

GPU Nuclear will issue the next revision of the PDMS SAR no later than 24 months from the date of this submittal.

NMSS01

Please contact Adam Miller of TMI-1 Regulatory Assurance at (717) 948-8128 if you have any questions regarding Update 6 to the PDMS SAR.

Sincerely,

James J. Byrne
GPU Nuclear, Director Three Mile Island Unit 2 (TMI-2)

JJB/awm

cc: USNRC TMI-2 Region I Inspector
USNRC TMI-2 Project Manager
NRC Regional Administrator, Region I
Ten (10) Copies to DCD
File 05055

August 29, 2005

UNIT 2 PDMS Safety Analysis Report Instruction Memorandum
UPDATE 6

CORRECT ADDRESS IF NECESSARY

RETURN TO: Debbie Marshbank, Procedure Distribution Control, South Office Building

Please update your Unit 2 PDMS SAR Update 6 with the Attachments as instructed below. Also, please sign the acknowledgement at the bottom of this memo and return to Debbie Marshbank at the address shown above.

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Additional Instructions/Comments

These replacement pages are the revised pages associated with Update 6 of the PDMS SAR.

NOTE: Also included in this package are binder sleeves for Update 6.

(Signature)	(Ext. No.)	(Date)

TMI-2

POST DE-FUELING

MONITORED STORAGE

SAFETY ANALYSIS

REPORT

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status of TMI-2 during PDMS and the location of TMI-1 on the same site, overall security will be controlled by the site security plan. All security activities established in accordance with the regulations in 10 CFR Part 50 will be protected against unauthorized disclosure in accordance with 10 CFR 73.21.

50.34(f)

Paragraph 50.34(f) establishes TMI-related requirements for a specific group of plants. TMI-2 is not included in this group of plants; therefore, this paragraph does not apply to TMI-2.

50.34(g)

Paragraph 50.34(g) requires all applicants for a reactor construction permit or operating license docketed after October 16, 2003 to include analyses and descriptions of the equipment and systems required by Article 50.44 Combustible Gas Control for Nuclear Power Reactors. As this application is not requesting a construction permit or an operating license for TMI-2, this paragraph does not apply to TMI-2.

50.34(h)

Paragraph 50.34(h) requires applicants for operating licenses docketed after May 17, 1982, to include SRP evaluations with their license applications. As this application is not requesting an operating license for TMI-2, this paragraph does not apply to TMI-2.

3.1.1.21 10 CFR 50.34a - Design objectives for equipment to control releases of radioactive material in effluents-nuclear power reactors.

Article 50.34a establishes requirements for radioactive effluent control descriptions in construction permit and operating license applications. Due to the unique condition of TMI-2 during PDMS, the specific requirements of this article are not applicable; however, there will be limited radioactive effluents to the environment during PDMS. Descriptions of the equipment to monitor and control those releases are provided consistent with the intent of this article.

3.1.1.22 10 CFR 50.35 - Issuance of construction permits.

Article 50.35 establishes requirements for the Commission with respect to the issuance of construction permits and defines the limitations of the construction permit. No exceptions are taken to the provisions of this article.

3.1.1.23 10 CFR 50.36 - Technical specifications

Article 50.36 establishes requirements for Technical Specifications. No exceptions are taken to the provisions of this article.

3.1.1.24 10 CFR 50.36a - Technical specifications on effluents from nuclear power reactors.

50.36a(a)

Paragraph 50.36a(a) establishes requirements for effluents for operating reactors. Although TMI-2 is not an operating reactor and the requirements of this paragraph cannot be complied with as written, the effluents during PDMS will be controlled and limited to very low values. The intent of the provisions of this paragraph is addressed by providing effluent limits and the description of how these limits will be met in Chapters 7 and 8.

50.36a(a)(1)

Paragraph 50.36a(a)(1) requires that procedures be developed for the control of effluents and that equipment installed in radioactive waste systems pursuant to 50.34(a) be maintained and used. Procedures in use will be in place for the control of effluents during PDMS. The TMI-2 equipment that will be used to process radioactive wastes during PDMS will be maintained and is described in Section 7.2.3.

50.36a(a)(2)

Paragraph 50.36a(a)(2) requires that each licensee submit annual reports on effluents and prepare estimated public dose from those effluents. These requirements are applicable to TMI-2 during PDMS.

50.36a(b)

Paragraph 50.36a(b) establishes guidelines for limiting radioactive effluents and references 10 CFR 20.106 and 10 CFR 50 Appendix I as applicable in limiting effluents. These requirements are applicable to TMI-2 during PDMS.

3.1.1.25 10 CFR 50.36b - Environmental Conditions

Article 50.36b establishes that the NRC may specify conditions as part of the license to protect the environment. No exceptions are taken to the provisions of this article.

3.1.1.26 10 CFR 50.37 - Agreement Limiting Access to Restricted Data

Article 50.37 establishes requirements for access to Restricted Data **and classified National Security Information.** No exceptions are taken to the provisions of this article.

3.1.1.27 10 CFR 50.38 - Ineligibility of Certain Applicants

Article 50.38 establishes that certain persons are not eligible to apply for or obtain a license. No exceptions are taken to the provisions of this article.

3.1.1.28 10 CFR 50.39 - Public Inspection of Applications

Article 50.39 states that applications and documents submitted to the Commission may be made available for public inspection. No exceptions are taken to the provisions of this article.

3.1.1.29 10 CFR 50.40 - Common Standards

Article 50.40 establishes guidelines for the Commission in determining if a License will be issued to an applicant. No exceptions are taken to the provisions of this article.

3.1.1.30 10 CFR 50.41 - Additional Standards for Class 104 Licenses

Article 50.41 establishes additional standards for class 104 licenses for the Commission to use in determining if a license will be issued to an applicant. The class of license described in this article does not apply to TMI-2.

3.1.1.31 10 CFR 50.42 - Additional Standards for Class 103 Licenses

Article 50.42 establishes additional standards for class 103 licenses for the Commission to use in determining if a license will be issued to an applicant. No exceptions are taken to the provisions of this article.

3.1.1.32 10 CFR 50.43 - Additional Standards and Provisions Affecting Class 103 Licenses for Commercial Power

Article 50.43 establishes additional standards and provisions for class 103 licenses. No exceptions are taken to the provisions of this article.

3.1.1.33 10 CFR 50.44 - Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors

Article 50.44 specifically exempts plants that have permanently ceased operations from the requirement to establish a combustible gas control system to be used in the event of a LOCA. This exemption reapplies to TMI-2 during PDMS. Thus, no exceptions to the provisions of this article are necessary.

3.1.1.34 10 CFR 50.45 - Standards for Construction Permits

Article 50.45 establishes standards for the issuance of a construction permit. No exceptions are taken to the provisions of this article.

3.1.1.35 10 CFR 50.46 - Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors

Article 50.46 specifically exempts plants that have permanently ceased operations from the requirement for emergency core cooling systems for light water nuclear power reactors.. This exemption applies to TMI-2 during PDMS. Thus, no exceptions to the provisions of this article are necessary.

3.1.1.35a 10 CFR 50.46a - Acceptance Criteria for Reactor Coolant Venting Systems

Article 50.46a establishes requirements for high point vents for the reactor coolant system. As TMI-2 is permanently shutdown and defueled with the reactor vessel head removed the requirements of this rule do not apply.

3.1.1.36 10 CFR 50.47 - Emergency Plans

Article 50.47 establishes requirements for the content and criteria for acceptance of emergency plans. Emergency planning requirements are based on the assumption of the potential necessity to notify the public of the existence of, or potential for significant off-site releases. Appendix E recognizes that emergency planning needs are different for facilities that present less risk to the public. Due to the non-operating and defueled status of TMI-2 during PDMS, there is no potential for any significant off-site radioactive release. Due to the existence of TMI-1 on the same site, emergency planning requirements for the site are dominated by TMI-1. Therefore, the limited emergency planning necessary to accommodate the existence of TMI-2 on the same site as TMI-1 has been incorporated into one integrated emergency plan. The Plan encompasses both TMI-1 and TMI-2 and is under the authority of AmerGen, the TMI-1 License holder. See the discussion of paragraph 50.34(b)(6)(v).

3.1.1.37 10 CFR 50.48 - Fire Protection

Article 50.48 establishes fire protection requirements for plants that have permanently ceased operation. These requirements are applicable to TMI-2 during PDMS.

3.1.1.38 10 CFR 50.49 - Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants

Article 50.49 specifically exempts plants that have permanently ceased operations from the requirements to establish a program for the qualification of electrical equipment important to safety. This exemption applies to TMI-2 during PDMS. Thus, no exceptions are taken to the provisions of this article.

3.1.1.54e 10 CFR 50.69 – Issuance, Limitations and Conditions of Licenses and Construction Permits

Article 50.69 provides an alternative approach for establishing the requirements for treatment of structures, systems and components (SSC's) using a risk-informed method of categorizing SSC's according to their safety significance. As TMI-2 is permanently shutdown and defueled it does not fall within the scope of this rule as defined by Article 50.69(b).

3.1.1.55 10 CFR 50.70 - Inspections.

Article 50.70 establishes requirements to permit NRC inspectors to maintain activities at each nuclear power plant site. During PDMS, TMI-2 will be required to support NRC inspection activities to the extent determined necessary by the NRC. No exceptions are taken to the provisions of this article.

3.1.1.56 10 CFR 50.71 - Maintenance of records, making of reports.

Article 50.71 establishes requirements for facility records and updating the Safety Analysis Reports. The requirements of these paragraphs apply to TMI-2 during PDMS.

3.1.1.57 10 CFR 50.72 - Immediate notification requirements for operating nuclear power reactors.

With the exception of paragraphs **50.72(b)(2)(xi) and 50.72(b)(3)(xii)**, the requirements for notification address events or situations which are related to the operation of the power plant and conditions which do, or may compromise the safe operation of the plant or cask storage of spent fuel on-site. Since TMI-2 will be specifically precluded from the operation of the plant during PDMS, the requirements of those paragraphs which relate to power plant operation will not apply. Similarly, since TMI-2's fuel has been shipped off-site, and there is no cask storage on-site, the requirements of the paragraph related to cask storage does not apply.

Paragraphs 50.72(b)(2)(xi) and 50.72(b)(3)(xii) require the reporting of any event or situation related to the health and safety of the public or onsite personnel, or protection of the environment, for which a news release is planned or notification to other government agencies has been or will be made, and any event requiring the transport of a radioactively contaminated person to an off-site medical facility for treatment. These requirements are also applicable to TMI-2 during PDMS. With the exception of subparagraph 50.72(a)(4) which is not applicable to TMI-2, required notifications will be made in accordance with paragraph 50.72(a).

3.1.1.58 10 CFR 50.73 - Licensee Event Report System

Article 50.73 requires that the holder of an operating license for nuclear power plant (licensee) shall submit a Licensee Event Report (LER) for any event of the type described in this paragraph within 60 days after the discovery of the event. The requirements of this article are applicable to TMI-2 during PDMS.

3.1.1.58a "Article 50.74 - Notification of Change in Operator or Senior Operator Status"

Article 50.74 requires each Licensee to notify the commission of a change in status of any licensed operator or senior operator. As the TMI-2 reactor has been defueled and the requirement to maintain licensed operators and senior operators at TMI-2 has been eliminated (Reference 3.1-3) this requirement is not applicable to TMI-2 in PDMS.

3.1.1.59 10 CFR 50.75 - Reporting and recordkeeping for decommissioning planning.

Article 50.75 establishes requirements for providing reasonable assurance to the NRC that funds will be available for decommissioning and periodically reporting the status of these funds to the NRC.. No exceptions are taken to the provisions of this article. Additionally, Reference 3.1-6 provided the decommissioning funding plan for TMI-2 required by 50.75(b) and Reference 3.1-15 provided the initial decommissioning fund status required by 50.75 (f) (l).

3.1.1.59a 10 CFR 50.76 – Licensee's Change of Status, Financial Qualifications

Article 50.76 requires that a licensee changing from a electric utility to a non-electric utility entity (i.e., a company that does not obtain revenue from the cost-of-service ratemaking process), in a manner other than a license transfer under 10 CFR 50.80, must submit the financial information required by Article 50.33(f)(2) for obtaining an operating license. As TMI-2 is permanently shutdown and defueled the requirements of Article do not apply.

3.1.1.60 10 CFR 50.78 -Installation Information and Verification

Article 50.78 requires that, "Each holder of a construction permit shall, if requested by the Commission, submit installation information on Form N-71, permit verification thereof by the International Atomic Energy Agency, and take such other action as may be necessary to implement the US/IAEA Safeguards Agreement, in the manner set forth in Articles 75.6 and 75.11 through 75.14 of this chapter." No exceptions are taken to the provisions of this article.

3.1.1.61 10 CFR 50.80 - Transfer of Licenses

Article 50.80 specifies requirements for transferring a license from one entity to another. No exceptions are taken to the provisions of this article.

3.1.1.62 10 CFR 50.81 - Creditor Regulations

Article 50.81 defines the rights and restrictions applying to any creditor relative to any license issued by the Commission. No exceptions are taken to the provisions of this article.

3.1.1.63 10 CFR 50.82 - Termination of Licenses

Article 50.82 defines the requirements for terminating a license. No exceptions are taken to the provisions of this article.

3.1.1.63a – 10 CFR 50.83 - Release of Part of a Power Reactor Facility or Site for Unrestricted Use

Article 50.83 defines the requirements for releasing any part of a power reactor facility or site for unrestricted use prior to receiving approval of the License Termination Plan. No exceptions are taken to the provisions of this article.

3.1.1.64 10 CFR 50.90 - Application for Amendment of License or Construction Permit

Article 50.90 establishes that a holder of a license must file an application for an amendment, describing the changes desired, if the license holder wishes to amend the license. No exceptions are taken to the provisions of this article.

3.1.1.65 10 CFR 50.91 - Notice for Public Comment; State Consultation

Article 50.91 establishes requirements applying to the Commission and TMI-2 regarding the application for an amendment to a 10 CFR Part 50 license following permanent removal of the fuel. The requirements of this article apply to TMI-2.

3.1.1.66 10 CFR 50.92 - Issuance of Amendment

Article 50.92 establishes the standards by which the Commission determines if no significant hazards exist for a license amendment. The licensee must file a no significant hazards analysis with each amendment application using the standards set forth in Article 50.92 as required by Article 50.91. The requirements of this article apply to TMI-2.

approximately six feet above the design flood at that location. The dikes along both sides of the island descend uniformly from elevation 310 ft. to elevation 305 ft., which is sufficient to protect the entire site for the design flood. A dike with a top elevation of 304 ft. extends across the southern end of the site.

Structures are provided with complete protection at the exterior faces rather than attempting to protect individual equipment or systems. The waterstops between adjacent building walls and mats were designed to be capable of withstanding a maximum water head of 45 ft., which is in excess of the maximum head associated with the flood level. The exterior sliding doors and flood panels are provided with watertight seals. Specific design features of these structures are:

a. Containment - There are no external openings in the Containment below the 305 ft. elevation.

b. Fuel Handling Building - There are no external openings in the Unit 2 Fuel Handling Building that require flood protection. The railroad door in the Unit 1 portion of the Fuel Handling Building **utilizes an inflatable rubber seal to minimize water intrusion.**

c. Control Building - Flood panels are provided for all ground level exterior entrances.

d. Auxiliary Building - A flood panel is provided for the east roll-up door entrance.

e. Control Building Area - Access to the tendon gallery is protected by watertight enclosures and flood panels at ground level.

f. Air intake - The openings in the Air Intake Tunnel are located higher than the probable maximum flood level except for a water tight hatch located at ground level, southeast of the BWST.

g. General - Doors and entrances (not flood protected) to the Concrete Power Block Buildings are either watertight or are provided with flood panels. All openings that are potential leak paths (e.g., ducts, pipes, conduits, cable trays) are configured to minimize water intrusion.

7.1.4.3 Evaluation

In addition to specific building flood protection provisions, the entire site is protected by an early warning system provided by the Federal-State River Forecast Center and a dike with a top elevation of 310.0 ft. The probable maximum flood is calculated to reach a **site elevation of 308.7 ft. (often rounded to 309 ft.).** Therefore, systems and facilities required to support PDMS activities are protected from flooding.

7.1.5 AIR INTAKE TUNNEL

7.1.5.1 PDMS Function

During PDMS, the Air Intake Tunnel provides a pathway for screened air to the following operational plant ventilating systems:

a. Reactor Building Ventilation

b. Auxiliary Building Ventilation

c. Fuel Handling Building Ventilation

d. Control Building Ventilation.

e. Service Building Ventilation

f. Control Building Area Ventilation

The Air Intake Tunnel protects these plant ventilating systems from airborne debris, flood water, and fire.

7.1.5.2 Facility Description

The Air Intake Tunnel consists of a cylindrical intake tower with screens and baffles, a 100,000 gallon sump, and an underground tunnel leading to the plant ventilating systems. The tunnel floor drains to the sump. The tunnel leads to a vertical air intake shaft which branches out into the individual supply ducts for the plant ventilating systems. The sump will be pumped out via a temporary pump, when required.

7.1.5.3 Evaluation

The Air Intake Tunnel is maintained during PDMS to provide an air supply pathway for operational plant ventilating systems. The structure is designed to protect the Air Intake System against projectiles and flooding. The openings in the tower are above the probable maximum flood level, and the baffled intake and screen prevent projectiles from entering the intake.
The Air Intake Tunnel, by design, also helps prevent the spread of fire into plant ventilating systems. Combustible material has been removed from the Air Intake Tunnel.

7.1.6 UNIT 1/UNIT 2 CORRIDOR

7.1.6.1 PDMS Function

During PDMS, the Unit 1/Unit 2 corridor serves as an operational facility to provide:

a. Heated weather enclosure for various operational system piping such as domestic water, Unit 1 discharge to IWTS and the Unit 1 Processed Water Storage Transfer System.

b. Access to the Auxiliary Building from the east outside yard through rollup security door 10.

c. Interconnecting corridor between Unit 1 and Unit 2.

7.1.6.2 Facility Description

The Unit 1/Unit 2 corridor is a heated passageway running north to south adjacent to the east side of the Turbine, Service and Control, and Auxiliary Buildings. It is a steel frame structure with metal siding over a concrete base floor, with a partial block wall up to the windows to the outside east yard. The roof has a rubber coating.

Containment and the Breather HEPA filter that will automatically close upon receipt of a Containment pressure increase of ¼ psi. The purpose of this isolation is to protect the Breather HEPA filter in the event of a significant fire in the Reactor Building.[1]

The Breather is operated in the following modes:

- Passive Breathing - AH-V-3A, AH-V-52, AH-V-153, AH-V-154 and AH-V-25 are open and AH-V-4A and AH-V-120A are closed. A filter housing door downstream of AH-F-33 is opened. In this configuration, the Reactor Building is allowed to naturally aspirate via a HEPA-filtered pathway to the Auxiliary Building which, in turn, either naturally aspirates or is ventilated to the environment through yet another set of HEPA filters. In the event of loss of air or loss of power, AH-V-52 will fail closed.
- DOP Testing - DOP testing of the HEPA filter is performed without the sample filter paper frames in place. ANSI N510-1980, Testing of Nuclear Air-Cleaning Systems will provide guidance in the performance of DOP testing of the HEPA filter.

Prior to operation of the RB Purge System, the RB Breather will be isolated. In this configuration, valve AH-V-120A, AH-V153, AH-V154, AH-V-25 and AH-V-52 will be closed and valves AH-V-3A and AH-V-4A will be open.

Provisions have been made to allow annual sample filter paper removal and assay and reinstallation or replacement of the HEPA filter.

7.2.1.2.3 Evaluation

This section demonstrates that the Containment Atmospheric Breather is the "most probable pathway" by which the Containment can discharge air to (or intake air from) the environment. It is presumed that the Containment Atmospheric Breather can be deemed the "most probable pathway" if the mass flowrate through the breather system in response to an atmospheric pressure change is orders of magnitude larger than the mass flowrates through all other pathways in response to the same pressure changes.

The mass flowrate through the Breather in response to a pressure differential can be calculated from its flow resistance. Similarly, the mass flowrate through "all other paths" can be calculated from the flow resistance for "all other paths." The flow resistance for "all other paths" can be calculated from the rate at which the pressure in the Containment attempted to achieve atmospheric equilibrium when the Containment was sealed and pressurized.

For the purpose of calculating the flowrates, the Containment is visualized as shown in Figure 7.2-1. The various known or potential leaks have been lumped together as an "equivalent" leak. The Containment Atmospheric Breather has been modeled as a 30 ft. straight length of 6-inch diameter pipe with one HEPA filter.

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[1]The maximum overpressure in Containment from the postulated worst case fire is estimated to be approximately 5 psig.

The flow through the Breather vent and the "equivalent" leak will be calculated using the extended Bernoulli equation. For the Breather:

$$(P_c/\rho) + (V_c^2/2g_c) = (P_a/\rho) + [f(l/d)] (V_v^2/2g_c) + (DP_f/\rho) \qquad (1)$$

where:

- P_c = the pressure in the Containment
- ρ = density of Containment air
- V_c = the (negligible) velocity in the Containment
- g_c = gravitational constant = 32.17 Lbm-ft/Lbf-sec^2
- P_a = the ambient pressure
- l = pipe length
- d = pipe diameter
- f = friction factor for flow through the 30 ft. pipe
- V_v = velocity in the Breather vent pipe
- DP_f = pressure drop across the HEPA filter

Since the breather system is designed to allow the Containment to respond to small changes in atmospheric pressure, the pressure differences will be small and the flow in the 6 inch diameter pipe will be assumed to be laminar. In that case, $f = 64/Re = 64/(dV_v\rho/\mu)$, where μ is the absolute viscosity of air.

The velocity in the pipe can be written in terms of the mass flowrate in the pipe:

$$V_v = (4\dot{m}_v/(\rho\, \pi d^2)) \qquad (2)$$

where:

$\dot{m}_v$ = the mass flow rate in the Breather vent pipe
d = the diameter of the Breather vent pipe

The pressure drop across the HEPA filter can also be written in terms of the mass flowrate in the pipe:

$$(DP_f/\rho) = (K\dot{m}_v/\rho^2) \qquad (3)$$

where:

K is the rated pressure drop across the filter of 1-inch of water at 1000 CFM which equals 0.312 Lbf-sec/ft^5. (Note that this assumes the HEPA filter pressure drop is linear with flow. This is conservative since the actual pressure drop will be less at the expected lower than 1000 CFM flow rate which in turn would allow more flow through the Breather.)

Substituting into equation (1):

$$\overset{o}{m}_v = (P_c - P_a) / [(128\mu/(\pi\ \rho\ g_c))(l/d^4) + (K/\rho)] \qquad (4)$$

For the "equivalent" leak, the result is the same except that the term for the HEPA filter is absent.

$$\overset{o}{m}_l = (P_c - P_a) / [(128\mu/(\pi\ \rho\ g_c))(l/d^4)] \qquad (5)$$

In this case, the quantity (l/d^4) must be determined. To find an equivalent value of (l/d^4) for the leaks, data from the leak test of the Containment were used. In the test, the proportional leak rate was calculated as 0.0852% per day when the Containment was held at 70.6 psia. Since the pressure in the Containment is proportional to the air mass in the Containment, the proportional leak rate is the leak path mass flowrate, m_l, divided by the air mass in the Containment at the time of the measurement.

$$.0852\%/day = \overset{o}{m}_l/M = \overset{o}{m}_l/(\rho V)$$

where:

M = the Containment air mass

V = the Containment free volume = 2.1E6 ft^3

Converting the leak rate from % per day to inverse seconds, and combining with equation (5):

$$(0.000852/(24 \times 3600)) = (P_c - P_a) / [(\rho\ V)(128\mu/(\rho\ \pi g_c))(l/d^4)] \qquad (6)$$

As a result:

$$(l/d^4)_{leak} = (P_c - P_a) / [(128V\mu/\pi g_c)\ (0.000852 / (24 \times 3600))]$$

Which, in turn, leads to the determination that the equivalent value of (l/d^4) for the leak paths is:

$$(l/d^4)_{leak} = 2.61E10\ ft^{-3}$$

[If the length of the leak path is on the order of the Containment wall thickness (i.e., 4 ft), the total leak diameter would be 0.042 inches.]

The ratio of leak flow to Breather vent flow can then be written as:

$$\overset{o}{m}_l / \overset{o}{m}_v =$$

$$[(128\mu/\pi g_c)(l/d^4)_{vent} + K] / [(128\mu/\pi g_c)(l/d^4)_{leak}] \qquad (7)$$

with:

$(l/d^4)_{vent} = 480\ ft^{-3}$

$K = 0.312$ lbf-sec/ft^5

This gives the ratio of mass flow rates as:

$$(\dot{m}_l / \dot{m}_v) = (0.00717 + 0.312) / 3.89E5 = .000001$$

Therefore, the Containment Atmospheric Breather clearly is "the most probable pathway".

As stated in Section 7.2.1.2.2, there is a welded plate installed downstream of the HEPA filter that holds four sample filter paper frames; each frame holds a set of two filter papers. The air flow into and out of the containment via the Breather also passes through each set of two sample filters. (For the purposes of this discussion, the sample filter papers closest to the Breather HEPA will be referred to as the No. 1 Filters and the sample filter papers farthest from the Breather HEPA and closest to the Auxiliary Building atmosphere as the No. 2 Filters.) The Breather HEPA filters the air leaving the Containment into the Auxiliary Building. Filter No. 1 collects the material that may pass through the HEPA filter. Filter No. 2 filters and samples the air coming back into the Containment from the Auxiliary Building.

All four of the No. 1 Filters are removed annually and one is assayed for radioactivity. If any activity is found on the filter, it will be assumed that, for the sampling time period, a like amount of activity was released from the Containment into the Auxiliary Building (i.e., an assumed efficiency of 50%). This is a very conservative approach since the sample filter papers used have a collection efficiency of greater than 90%. Using this methodology, any activity assumed to be released is captured on the filter and will be assumed to have been released over the six month time period. Since the filter deposition is cumulative, this method provides determinative (but not real time) monitoring to verify that effluents through the Breather are within the calculated values in Chapter 8. Due to the extremely low releases calculated for PDMS, the sample filter paper is deemed adequate for determining the releases anticipated during PDMS.

7.2.1.3 Containment Ventilation and Purge

7.2.1.3.1 PDMS Function

During PDMS, the Containment Ventilation and Purge System ensures that uncontrolled atmospheric migration of radioactive contamination will not create a hazard to either the public or site personnel.

7.2.1.3.2 System Description

The Containment Ventilation and Purge System will be maintained in an operational condition to support activities in the Containment (e.g., surveillance entries, maintenance) during PDMS. Testing to ensure operability of the Containment Ventilation and Purge includes HEPA filter pressure drop, exhaust flow rate, DOP testing (guidance provided by ANSI N510-1980), and visual inspection of the filter train. The Containment Ventilation and Purge System consists of a single operational Containment purge exhaust unit, make-up air supply associated ductwork, dampers, and filters. The purge exhaust unit (maximum flow 25,000 cfm) draws air from the D-rings through HEPA filters, and discharges to the station vent. The PDMS configuration is shown on GPUN Drawing 302-2041.

7.2.1.3.3 Evaluation

Operation of the Containment Vent and Purge System provides fresh air to the Containment while providing a filtered, monitored exhaust path. Atmospheric radiation monitoring, as described in Section 7.2.4, provides for monitoring of airborne releases from the system by using monitors located in the exhaust duct and in the station vent. This ensures that releases from the Containment to the environment are minimal.

7.2.1.4 Containment Airlocks and Equipment Hatch

7.2.1.4.1.1 PDMS Function

7.2.3.2 Sump Pump Discharge and Miscellaneous Sumps System

7.2.3.2.1 PDMS Function

There are a number of sumps in TMI-2 that will be maintained in an operational condition during PDMS. The various sumps and their locations are listed in Table 7.2-3.

Maintaining the various building sumps operational assures that water buildup does not cause adverse localized flooding. These sumps will contain water that is either clean or slightly radioactive. Clean water is presently routed to the Industrial Waste Treatment System (IWTS). Radioactive water will be processed and discharged via approved pathways; slightly radioactive water will be pumped to the IWTS and released in accordance with 10 CFR 20, 10 CFR 50 and NPDES regulations. The discharge from the IWTS is monitored for radiation in accordance with the ODCM.

7.2.3.2.2 System Description

The designs of the various sumps are delineated in the applicable documents referenced in Section 7.3. The PDMS configuration is shown on GPUN Drawing 302-2496. The sumps have the capability of being pumped automatically with the pumps controlled by float switches; however, they will normally be operated in the manual mode with a high level alarm that annunciates in the control room and the PDMS Alarm Monitoring System. Sump level is monitored by level detectors located in the respective sumps. The exceptions are the Circulating Water Chlorinator Building, and the Air Intake Tunnel Normal Sumps which will employ portable sump pumps to pump down the sumps as necessary.

Water from the floor drains that enters these sumps is generally not contaminated, although sumps within the Turbine Building, Control Building Area, Control and Service Building, and Tendon Access Gallery have recirculation and grab sample lines to permit sampling for radioactivity.

7.2.3.2.3 Evaluation

In general, the functional requirements of each sump and sump pump have been determined on an individual basis.

Monitoring of level in the various sumps by remote means and/or visual inspections ensures that accumulated leakage is transferred for processing in a timely manner. Sampling will be used to quantify radioactive content and ensure proper waste stream processing.

Therefore, operation of the sump pump discharge system ensures liquid waste streams generated during PDMS are adequately transferred for ultimate processing and do not adversely affect the PDMS plant conditions.

7.2.4 RADIATION MONITORING

7.2.4.1 PDMS Function

During PDMS, the radiation monitoring requirements for the facility are primarily those associated with assuring the stability of the radiological conditions in the facility and effluent monitoring. The off-site dose calculations for normal time periods and unanticipated events (see Chapter 8) are based on assumed and measured radiological conditions associated with the various areas of the facility. In order to assure that the off-site dose calculations for the various events remain bounding, the radiological conditions must be periodically monitored to assure they remain within acceptable bounds. In addition, all effluents must be monitored to assure all off-site releases are within acceptable bounds, as well as to meet regulatory requirements for effluent reporting.

Broader radiological conditions monitoring will be conducted throughout the facility to assure compliance with good radiological conditions practices and 10 CFR 20. These radiological monitoring activities are required to support other PDMS activities such as visual inspections, preventive maintenance or other routine tasks.

7.2.4.2 Radiological Surveys

7.2.4.2.1 AFHB Radiological Surveys

Radiological surveys will be conducted on a periodic basis to monitor radiological conditions in the Auxiliary and Fuel Handling Buildings. These radiological surveys will be conducted quarterly and will consist of air sampling, loose surface contamination, and radiation does rate surveys. In addition, TLDs may be placed in fixed locations and changed out periodically to monitor dose rates over a long-term period. Radiological survey results will be reviewed and evaluated for trends to provide early detection of deteriorating radiological conditions.

7.2.4.2.2 Containment Radiological Surveys

Periodic Containment radiological surveys are required to provide information regarding the stability of the radiological conditions inside the Containment. As stated in Section 7.2.4.1, this information is necessary to periodically validate the off-site releases as calculated in Chapter 8. Radiological surveys just outside the containment airlock doors will be conducted quarterly, as expressed in Regulatory Guide 1.86 Position 3.C. Radiological surveys inside containment will be conducted annually, as a minimum, at the approximate locations shown on Figures 7.2-11 and 7.2-12. Monthly radiological surveys in the Containment were performed after the RB was placed in its PDMS condition in order to develop an adequate data base. These surveys consisted of loose surface contamination and radiation dose rates at all survey locations and at least one air sample inside the containment.

The annual surveys will collect data from the same locations. In addition, TLDs may be placed in fixed locations and changed out periodically to monitor dose rates over a long-term period. These surveys will be reviewed and evaluated for any indicated trends. This will either provide assurance that contamination conditions inside the Containment are stable or will provide early indication of any changing conditions which may require corrective action.

7.2.4.3 Effluent Monitoring

Airborne effluents will be monitored during active and passive ventilation of the Containment. Periodic operation of the Reactor Building Purge may be necessary during personnel entries. During Reactor Building Ventilation System operation, the station ventilation stack monitor, HP-R-219 or HP-R-219A, will provide real time monitoring of releases. The Reactor Building effluent monitoring system is shown on GPUN Drawing 302-2219. During periods when the Containment ventilation systems are not operating, airborne effluents from the Containment will continue to be monitored as discussed in Section 7.2.1.2.3.

The Containment is passively vented to the Auxiliary Building through a breather pathway which will be filtered using a HEPA filtration system. During periods of Reactor Building Purge operation the breather pathway will be isolated. During passive ventilation the purge exhaust will be isolated and the Containment will be vented through the breather HEPA filter. On an annual basis, a sample filter paper installed downstream of the HEPA filter will be assayed for its radioactivity content to evaluate any release to the environment during periods of inactivity.

The Containment Atmospheric Breather System allows pressure equalization between the Containment and the environment via the Auxiliary Building. For this reason there is no motive force to cause contamination to leak out other than through the Containment Atmospheric Breather. Therefore, it is not anticipated that releases to the environment will occur through pathways other than the breather. Operating procedures for Containment isolation and operation of airlock doors will be used during PDMS to ensure isolation is maintained.

In the AFHB, negligible airborne effluent discharges are anticipated during normal events. This conclusion is based on three factors: 1) de facto isolation of the AFHB, 2) prevention of airborne events within the AFHB, and 3) the periodic monitoring of radiological conditions. Access to the AFHB is limited and controlled by site procedures. The ventilation system exhaust, as shown in GPUN Drawing 302-2042 houses a prefilter for large particulates, and two banks of DOP-tested HEPA filters in series. With the AFHB essentially isolated, there is no motive force to generate significant airborne contamination levels, and any airborne contamination that might develop is filtered by the ventilation system exhaust pathway prior to release to the Station Vent.

Prevention of airborne contamination within the AFHB results, in part, from the lessened level and frequency of plant system operations and reduced access and activities of plant personnel. In addition, internally contaminated systems inside the AFHB are drained of liquids, and isolated by closing the respective boundary valves. Spent fuel pool "A/B" were sealed since they contained loose contamination sufficient to pose a contamination spreading concern.

Throughout PDMS, an ongoing radiological surveillance program will monitor radiological conditions within the AFHB. By means of various surveys, as described in Section 7.2.4.2, potential degradation of radiological conditions will be identified in order for appropriate remedial actions to be taken. A special monitoring program of AFHB airborne levels, see Section 7.2.4.3.1, was conducted for a one year period prior to PDMS, and was continued for a minimum of one year after implementation of PDMS. The information gathered during these evaluations constitutes an extensive data base that provides additional assurance that AFHB airborne effluent releases will be insignificant in nature. In addition to the special monitoring program, whenever the AFHB ventilation systems are operated during PDMS, the HEPA filtered exhaust is also monitored by the real time sampling of the Station Vent Monitor, thus assuring a controlled, monitored effluent release.

Considering that the AFHB has orders of magnitude less contamination than the Containment, the airborne effluent controls described above are sufficient for assuring airborne effluent releases from the AFHB during normal events will be insignificant.

A certain amount of inleakage into sumps is anticipated during PDMS and periodic discharges will be necessary. Initial samples will be taken and analyzed to quantify radioactive effluents. All radioactive liquid discharges will be via an approved pathway which will provide dilution and monitoring capabilities.

7.2.4.3.1 AFHB Airborne Evaluation

A special monitoring program was designed to evaluate particulate airborne concentrations in the AFHB prior to, and after, entry into PDMS. The purpose of the evaluation was to determine the airborne levels in the AFHB during steady state conditions.

The most representative sample point of unfiltered AFHB airborne particulates was directly upstream of the plant ventilation system HEPA filter banks. Installed plant monitoring capabilities existed at both of these locations, i.e., HP-R-221A for the Fuel Handling Building and HP-R-222 for the Auxiliary Building. The moving filter paper mechanisms of these plant monitors was disabled, creating fixed filter sample points. The filter papers at these plant monitors were periodically changed out, and air sample results were reported quarterly.

The special monitoring program was temporarily suspended whenever plant activities in the AFHB were expected to generate significant airborne levels.

The special AFHB airborne evaluation concluded that the average particulate airborne generation rates of the Auxiliary and Fuel Handling Buildings were significantly below the 2.4 E-4 uci/sec acceptance criterion. The acceptance criterion was less than 1% of the TMI-2 Recovery Technical Specification for release of rate particulates with half lives greater than eight days. This corresponds to less than 1% of 0.024 uci/sec when averaged over any calendar quarter.

7.2.5.2 Normal and Emergency Lighting

7.2.5.2.1 PDMS Function

TMI Unit 2 is provided with normal lighting systems using mercury-vapor, **metal halide,** fluorescent and incandescent luminaries. These systems provide illumination for PDMS support activities and for personnel safety. All lighting not required for security and monitoring activities will be turned off. Lighting will be energized as needed for maintenance activities.

Installed emergency lighting will be maintained during PDMS. One-half of the normal lighting originally designed and installed is available throughout TMI-2 except in the RB. Normal lighting within the RB is provided by strings of lights installed on the 305' and 347' elevations. The lighting is adequate to support PDMS inspection and test activities without additional illumination from permanently installed building lighting. Eight-hour portable emergency lighting will be carried by emergency personnel crews entering the buildings. This lighting will be staged with emergency response crew equipment. Routine entry crews will carry flashlights.

7.2.5.2.2 System Description

The PDMS lighting system is powered from normal AC power sources; an exception to this is the RB lighting system discussed below. This system utilizes three types of luminaries: mercury-vapor, fluorescent and incandescent. The mercury-vapor **and metal halide** luminaries are powered from 480/277-volt systems directly from the 480-volt unit substations or from 480-volt motor control centers. The fluorescent and incandescent luminaries are powered from 208/120-volt systems utilizing 30 KVA step-down transformers which are supplied from the 480-volt sources. In general, the mercury-vapor luminaries are used in high ceiling areas, the fluorescent luminaries in almost all other areas, and the incandescent luminaries where environmental conditions require their use. Exit signs are powered from **receptacle power with rechargeable internal batteries for backup.**

Emergency lighting consists of sealed beam lamps powered by batteries which initiate operation upon loss of the normal lighting system. This lighting is provided to ensure safe egress for personnel. Additional exit information will be provided by postings.

The RB normal lighting system consists of lights on the 305' and 347' elevations fed from Portable Power Distribution Centers (PPDC) or "power buggies." These power supplies were originally installed in the RB to support defueling activities. Two power buggies are located on the 305' elevation and two are located on the 347' elevation. The power feed is from either USS 2-35 or USS 2-45 and is configured such that the two power buggies on each elevation are energized from different sources, i.e., on each elevation, one-half of the lighting is fed from one source and the other half is fed from the other source. In the event one source of power is lost during an entry, adequate lighting would remain to assist in the safe evacuation of personnel.

7.2.5.2.3 Evaluation

The majority of the existing lighting systems remains operational during PDMS. Sufficient lighting capability is provided for anticipated support activities. If further needs arise, temporary lighting will be added for specific PDMS activities.

7.2.5.3 Communications System

7.2.5.3.1 PDMS Function

The TMI-2 Communications System during PDMS will provide normal communication channels throughout Unit 1 and Unit 2.

In addition, the Communications System will provide the capability to announce alarms and alert personnel to radiation and fire hazards.

7.2.5.3.2 System Description

Portions of the original system have been retained for PDMS as follows:

a. Normal Page - Party System

This system is powered from a separate 120-volt, single-phase AC power bus. The system is compatible with TMI Unit 1 and was merged with the TMI Unit 1 system through a merge-isolate switching arrangement in the control room to provide normal communication channels throughout TMI Units 1 and 2 (excluding Unit 2 RB) during PDMS.

The reactor building paging system is currently disabled. This was accomplished by disconnecting five cables and removing the handsets inside both air locks. The cables can be re-landed and the handsets reinstalled to allow the reactor building paging system to be returned to service.

The system consists of handsets, amplifiers, loudspeakers, evacuation tone generator, isolating transformer, and the necessary special equipment to provide a paging channel and three party line channels.

b. Radio-Antenna System

This system consists of antennas located at strategic points within the TMI-2 PDMS Buildings to ensure full coverage for radio communications. This system is the back-up system for a loss of the normal page-party system.

c. Commercial Telephone System

This system's trunk lines are leased from the Telephone Company. The handsets and switching equipment are maintained by TMI-1 personnel. This system provides links with all on site as well as off-site locations.

greatly reduced.

7.2.6.3 Air Intake Tunnel Ventilation System

The Air Intake Tunnel will be maintained only as a supply pathway for screened air to plant ventilating systems during operation. It consists of a cylindrical intake tower with screens and baffles, a 100,000 gallon sump, and an underground tunnel leading to the plant ventilation systems. The PDMS configuration is shown on GPUN Drawing 302-2219.

During PDMS, the Air Intake Tunnel provides a supply pathway for ventilation systems operation to meet industrial and radiological requirements.

7.2.6.4 Compressed Air Supply System

7.2.6.4.1 PDMS Function

Portions of the original plant Instrument and Service Air Systems will be utilized during PDMS to provide compressed air to operational pneumatic devices in the following systems:

a. Waste Disposal - Liquid

b. Auxiliary Building Ventilation System

c. Fuel Handling Building Ventilation System

d. Control Building Ventilation System

e. Service Building Ventilation System

f. RB Purge System

g. RB Breather System

7.2.6.4.2 System Description

The Compressed Air Supply System consists of two air-cooled air compressors, air dryer, receivers, and the piping and valves required to distribute compressed air to operational pneumatic devices. The major components, piping, and valves of the original plant Instrument/Service Air Systems have been incorporated as part of the Compressed Air Supply System. Two air-cooled air compressors and associated air dryer are used to supply air to the modified systems in place of the original water-cooled compressors. The Compressed Air System will be operated continuously to support operations.

7.2.6.4.3 Evaluation

The Compressed Air Supply System primarily utilizes the portions of the original plant Instrument/Service Air System, which are required to store and distribute air to pneumatic devices supporting PDMS. Since cooling water will not be available during PDMS to cool air compressors, air-cooled air compressors have been used.

7.2.6.5 Building Inleakage Waterproofing System

7.2.6.5.1 PDMS Function

During PDMS, the TMI-2 building waterproofing systems serve to direct roof rainwater into the site stormwater drainage system and prevent groundwater from entering buildings through joints, penetrations, and cracks.

7.2.6.5.2 System Description

The plant waterproofing systems consist of:

a. Building roofing systems

b. Basement waterproofing from groundwater.

c. A cork seam monitoring system (see Section 1.1.2.2.4).

Rainwater is directed via roof slope to roof drains which carry the rainwater to the site stormwater drainage piping. All runoff is collected in a retention basin which can be monitored prior to discharge into the Susquehanna River.

All basement walls are poured concrete. To prevent groundwater inleakage, the following were performed:

a. All penetrations through basement walls were sealed.

b. Expansion joints between building foundations were sealed with waterstops, cork filler, and epoxy sealant.

c. Construction joints were keyed to deter water seepage through them.

7.2.6.5.3 Evaluation

In preparation for PDMS, various building seams, link seals, and major cracks have been repaired to the extent practical to minimize expected inleakage from storms and high groundwater levels. The inleakage rates and flowpaths experienced to date do not affect plant equipment required for PDMS. Additionally, the Sump Pump Discharge and WDL system are operational to transfer accumulated water to minimize potential spread of contamination due to localized flooding.

7.2.6.6 Sewers

7.2.6.6.1 PDMS Function

The basic function of the sewage collection system is to transport sewage from TMI-2 structures to the Sewage Treatment Plant. The PDMS configuration is shown on GPUN Drawing 302-151.

7.2.6.6.2 System Description

Sewage from the temporary personnel access facility (TPAF) in the Turbine Building is routed to the Sewage Treatment Plant (STP) which serves both TMI-1 and TMI-2. The major operational portion of the Sewer System is underground gravity flow piping that provides for the transport of sewage from the Unit 2 support facilities to the STP.

7.2.6.6.3 Evaluation

The Sewage Treatment Plant will process sewage from the TPAF. The majority of TMI-2 sewage piping is underground below the frost line. The original plant sanitary waste/sewage system is deactivated.

7.2.6.7 Domestic Water System

7.2.6.7.1 PDMS Function

During PDMS, portions of the existing domestic water system will remain operational to provide domestic water services required during PDMS.

7.2.6.7.2 System Description

The domestic water system is maintained as a modified operational system. Unit 2 is supplied with domestic water from Unit 1 which is then distributed to Unit 2 support facilities. Domestic water is provided to the radwaste seal water unit in the Auxiliary Building, to the TPAF in the Turbine Building, and to several outbuildings. The PDMS configuration is shown on GPUN Drawings 302-158 Sht. 4.

7.2.6.7.3 Evaluation

Since personnel access into the plant will be infrequent, only one source of domestic water is required in the Turbine Building. The Auxiliary Building header supplies domestic water to the seal water unit. Unit 1 and Unit 2 support facilities will remain operational; therefore, domestic water will continue to be supplied.

7.2.6.8 Control Room Ventilation System

7.2.6.8.1 PDMS Function

The Control Room Ventilation System will be maintained in an operational condition to support PDMS activities. This system provides fresh, filtered, heated or cooled air in sufficient quantity to support personnel occupancy and equipment protection.

7.2.6.8.2 System Description

The Control Room Ventilation System consists of one supply fan (AH-C-16B) running in a forced ventilation mode during normal year round conditions. The supply fan will primarily recirculate the control room air as it is heated/cooled. A small amount of fresh air (outside air) will be force supplied by bypass booster fan (AH-C-16X). Exhaust fan (AH-E-35) will return control room air to the suction of supply fan (AH-C-16B). A small amount of the control room air will be "exhausted" out of this recirc mode, primarily by exfiltration dampers in the control room and via the kitchen and toilet fans. This provides for a small amount of air change per day.

Control Room air temperature is monitored by a **programmable thermostat** located in the Control Room return air duct. The **programmable thermostat** provides signals to a local temperature controller which controls heating or cooling as conditions dictate. Two steps of heating are available for freeze protection and two stages of cooling are available from the 10 ton air conditioner which also reduces Control Room humidity.

Neither cooling or heating functions will operate unless supply fan (AH-C-16B) is running and satisfying a flow switch in the supply air duct.

Additional outside air can be provided by performing special operations if the chiller malfunctions and/or additional cool outside air is desired.

7.2.6.8.3 Evaluation

During PDMS, Control Room ventilation and air handling equipment provides a filtered pathway for active operation to meet industrial and radiological requirements. The Control Room Ventilation System is maintained operational for the maintenance and surveillance entries into the TMI-2 Control Room and in response to off-normal conditions.

7.2.6.9 Cable Room Ventilation System

7.2.6.9.1 PDMS Function

The Cable Room Ventilation System will be maintained in an operational condition to support PDMS activities. When in operation, this system provides fresh, filtered, heated air in sufficient quantity to maintain room temperatures suitable for personnel and equipment.

7.2.6.9.2 System Description

The Cable Room Ventilation System is a forced flow heating and ventilation system consisting of a supply and exhaust-return subsystem which provides ventilation with partial recirculation.

When the ventilation system is not operating, a damper in the bypass duct will open, allowing free passage of air in the exhaust-return duct system.

7.2.6.9.3 Evaluation

During PDMS, Cable Room ventilation and air handling equipment provide a filtered pathway during system operation to meet industrial requirements and provide the appropriate environment for instrumentation and annunciator equipment.

7.2.6.10 Service Building Ventilation System

7.2.6.10.1 PDMS Function

The Service Building Ventilation System will be maintained in an operational condition to support PDMS activities. When in operation, this system performs the following functions:

a. Provides fresh, filtered, heated air in sufficient quantity to maintain room temperatures suitable for personnel and equipment.

b. Minimizes the spread of contamination by providing air flow from clean areas to potentially contaminated areas, and then to the exhaust.

c. Filters exhaust air.

7.2.6.10.2 System Description

The Service Building Ventilation System is a forced flow heating and ventilation system consisting of supply and exhaust subsystems. Exhaust HEPA filter trains, which provide once-through ventilation with partial recirculation of clean areas.

7.2.6.10.3 Evaluation

During PDMS, Service Building ventilation and air handling equipment provide a filtered pathway during system operation to meet industrial and radiological requirements. This system is maintained operational for personnel ingress and egress to the Reactor Building, Auxiliary Building, and Unit 2 Control Room, for maintenance and surveillance entries into the Service Building, and provides ventilation for the Compressed Air System compressors.

7.2.6.11 PDMS Alarm Monitoring System

7.2.6.11.1 PDMS Function

The function of the plant computer alarm system is to notify plant operations personnel of an abnormal plant condition which requires operator action to correct or which represents a threat to plant, personnel or equipment safety. The PDMS Alarm Monitoring System provides the means to remotely monitor select TMI-2 alarms and TMI-2 station vent monitor signals in the TMI-1 Control Room via the TMI-1 plant computer. As required by the TMI Emergency Plan, the PDMS Alarm Monitoring System is designed such that if the remote monitoring of the alarms in Unit 1 becomes inoperable, the TMI-2 Control Room alarms and station vent monitor signals can be monitored from the annunciators and other recorders/equipment in the TMI-2 Control Room. The alarms and functions to be monitored are listed in Operating Procedure 1105-22, Response To PDMS alarms. (Ref. 7.3-13).

7.2.6.11.2 System Description

The plant computer uses four types of alarm information display systems - alarm CRTs, alarm displays on a Utility CRT, alarm summaries on a Utility CRT and an alarm printer. The modifications that were necessary to facilitate installation/operation of the PDMS Alarm Monitoring System were as follows:

1. A fiber optics cable link was installed between the TMI-1 computer system in the OSF Building and the TMI-2 multiplexer unit located in the TMI-2 Control Room.

2. A multiplexer unit was installed in the Unit 2 Control Room to interface with all required signals from the field (i.e., sensors or annunciators) or the Unit 2 Control Room annunciators. The multiplexer performs the necessary signal processing to convert the digital and analog signals to a light signal which is transmitted back to the TMI-1 computer via the fiber optics cable link.

3. The required digital alarm inputs and analog signals were interconnected to the multiplexer unit.

4. The multiplexer receives 120VAC power from a 480/120VAC regulated transformer. This transformer receives 480VAC power from one of two sources. Normally it will be fed from the TMI-2 480VAC system or, as a backup, it can be fed from one of TMI-1's 480VAC B.O.P. power systems.

5. A Mini-Uninterruptible Power Supply (UPS) provides backup power to the multiplexer in

TABLE 7.2-1
OPERATIONAL SYSTEMS

SYSTEM DESCRIPTION	SYS CODE	CONTAINMENT ISOLATION	INTERNAL CONTAMINATION	REMARKS
CONTAINMENT ATMOSPHERIC BREATHER	AH	YES	YES	PASSIVE SYSTEM; PERIODIC INSPECTION OF HEPA FILTERS & ASSAY OF SAMPLE FILTER PAPERS
CONTAINMENT VENTILATION & PURGE	AH	YES	YES	OPERATED IN PURGE MODE TO SUPPORT CONTAINMENT ENTRIES
CONTAINMENT AIRLOCKS & EQUIPMENT HATCH	RBA	YES	N/A	AIRLOCKS FOR PERSONNEL/EQUIPMENT ACCESS; EQUIPMENT HATCH WILL REMAIN IN PLACE
FIRE PROTECTION	FP	N/A	N/A	ZONE FIRE DETECTION SHALL BE OPERATIONAL THROUGHOUT OPERATIONAL PLANT AREAS
FIRE SERVICE	FS	YES	N/A	PROVISIONS HAVE BEEN MADE AND EQUIPMENT HAS BEEN STAGED TO UTILIZE LOOP HYDRANTS
FIRE SUPPRESSION EQUIPMENT	FS	N/A	N/A	PORTABLE FIRE SUPPRESSION EQUIPMENT ARE STAGED WITH EMERGENCY RESPONSE CREW EQUIPMENT
WASTE DISPOSAL - LIQUID (MISC)	WDL	YES	YES	NECESSARY EQUIPMENT/TANKS TO PROCESS WATER WILL BE MAIN- TAINED OPERATIONAL. ONLY THE BUILDING SUMP PUMPS, THE MISC. WASTE HOLDUP TANK (WDL-T-2), THE ABST (WDL-T-5) AND INTERCONNECTING PIPE SHALL REMAIN OPERATIONAL FOR WATER REMOVAL FUNCTIONS.
SUMP PUMP DISCHARGE & MISCELLANEOUS	SD	N/A	YES	FACILITIES ARE SEALED TO LIMIT EXTERIOR WATER INGRESS. PERIODIC SUMP PUMP OPERATIONS WILL PREVENT SUMP ACCUMULATION OF DRAINAGE AND INADVERTENT INLEAKAGE.

TABLE 7.2-1 (Cont'd)
OPERATIONAL SYSTEMS

SYSTEM DESCRIPTION	SYS. CODE	CONTAINMENT ISOLATION	INTERNAL CONTAMINATION	REMARKS
RADIATION MONITORING	HP	N/A	YES	RADIATION MONITORS AND ALARMS REMAIN IN OPERATION AS DEEMED NECESSARY BY RADCON. SELECTED HP MONITORING AND SURVEY PROGRAMS ARE ALSO CONTINUED
ELECTRIC DISTRIBUTION	EE	N/A	N/A	ELECTRICAL EQUIPMENT WHICH SUPPORTS OPERABLE SYSTEMS AND FACILITIES SHALL REMAIN OPERATIONAL
LIGHTING & EMERGENCY LIGHTING	EL	N/A	N/A	AREA LIGHTING WILL BE AVAILABLE THROUGHOUT THE PLANT. EMERGENCY LIGHTING EXISTS TO PERMIT PERSONNEL EGRESS.
COMMUNICATIONS	COM	N/A	N/A	COMMUNICATIONS WILL BE OPERATIONAL TO THE EXTENT NECESSARY FOR PDMS ACTIVITIES
AUXILIARY BUILDING VENTILATION	AH	N/A	YES	VENTILATION WILL BE OPERATIONAL TO THE EXTENT NECESSARY FOR PDMS ACTIVITIES
FUEL HANDLING BUILDING VENTILATION	AH	N/A	YES	VENTILATION WILL BE OPERATIONAL TO THE EXTENT NECESSARY FOR PDMS ACTIVITIES
AIR INTAKE TUNNEL VENTILATION	AH	NO	NO	MAINTAINED ONLY AS A SUPPLY PATHWAY
COMPRESSED AIR SUPPLY	IA/SA	NO	NO	AIR-COOLED AIR COMPRESSORS USE PORTIONS OF INSTRUMENT AND SERVICE AIR SYSTEMS.
BUILDING INLEAKAGE	CS	NO	YES	WATERPROOFING WILL MINIMIZE IN-LEAKAGE TO THE EXTENT THAT ANY INLEAKAGE CAN BE ADEQUATELY HANDLED BY PERIODIC TRANSFER TO BUILDING SUMPS

CHAPTER 10
ADMINISTRATIVE FUNCTIONS
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10.5 ORGANIZATION

The organizational elements responsible for the PDMS phase of TMI-2 are shown on Figure 10.5-1. The specific responsibilities are discussed below. Additionally, the PDMS Technical Specifications prescribe specific requirements for staff qualifications, training, and the review and audit of TMI-2 activities.

As part of the sale of TMI-1, GPU Nuclear entered into an agreement with AmerGen for TMI-2 services. Under this agreement and as a contractor subject to GPU Nuclear's ultimate direction and control, AmerGen will provide all services, materials and equipment required to maintain TMI-2 in Post-Defueling Monitored Storage (PDMS). Services provided by AmerGen will meet all the requirements of the Safety Analysis Report, Technical Specifications and Quality Assurance Program. Services include:

- Management services;
- Operations, maintenance and testing;
- Radwaste operations;
- Quality Assurance;
- Radiation controls and health physics;
- Environmental controls;
- Security;
- Safety;
- Administrative services, including logistical support, information technology support and procurement services;
- Engineering and Licensing;
- Warehousing and housekeeping;
- Support services required in connection with the performance of routine corrective and preventative maintenance;
- Interface with the NRC as necessary in connection with inspections, audits, site visits or meetings;
- Maintain required NRC licensing documents for TMI-2; and
- Prepare regulatory correspondence for GPU Nuclear signature or file on behalf of GPU Nuclear, to the extent permitted under applicable NRC regulations, all documents required in connection with PDMS of TMI-2.

Figure 10.5-1 also shows the AmerGen organization which will provide the above services.

10.5.1. President and Chief Nuclear Officer

The President and Chief Nuclear Officer is responsible to the GPU Nuclear Board of Directors to provide top level direction on all activities associated with the safe and efficient management and oversight of all TMI-2 activities. This position also serves as the GPU Nuclear Cognizant Officer.

10.5.2 Vice President GPU Nuclear Oversight

The Vice President, GPU Nuclear Oversight is responsible to ensure the TMI-2 PDMS Quality Assurance program is maintained and implemented in accordance with the PDMS Quality Assurance Plans, and applicable policies and procedures, applicable laws, regulations, licenses and technical requirements. Additionally, he is responsible to manage, direct and provide support to the GPU Nuclear Employee Concerns Program and is the sponsor of the TMI-2/SNEC Oversight Committee.

10.5.3 GPU Nuclear Director Three Mile Island Unit 2 (TMI-2)

The GPU Nuclear Director, Three Mile Island Unit 2 (TMI-2) has the overall responsibility for the management of TMI-2 during PDMS.

10.5..4 GPU Nuclear Ombudsman

An Ombudsman is provided by GPU Nuclear as part of the company's Employee's Concerns Program. The Ombudsman reports to the Vice President GPU Nuclear Oversight, and if necessary has access to the GPU Nuclear Board of Directors.

This individual is accessible on a confidential basis, if desired, to anyone in the company or its contracted employees having a nuclear or radiation safety concern he or she considers is not being adequately addressed. The Ombudsman is empowered to investigate such matters, identify any needed action and seek its resolution. The Ombudsman will reply to the individual who raised the matter.

10.5.5 TMI-2/SNEC Oversight Committee

Independent oversight is provided by the TMI-2/SNEC Oversight Committee. This Committee serves to independently assure that the TMI-2 structures, systems and components are maintained so as to protect the health and safety of the workers, the public and the environment and to enable effective and efficient dismantlement and decommissioning in the future. The committee is sponsored by the Vice President GPU Nuclear Oversight.

10.5.6 Manager, PDMS

The Manager, PDMS has the first-level management responsibility for maintaining the TMI-2 PDMS condition. The Manager, PDMS is directly responsible for the operations and maintenance activities associated with the TMI-2 PDMS.

10.5.7 Organizational Commitments

TMI-2 License Amendment and Technical Specification Change Request No. 78, submitted to the NRC on April 6, 2000, requested organizational and administrative changes that will exist following the sale of the Oyster Creek Nuclear Generating Station to AmerGen. Attachment 3 to that submittal listed a number of commitments for TMI-2 and a general commitment to list the commitments in the PDMS SAR. The listing, as issued in TMI-2 Technical Specification Amendment No. 54, is as follows:

1. The GPU Nuclear Cognizant Officer will have overall responsibility for TMI-2. A description of responsibilities and qualifications for this position will be addressed in the PDMS Quality Assurance (QA) Plan.

2. A GPU Nuclear employee or third party contractor will be permanently assigned at the TMI site.

3. The Ombudsman will have access, if necessary, to the GPU Nuclear Board of Directors. The Ombudsman function will be described in the PDMS Quality Assurance Plan.

4. GPU Nuclear will periodically assess AmerGen performance with support from other GPU (owners group) organizations as needed (e.g. GPU Internal Audits, Contracts, Legal, etc.).

5. GPU Nuclear will establish a TMI-2/Saxton Nuclear Experimental Corporation (SNEC) Oversight Committee that will advise the GPU Nuclear Cognizant Officer. A description of responsibilities and qualifications will be addressed in the PDMS Quality Assurance Plan.

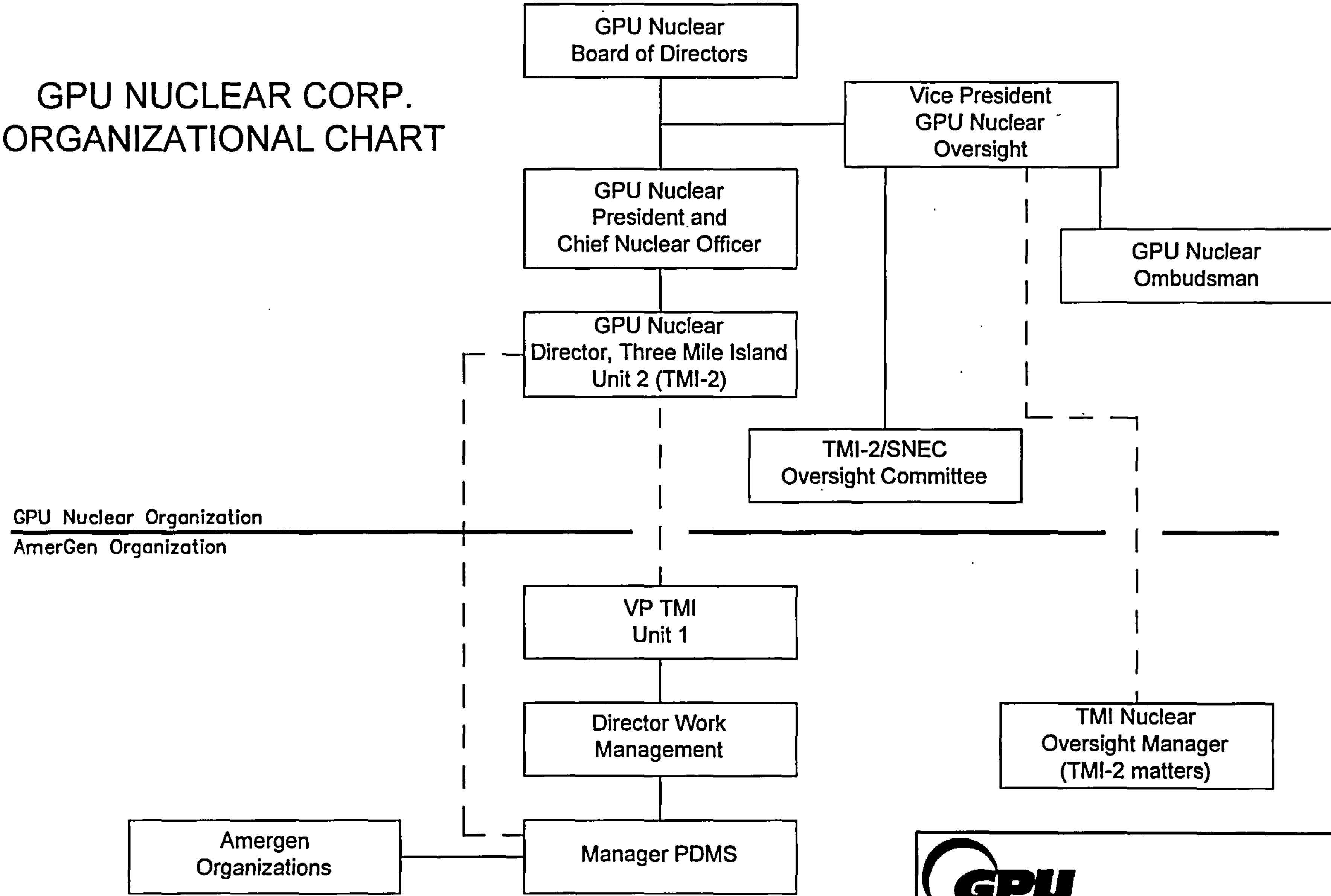
6. All Quality Assurance audit reports prepared by AmerGen for TMI-2 will be provided to the GPU Nuclear Cognizant Officer.

7. GPU Nuclear will conduct a periodic QA Plan audit of AmerGen. The audit and frequency will be specified in the GPU Nuclear PDMS Quality Assurance Plan.

8. A GPU Nuclear employee or third party contractor (ultimately responsible to GPU Nuclear) will review and approve all 10 CFR 50.59 evaluations unique to TMI-2 and all evaluations involving a TMI-2 facility change. This will be incorporated in the TMI Review and Approval Matrix.

9. A GPU Nuclear employee or third party contractor (ultimately responsible to GPU Nuclear) will review and approve proposed changes to the emergency preparedness program that are unique to TMI-2.

GPU NUCLEAR CORP. ORGANIZATIONAL CHART



GPU NUCLEAR TMI-2

GPU NUCLEAR CORP.
ORGANIZATIONAL CHART

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PDMS SAR UPDATE 6 – AUG. 2005
FIGURE: 10.5–1