TMI-2

POST DE-FUELING

MONITORED STORAGE

SAFETY ANALYSIS

REPORT

UPDATE 8
August 2009

TMI-2 POST-DEFUELING MONITORED STORAGE

SAFETY ANALYSIS REPORT

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A section of the York Haven Dam blocks the east channel of the Susquehanna River at Three Mile Island approximately one mile downstream from TMI-2. The York Haven Dam forms a pool extending approximately 3-1/2 miles upstream containing a volume of about 10,000 acre-feet. As long as the river flow is 20,000 cfs or less, all the flow discharges through the York Haven Hydro Plant tailrace into the lower section of Conewago Falls. When the river flow is above 20,000 cfs, the excess flow spills over the portion of the main dam upstream of the headrace wall and flows down through the Conewago Falls joining the flow from the tailrace at the foot of the dam; the full river flow then continues through the lower section of the falls. The exact extent of the mixing of TMINS effluents with the river depends on such factors as station discharge flowrate and the river flowrate. In 1980, an experiment was conducted which tracked the dispersion and dilution of a dye from the TMINS discharge. This study showed that plant discharge water and Susquehanna River water are typically 99% or greater mixed before intake by downstream users.

TMINS effluent releases are diluted by the effluent of the mechanical draft cooling towers by factors typically ranging from 167 times to 7600 times, depending upon the water intake from the river. The diluted radiological waste is further diluted by the flow of the Susquehanna River. At low flow (1700 cfs), the river would dilute the effluent by a factor of 20. However, at normal river flow (34,000 cfs), the dilution from the river would be 403 times. For effluent releases a minimum flow rate of 5000 gpm is maintained from the Mechanical Draft Cooling Towers, however, 8,000 gpm MDCT flow is always maintained during IWTS and/or IWFS releases (continuous releases). Dilution credit up to 38,000 gpm is taken for Mechanical Draft Cooling Tower effluent rates in FSAR calculations.

All users of surface water downstream of Three Mile Island are also downstream of York Haven Dam. Therefore, it is assured that mixing of station effluent and river water flow will occur prior to use.

2.4.5 GROUNDWATER

Three Mile Island Nuclear Station is located in the Triassic lowland of Pennsylvania, a region often referred to as the Gettysburg Basin. The island was formed as a result of fluvial deposition by the Susquehanna River. It is composed of sub-rounded to rounded sand and gravel, containing varying amounts of silt and clay. Soil depths vary from approximately 6 feet at the south of the island to about 30 feet at the center of the island. The site is underlain by Gettysburg shale which is at approximately 277 feet elevation.

There are two different water-bearing zones at TMINS. One is comprised of the unconsolidated materials overlying the Gettysburg shale (bedrock), and the other is comprised of the bedrock. Permeabilities in geologic materials on TMINS vary; however, groundwater discharges into the Susquehanna River and does not communicate with off-site groundwater supplies.

Hydrostatic pressure of the water table on the east and west shores of the river should prevent the island groundwater and the station discharge from communications with onshore groundwater. Therefore, groundwater effluents from TMINS cannot impact the quality of groundwater off-site. Additionally, the tritium concentrations in the TMINS groundwater are well below 10 CFR 20 regulatory limits and will not adversely affect the Susquehanna River.

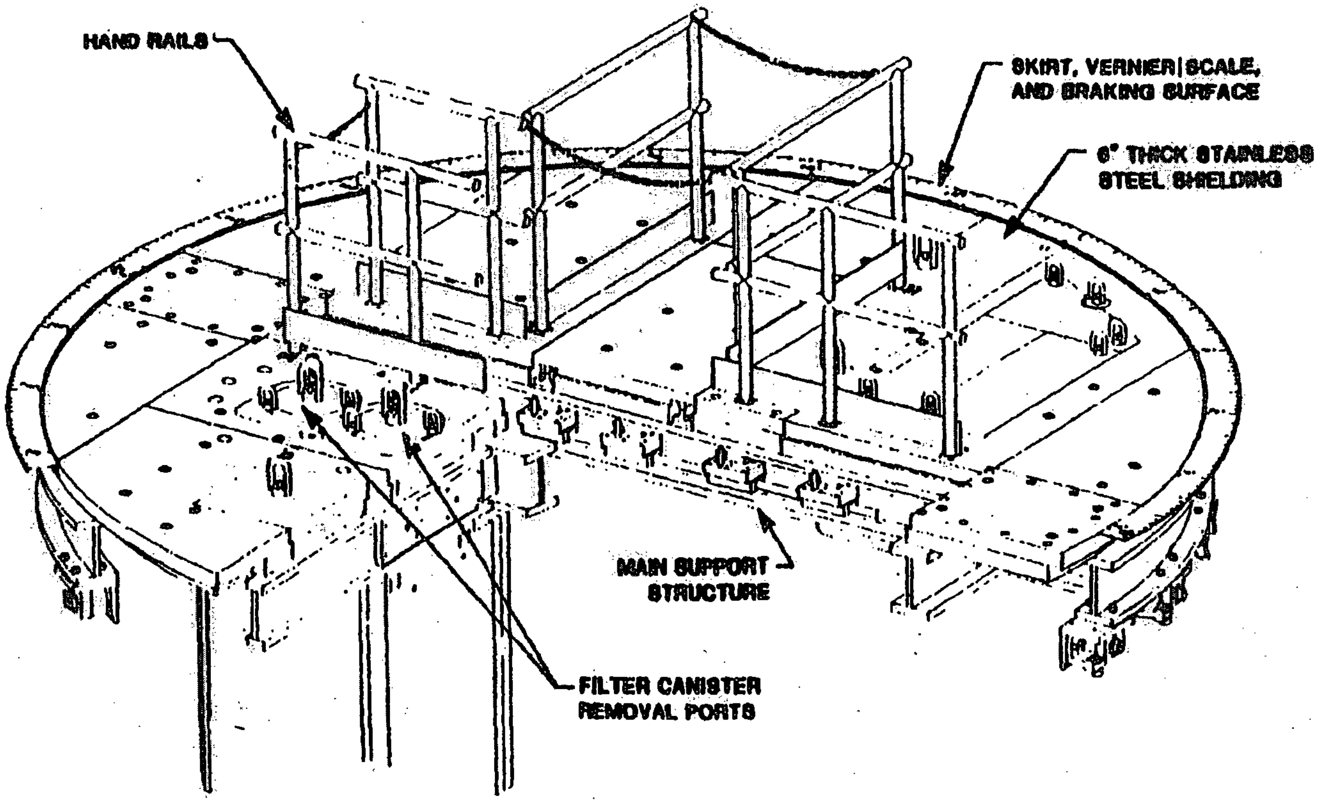
A more thorough description of the groundwater characteristics and related features are given in Section 2.4.13 of the Unit 2 FSAR.

2.4.6 EMERGENCY OPERATIONS REQUIREMENTS

2.4.6.1 Flood Protection

Although the flood protection design features of the station are based on the PMF, the emergency operational procedures are based on forecasts received from the Federal-State River Forecast Center, National Weather Service, State College, Pennsylvania. Communications are normally by phone or through civil defense radio as a backup.

The emergency procedure for the station will go into effect when the Federal-State River Forecast Center forecasts in 36 hours, a river flow of 350,000 cfs. A flood ALERT will be initiated when a 36 hour forecast of 640,000 cfs is received and a EMERGENCY CLOSURE when a 36 hour forecast of **900,000** cfs or greater is received. During the EMERGENCY CLOSURE, flood panels will be moved into place.



Shielded Work Platform Assembly

NOTE: For PDMS the handrails have been removed and a moisture/contamination barrier consisting of a lead brick chimney was installed on top of the platform. This chimney also provides access for a 0° to 200° F RTD suspended in the Reactor Vessel. The RTD has a remote digital readout in the Unit 2 Control Room.

7.1 OPERATIONAL FACILITIES

TMI-2 facilities required to be operational during PDMS are described in this section. Facilities are required to be operational to support operational systems within those facilities and/or to isolate internal contamination from the environment. Table 7.1-1 provides a listing of operational facilities for TMI-2 during PDMS. Each internally contaminated facility is identified along with any relevant remarks regarding the final layup of the facility.

Each of the following sections addresses the PDMS function of the facility, the facility description, and applicable evaluations. Additional reference information is listed in Section 7.3.

7.1.1 CONTAINMENT (REACTOR BUILDING)

7.1.1.1 PDMS Function

The primary function of the Containment during PDMS is as a contamination barrier. The Containment provides shielding of the environment from the contained radiation. It also provides the means to assure that any effluents from the Containment will be controlled, filtered, and monitored.

The Containment was designed to withstand approximately 60 psi of internal pressure, airplane crashes, a safe-shutdown-earthquake, tornado's, floods and other natural phenomena. The Containment was also designed with the capability to isolate any radioactive materials produced as a result of accidents or other unplanned events.

Although modifications were made to several of the Containment penetrations, (See Table 3.7-1) the structural capabilities of the Containment were not significantly diminished by the accident or any of the cleanup activities and are expected to be retained through the PDMS period. The Containment design and isolation capabilities relied upon during PDMS are described in the following sections.

7.1.1.2 Containment Structure

The Containment is a reinforced concrete structure composed of cylindrical walls with a flat foundation mat and a dome roof and lined with a carbon steel liner. The structure provides biological shielding for normal and unanticipated conditions. The steel liner encloses the equipment and systems which remain inside the Containment and ensures that an acceptable upper limit of leakage of radioactive material will not be exceeded under the worst unanticipated event.

The foundation slab is reinforced with conventional carbon steel reinforcing. The cylindrical walls are prestressed with a grouted tendon post-tensioning system in the vertical and horizontal directions. The dome roof is prestressed utilizing a three-way grouted tendon post-tensioning system. The inside surface of the Reactor Building is lined with carbon steel to ensure a high degree of leak tightness. The thickness of the liner plate is 3/8 in. for the cylinder, 1/2 in. for the dome and 1/4 in. for the base.

The foundation mat bears on the bedrock and is 11 feet 6 inches thick with an additional 2 foot thick concrete slab above the liner plate. The cylindrical portion has an inside diameter of 130 feet, wall thickness of 4 feet, and a height of 157 feet from the top of the foundation slab to the spring line. The roof is a shallow dome which has a large radius of 110 feet and a transition radius of 20 feet 6 inches.

7.1.1.3 Containment Functional Design

During PDMS, the Containment serves primarily as a contamination barrier and provides shielding from the radiation due to contained contamination. All effluents will be controlled, filtered, and monitored. The functional requirements for the Reactor Building during PDMS are listed below:

a. The Containment pressure will be maintained at equilibrium with atmospheric pressure by utilizing a passive ventilation system (see Containment Atmospheric Breather, Section 7.2.1.2) via the Auxiliary Building.

b. Containment isolation will be maintained by a single passive barrier either inside or outside of Containment on each Containment penetration. Active isolation capability is not required for PDMS **except for the Containment Atmospheric Breather and the RB Purge Containment valves.** Various passive means, or their equivalent, are acceptable for piping systems and include locked closed valves, closed and deactivated remote manual valves, closed and deactivated automatic valves, and blind flanges.

c. Monitoring of effluent releases will be provided by existing and/or additional monitoring equipment as designated in Section 7.2.4.

7.1.1.4 Facility Description

Systems within the Containment not required to be maintained in an operational condition during PDMS have been deactivated. The electric power circuits in the Containment have been deenergized except for those necessary for PDMS monitoring, inspection, and surveillance equipment, and other PDMS support requirements. Prior to each inspection inside the Containment, circuits will be energized to provide lighting and power for required equipment.

7.1.1.5 Evaluation

The Containment was originally designed to withstand airplane crashes, seismic events, tornadoes, floods, and other natural phenomena. Although there were modifications made during the cleanup period to several of the piping penetrations, these modifications were performed so that the structural integrity of the Containment has been maintained. Neither the accident nor any activity during the cleanup period has significantly degraded any of the structural capabilities of the Containment. Therefore, the Containment is structurally capable of withstanding the original design basis events (except internal pressurization) during the PDMS period without further analysis.

The internal pressure of the Containment during PDMS is controlled by a passive breather system (see Section 7.2.1.2). This system will maintain the Reactor Building in equilibrium with atmospheric pressure (via the Auxiliary Building) at all times during its use. In addition, a range of postulated events has been investigated (see Chapter 8) and none of these events could result in any significant pressurization of the Containment. Therefore, even with the reduced pressure capabilities due to the

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.

[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:

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

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, $f=64/R_e=64/(dV_v\rho/\mu)$, 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:

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

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:

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

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):

$$\dot{m}_v = (P_c - P_a) / \left[(128\mu/(\pi \rho g_c))(l/d^4) + (K/\rho) \right] \quad (4)$$

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

$$\dot{m}_l = (P_c - P_a) / \left[(128\mu/(\pi \rho g_c))(l/d^4) \right] \quad (5)$$

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.

$$0.0852\%/day = \dot{m}_l / M = \dot{m}_l / (\rho V)$$

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):

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

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:

$$\dot{m}_l / \dot{m}_v = \left[(128\mu/\pi g_c)(l/d^4)_{vent} + K \right] / \left[(128\mu/\pi g_c)(l/d^4)_{leak} \right] \quad (7)$$

with:

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

$$K = 0.312\ lb - sec/ft^5$$

This gives the ratio of mass flow rates as:

$$(\dot{m}_l / \dot{m}_v) = (0.00717 + 0.312)/3.89E5 = 0.000001$$

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

d. The Halon systems[2] protecting the Air Intake Tunnel have been deactivated by removing the Halon cylinders and deenergizing the ultraviolet and pressure detectors. The Halon system protecting the relay room has been deactivated by removing the cylinders. The heat sensitive wire fire detection system will remain operational to monitor these areas.

e. Portable fire extinguishers and self-contained breathing apparatus are staged with emergency response crew equipment. Additional portable fire extinguishers are located throughout the plant as needed to support work activities.

f. Transient combustibles inside the Containment and the AFHB have been removed to the maximum extent practical.

g. **Deleted.**

h. The charcoal filters have been removed from all HVAC systems in Unit 2.

i. The 12 in. fire service loop, which runs through the Diesel Generator Building, AFHB, Control Building area and Turbine Building (east and west), has been cut and capped off. The Diesel Generator Building has been turned over to TMI-1. Fire Service Water System standpipes have been configured to the East and West side of the Turbine Building which permits connection of the local fire hydrants to the 331' elevation of the Turbine Deck by way of staged fire hoses. This will allow responsive action by the Station Fire Brigade and or local Fire Departments.

j. DELETED

k. The station fire brigade is fully trained to assure that the personnel are familiar with system configurations, plant layout, and the procedures in Unit 2.

l. The Fire Protection Program and housekeeping inspections and their frequency are addressed in plant procedures.

[2]The air intake tunnel halon system was removed because the probability of an airplane crash in the vicinity of the air intake tunnel was estimated to be less than 2E-7/year and because of the presence of heat activated detectors.

7.2.2.3 Evaluation

The scope of fire protection has been reduced for areas in which systems have been deactivated and combustibles have been significantly reduced, so that the corresponding fire hazards have been minimized.

Deluge systems in the air/intake tunnel, the Auxiliary, the Turbine, and Control Buildings have been deactivated for PDMS. There are no deluge systems in the Containment.

Detection devices provide contacts for supervisory indication that each device is operational and, in the event of detector actuation, indicates the location where the wire detector actuated the alarm.

The station fire brigade is under the supervisory control of Unit 1. Upon detection of a fire in Unit 2, the station fire brigade will respond to the specific location in Unit 2. This response in accordance with ongoing station fire brigade training and procedures will ensure mitigation of a fire in Unit 2 during PDMS. The fire protection and suppression systems are configured to provide adequate capability to extinguish any potential fire during PDMS.

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 personnel access facility (PAF) 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 PAF. 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 PAF 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 **temperature element** located in the Control Room return air duct. The **temperature element** provides signals to a **programmable thermostat**, which controls heating or cooling as conditions dictate. Two steps of heating are available for freeze protection and **cooling is** 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.

CHAPTER 10

ADMINISTRATIVE FUNCTIONS

10.0 INTRODUCTION

The primary administrative functions necessary for the management of TMI-2 during PDMS are referenced in this chapter.

On December 23, 2008, the NRC issued an Order approving the transfer of the operating license for Three Mile Nuclear Station, Unit 1, held by AmerGen Energy Company, LLC, to Exelon Generation Company, LLC (Exelon Generation Company). Thus, any reference in this Section to Exelon Generation Company is made based on this Order.

10.2 SECURITY PLAN

The Code of Federal Regulations 10 CFR 50 and 10 CFR 73 define the security requirements for nuclear power plants. Due to the defueled and non-operating condition of TMI-2 during PDMS, the security requirements applicable to the facility are less than those that are applicable to an operating nuclear power plant. TMI-2 complies with all applicable security requirements. TMI-2 utilizes site physical security, guard training and qualification, and safeguards contingency plans maintained by TMI-1. These plans are administered and are under the authority of **Exelon Generation Company**, the TMI-1 License holder. The specific security provisions for TMI-2 are in the "TMI Modified Amended Physical Security Plan."

10.3 EMERGENCY PLAN

10 CFR 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. 10 CFR 50 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 releases and, 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. There exists only one Emergency Preparedness Plan for the TMI station. The Plan encompasses both TMI-1 and TMI-2 and is under the authority of **Exelon Generation Company**, the TMI-1 License holder.

The emergency plan for the TMI site incorporates all of the essential emergency planning requirements established by 10 CFR 50 Appendix E and other regulatory guidance. Since there are no events associated with TMI-2 which could result in a release approaching the levels established in the Protection Action Guide, the site emergency action levels are based on potential events which could occur at TMI-1. The site emergency facilities, such as the Emergency Control Center, the Technical Support Center, and the Operations Support Center are located in or in convenient proximity to TMI-1. All site personnel are trained and drilled to respond to any declared site emergency event

10.4 RADIATION PROTECTION PROGRAM

TMI-1 maintains a Radiation Protection Program which meets or exceeds standards for protection against exposures to radiation and radioactivity at the TMI site. There exists only one Radiation Protection Program for the TMI station. The Program encompasses both TMI-1 and TMI-2 and is under the authority of **Exelon Generation Company**, the TMI-1 License holder. The implementation of the Radiation Protection Program ensures that the facility will be managed and maintained during PDMS in a manner which minimizes risks to employees, contractors, visitors, and the public from exposure to radiation and radioactivity at the facility. The implementation of the program also ensures a radiologically safe working environment for employees and visitors at TMI-2.

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, **now Exelon Generation Company,** for TMI-2 services. Under this agreement and as a contractor subject to GPU Nuclear's ultimate direction and control, **Exelon Generation Company** will provide all services, materials and equipment required to maintain TMI-2 in Post-Defueling Monitored Storage (PDMS). Services provided by **Exelon Generation Company** 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.

On March 7, 2001 the NRC issued an Order approving the application regarding the proposed merger of GPU, Inc. and FirstEnergy Corp. As part of this order it was recognized that the holders of the TMI-2 license, GPU Nuclear, Metropolitan Edison Company, Jersey Central Power & Light Company and Pennsylvania Electric Company would become subsidiaries of FirstEnergy Corp. Thus any reference to FirstEnergy is made based on this relationship.

Figure 10.5-1 also shows the **Exelon Generation Company** 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 **FirstEnergy Nuclear Committee of the Board** 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 Plan, and applicable policies and procedures, applicable laws, regulations, licenses and technical requirements. Additionally, the **Vice President, GPU Nuclear Oversight** is responsible to manage, direct and provide support to the GPU Nuclear Employee Concerns Program and is the sponsor of the TMI-2 **Company Nuclear Review Board (CNRB).**

10.5.3 GPU Nuclear **Responsible Engineer** Three Mile Island Unit 2 (TMI-2)

The GPU Nuclear **Responsible Engineer,** Three Mile Island Unit 2 (TMI-2) has the overall responsibility for the management of TMI-2 during PDMS. **This overall responsibility may be shared by more than one individual.**

10.5.4 **Employee Concerns Program**

An Employee Concerns Program is provided for GPU Nuclear. The Vice President, GPU Nuclear Oversight, is responsible for the program and will appoint an individual to administer the program. If necessary this individual will have access to the Chief Nuclear Officer and FirstEnergy Nuclear Committee of the Board.

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. This individual is empowered to investigate such matters, identify any needed actions and seek its resolution. This individual will reply to the person who raised the concern.

10.5.5 TMI-2 **Company Nuclear Review Board (CNRB)**

Independent oversight is provided by the TMI-2 CNRB. **The CNRB** 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 **CNRB** 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, issued in TMI-2 Technical Specification Amendment No. 54 as modified to reflect current conditions, 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 is addressed in the PDMS Quality Assurance (QA) Plan.

2. A FirstEnergy employee or third party contractor will be assigned to the TMI site.

3. The individual responsible for the Employee Concerns Program will have access, if necessary, to the FirstEnergy Nuclear Committee of the Board. This function is described in the PDMS Quality Assurance Plan.

4. GPU Nuclear will periodically assess **Exelon Generation Company** 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 Company Nuclear Review Board that will advise the GPU Nuclear Cognizant Officer. A description of responsibilities and qualifications is addressed in the PDMS Quality Assurance Plan.

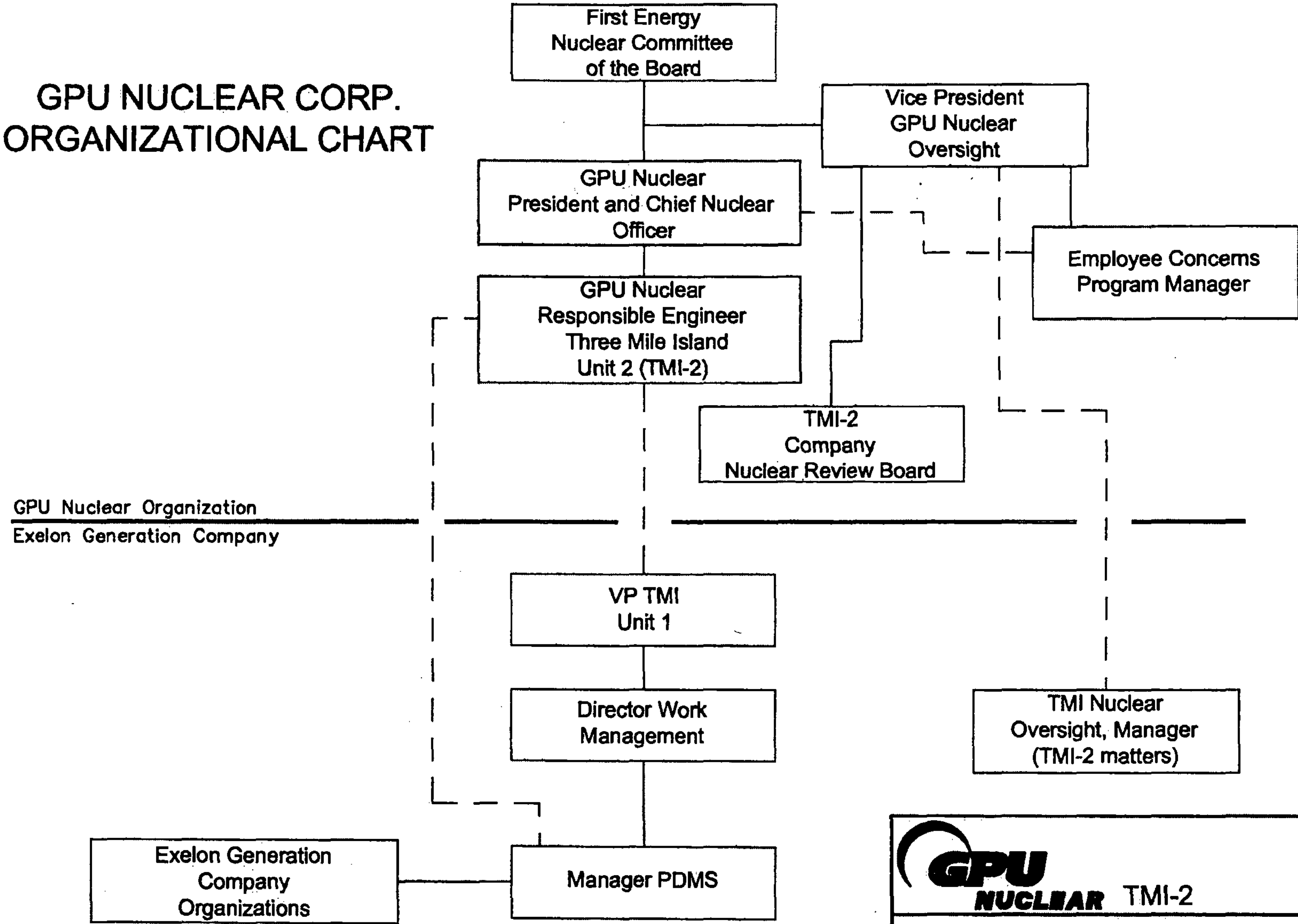
6. All Quality Assurance audit reports prepared by **Exelon Generation Company** for TMI-2 will be provided to the GPU Nuclear Cognizant Officer.

7. GPU Nuclear will conduct a periodic QA Plan audit of **Exelon Generation Company**. The audit and frequency is 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 is 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



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GPU NUCLEAR TMI-2

GPU NUCLEAR CORP.
ORGANIZATIONAL CHART

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FIGURE: 10.5–1	PAGE 10.5–4