

EXELON GENERATION COMPANY, LLC

(Three Mile Island Nuclear Station, Unit 1)

DOCKET NO. 50-289

RENEWED FACILITY LICENSE

Renewed License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission) having found that:
 - a. The application for a renewed license filed by the applicant complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter 1 and all required notifications to other agencies or bodies have been duly made;
 - b. DELETED
 - c. The facility will be maintained in conformity with the application, as amended, the provisions of the Act and the rules and regulations of the Commission;
 - d. There is a reasonable assurance: (1) that the activities authorized by this renewed license can be conducted without endangering the health and safety of the public, and (2) that such activities will be conducted in compliance with the rules and regulations of the Commission;
 - e. Exelon Generation Company, LLC (Exelon Generation Company) is technically and financially qualified to engage in the activities authorized by this renewed operating license in accordance with the rules and regulations of the Commission;
 - f. Exelon Generation Company has satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;
 - g. The issuance of this renewed license will not be inimical to the common defense and security or to the health and safety of the public;
 - h. After weighing the environmental, economic, technical, and other benefits of the facility against environmental costs and considering available alternatives, the issuance of Renewed Facility License No. DPR-50 is in accordance with 10 CFR Part 50, Appendix D, of the Commission's regulations and all applicable requirements of said Appendix D have been satisfied;

Amendment No. 297
Renewed License No. DPR-50

- i. The receipt, possession, and use of source, byproduct and special nuclear material as authorized by this license will be in accordance with the Commission's regulations in 10 CFR Parts 30, 40, and 70, including 10 CFR Section 30.33, 40.32, 70.23 and 70.31; and
 - j. Actions have been identified and have been or will be taken with respect to (1) managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under 10 CFR 54.21(a)(1); and (2) time-limited aging analyses that have been identified to require review under 10 CFR 54.21(c), such that there is reasonable assurance that the activities authorized by the renewed operating license will continue to be conducted in accordance with the current licensing basis, as defined in 10 CFR 54.3, for the facility, and that any changes made to the facility's current licensing basis in order to comply with 10 CFR 54.29(a) are in accordance with the Act and the Commission's regulations.
2. Renewed Facility License No. DPR-50 is hereby issued to Exelon Generation Company to read as follows:
- a. This renewed license applies to the Three Mile Island Nuclear Station, Unit 1, a pressurized water reactor and associated equipment (the facility), owned by Exelon Generation Company. The facility is located in Dauphin County, Pennsylvania, and is described in the "Updated Final Safety Analysis Report (UFSAR)" as supplemented and amended and the Environmental Report as supplemented and amended.
 - b. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses:
 - (1) Exelon Generation Company, pursuant to Section 104b of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess and use the facility as required for fuel storage in accordance with the procedures and limitations set forth in this renewed license;
 - (2) Exelon Generation Company, pursuant to the Act and 10 CFR Parts 30, 40 and 70 to possess at any time any byproduct, source and special nuclear material used previously as reactor fuel, sealed neutron sources used previously for reactor startup, as fission detectors, and sealed sources for reactor instrumentation and to possess and use at any time any byproduct, source and special nuclear material as sealed sources for radiation monitoring equipment calibration in amounts as required;
 - (3) Exelon Generation Company, pursuant to the Act and 10 CFR Parts 30, 40 and 70 to receive, possess at either TMI-1 or TMI-2, and use in amounts as required for TMI-1 any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis, testing, instrument calibration, or associated with radioactive apparatus or components. Other than radioactive apparatus and components to be used at TMI Unit 2 in accordance with the TMI-2 License, the radioactive apparatus and components that may be moved from TMI

Unit 1 to TMI Unit 2 under this provision shall be limited to: (1) outage-related items (such as contaminated scaffolding, tools, protective clothing, portable shielding and decontamination equipment); and (2) other equipment belonging to TMI Unit 1 when storage of such equipment at TMI-2 is deemed necessary for load handling or contamination control considerations;

- (4) Exelon Generation Company, pursuant to the Act and 10 CFR Parts 30 and 70, to possess at the TMI Unit 1 or Unit 2 site, but not separate, such byproduct and special nuclear materials that were produced by the operation of either unit. Radioactive waste may be moved from TMI Unit 2 to TMI Unit 1 under this provision for collection, processing (including decontamination), packaging, and temporary storage prior to disposal. Radioactive waste that may be moved from TMI Unit 1 to TMI Unit 2 under this provision shall be limited to: (1) dry active waste (DAW) temporarily moved to TMI Unit 2 during waste collection activities, and (2) contaminated liquid contained in shared system piping and tanks. Radioactive waste that may be moved from TMI Unit 1 to TMI Unit 2 under this provision shall not include spent fuel, spent resins, filter sludge, evaporator bottoms, contaminated oil, or contaminated liquid filters.

The storage of radioactive materials or radwaste generated at TMI Unit 2 and stored at TMI Unit 1 shall not result in a source term that, if released, would exceed that previously analyzed in the UFSAR in terms of off-site dose consequences.

The storage of radioactive materials or radwaste generated at TMI Unit 1 and stored at TMI Unit 2 shall not result in a source term that, if released, would exceed that previously analyzed in the PDMS SAR for TMI Unit 2 in terms of off-site dose consequences.

- c. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Section 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

- (1) DELETED

- (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 298, are hereby incorporated in the license. The Exelon Generation Company shall maintain the facility in accordance with the Permanently Defueled Technical Specifications (PDTS).

(3) Physical Protection

Exelon Generation Company shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822), and the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans¹, submitted by letter dated May 17, 2006, is entitled: "Three Mile Island Nuclear Station Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan, Revision 3." The set contains Safeguards Information protected under 10 CFR 73.21.

Exelon Generation Company shall fully implement and maintain in effect all provisions of the Commission-approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The Exelon Generation Company CSP was approved by License Amendment No. 275 and modified by License Amendment No. 288.

(4) DELETED

(5) DELETED

(6) Inservice Testing - DELETED

(7) Aircraft Movements - DELETED

(8) Repaired Steam Generators - DELETED

(9) Long Range Planning Program - DELETED

Sale and License Transfer Conditions

(10) DELETED

(11) DELETED

(12) DELETED

(13) DELETED

(14) DELETED

¹ The Training and Qualification Plan and Safeguards Contingency Plan are Appendices to the Security Plan.

(15) Exelon Generation Company shall take all necessary steps to ensure that the decommissioning trust is maintained in accordance with the application, the requirements of the Order Approving Transfer of License and Conforming Amendment, dated January 8, 2009, and the related Safety Evaluation dated December 23, 2008.

(16) DELETED

(17) Mitigation Strategy License Condition

The licensee shall develop and maintain strategies for addressing large fires and explosions and that include the following key areas:

(a) Fire fighting response strategy with the following elements:

1. Pre-defined coordinated fire response strategy and guidance
2. Assessment of mutual aid fire fighting assets
3. Designated staging areas for equipment and materials
4. Command and control
5. Training of response personnel

(b) Operations to mitigate fuel damage considering the following:

1. Protection and use of personnel assets
2. Communications
3. Minimizing fire spread
4. Procedures for implementing integrated fire response strategy
5. Identification of readily-available pre-staged equipment
6. Training on integrated fire response strategy
7. Spent fuel pool mitigation measures

(c) Actions to minimize release to include consideration of:

1. Water spray scrubbing
2. Dose to onsite responders

(18) DELETED

(19) DELETED

(20) DELETED

- (21) The UFSAR supplement, as revised, submitted pursuant to 10 CFR 54.21(d), describes certain future activities to be completed prior to and/or during the period of extended operation. The licensee shall complete these activities in accordance with Appendix A of NUREG-1928, "Safety Evaluation Report Related to the License Renewal of Three Mile Island, Unit 1," dated, October, 2009. The licensee shall notify the NRC in writing when activities to be completed prior to the period of extended operation are complete and can be verified by NRC inspection.
 - (22) Handling of irradiated fuel in the Spent Fuel Pool will not be permitted following implementation of the PDTS until a minimum of 60 days following the permanent shutdown.
- d. This license is effective as of the date of issuance and is effective until the Commission notifies the licensee in writing that the license is terminated.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Attachment: Appendix A, Technical
Specifications

Date of Issuance: October 22, 2009

LICENSE AUTHORITY FILE COPY

DO NOT REMOVE

THREE MILE ISLAND
NUCLEAR STATION
UNIT 1

LICENSE NO. DPR-50

APPENDIX A
TECHNICAL SPECIFICATIONS

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1. DEFINITIONS

The following terms are defined for uniform interpretation of these specifications.

1.1 ACTIONS

ACTIONS shall be that part of a Specification that prescribes required actions to be taken under designated Conditions within specified completion times.

1.2 CERTIFIED FUEL HANDLER

A CERTIFIED FUEL HANDLER is an individual who complies with provisions of the CERTIFIED FUEL HANDLER training program required by Specification 6.3.2.

1.3 NON-CERTIFIED OPERATOR

A NON-CERTIFIED OPERATOR is a non-licensed operator who complies with the qualification requirements of Specification 6.3.1, but is not a CERTIFIED FUEL HANDLER.

1.4 OPERABLE

A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s) and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

1.5 STATION, UNIT, PLANT, AND FACILITY

Station, unit, plant, and facility as used in these technical specifications all refer to TMI Unit 1.

3/4. LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.0 GENERAL ACTION REQUIREMENTS AND SURVEILLANCE REQUIREMENT APPLICABILITY

3.0.1 LCOs shall be met during the specified conditions in the TS, except as provided in 3.0.2.

3.0.2 Upon discovery of a failure to meet an LCO, the required actions of the associated Conditions shall be met.

If the LCO is met or is no longer applicable prior to expiration of the specified completion time(s), completion of the required action(s) is not required, unless otherwise stated.

4.0.1 Surveillance requirements shall be met during the specified conditions in the applicability for individual LCOs, unless otherwise stated in the surveillance requirements. Failure to meet a surveillance, whether such failure is experienced during the performance of the surveillance or between performances of the surveillance, shall be failure to meet the LCO. Failure to perform a surveillance within the specified frequency shall be failure to meet the LCO except as provided in 4.0.2.

4.0.2 If it is discovered that a surveillance was not performed within its specified frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified frequency, whichever is greater. This delay period is permitted to allow performance of the Surveillance. The delay period is only applicable when there is a reasonable expectation the surveillance will be met when performed.

If the surveillance is not performed within the delay period, the LCO must immediately be declared not met, and the applicable condition(s) must be entered.

When the surveillance is performed within the delay period and the surveillance is not met, the LCO must immediately be declared not met, and the applicable condition(s) must be entered.

4.0.3 The specified frequency for each SR is met if the surveillance is performed within 1.25 times the interval specified in the frequency, as measured from the previous performance.

BASES

LCO 3.0.1 and LCO 3.0.2, and SR 4.0.1 through SR 4.0.3 delineate the actions to be taken for circumstances not directly provided for in the action requirements of individual specifications and whose occurrence would violate the intent of the specification.

LCO 3.0.1 establishes the applicability statement within each individual specification as the requirement for when the LCO is required to be met (i.e., when the facility is in the specified conditions of the applicability statement of each Specification).

LCO 3.0.2 establishes that upon discovery of a failure to meet an LCO, the associated actions shall be met. The completion time of each required action for an ACTIONS condition is applicable from the point in time that an actions condition is entered. The required actions establish those remedial measures that must be taken within specified completion times when the requirements of an LCO are not met. This specification establishes that completion of the required actions within the specified completion times constitutes compliance with a specification.

Completing the required actions is not required when an LCO is met or is no longer applicable, unless otherwise stated in the individual specifications.

SR 4.0.1 establishes the requirement that SRs must be met during the specified conditions in the SRs for which the requirements of the LCO apply, unless otherwise specified in the individual SRs. This specification is to ensure that surveillances are performed in order to verify that facility conditions are within specified limits. Failure to meet a surveillance within the specified frequency constitutes a failure to meet an LCO.

Variables are assumed to be within limits when the associated SRs have been met. Nothing in this Specification, however, is to be construed as implying that variables are within limits when the requirements of the surveillance(s) are known not to be met between required surveillance performances.

Surveillances do not have to be performed when the unit is in a specified condition for which the requirements of the associated LCO are not applicable, unless otherwise specified. Unplanned events may satisfy the requirements (including applicable acceptance criteria) for a given SR. In this case, the unplanned event may be credited as fulfilling the performance of the SR. This allowance includes those SRs whose performance is normally precluded in a given specified condition.

Surveillances, including surveillances invoked by LCO required actions, do not have to be performed on inoperable equipment because the actions define the remedial measures that apply. Surveillances have to be met and performed in accordance with the specified frequency, prior to returning equipment to OPERABLE status.

SR 4.0.2 establishes the flexibility to defer declaring affected equipment inoperable or an affected variable outside the specified limits when a surveillance has not been performed within the specified frequency. A delay period of up to 24 hours or up to the limit of the specified frequency, whichever is greater, applies from the point in time that it is discovered that the required surveillance has not been performed in accordance with Surveillance Requirement 4.0.2 and not at the time that the specified frequency was not met.

The delay period provides an adequate time to perform surveillances that have been missed. This delay period permits the performance of a surveillance before complying with required actions or other remedial measures that might preclude performance of the surveillance.

The basis for this delay period includes consideration of facility conditions, adequate planning, availability of personnel, the time required to perform the surveillance, the safety significance of the delay in completing the required surveillance, and the recognition that the most probable result of any particular surveillance being performed is the verification of conformance with the requirements.

SR 4.0.2 is only applicable if there is a reasonable expectation the associated variables are within limits, and it is expected that the Surveillance will be met when performed. Many factors should be considered, such as the period of time since the Surveillance was last performed, or whether the Surveillance, or a portion thereof, has ever been performed, and any other indications, tests, or activities that might support the expectation that the Surveillance will be met when performed. The rigor of determining whether there is a reasonable expectation a Surveillance will be met when performed should increase based on the length of time since the last performance of the Surveillance. If the Surveillance has been performed recently, a review of the Surveillance history and equipment performance may be sufficient to support a reasonable expectation that the Surveillance will be met when performed. For Surveillances that have not been performed for a long period or that have never been performed, a rigorous evaluation based on objective evidence should provide a high degree of confidence that the equipment is OPERABLE. The evaluation should be documented in sufficient detail to allow a knowledgeable individual to understand the basis for the determination.

Failure to comply with specified surveillance frequencies is expected to be an infrequent occurrence. Use of the delay period established by Surveillance Standard 4.0.2 is a flexibility which is not intended to be used repeatedly to extend surveillance intervals. While up to 24 hours or the limit of the specified frequency is provided to perform the missed surveillance, it is expected that the missed surveillance will be performed at the first reasonable opportunity. If a surveillance is not completed within the allowed delay period, then the variable is considered outside the specified limits and the completion times of the required actions for the applicable LCO conditions begin immediately upon expiration of the delay period. If a surveillance is failed within the delay period, then the variable is outside the specified limits and the completion times of the required actions for the applicable LCO conditions begin immediately upon failure of the surveillance.

Completion of the surveillance within the delay period allowed by this specification, or within the completion time of the actions, restores compliance.

SR 4.0.3 permits a 25% extension of the interval specified in the frequency. This extension facilitates Surveillance scheduling and considers facility conditions that may not be suitable for conducting the Surveillance (e.g., other ongoing surveillance or maintenance activities).

The 25% extension does not significantly degrade the reliability that results from performing the Surveillance at its specified Frequency. This is based on the recognition that the most probable result of any Surveillance is the verification of conformance with the SRs.

3/4.1 HANDLING AND STORAGE OF IRRADIATED FUEL IN THE SPENT FUEL POOL

3/4.1.1 SPENT FUEL POOL WATER LEVEL

Applicability

Applies to the minimum level of water in the Spent Fuel Pool during handling of irradiated fuel in the Spent Fuel Pool.

Objective

Ensures that assumptions of Fuel Handling Accident are maintained during handling of irradiated fuel in the Spent Fuel Pool.

Specification

- 3.1.1.1 Maintain Spent Fuel Pool level greater than 342'4" elevation.
- 3.1.1.2 With Spent Fuel Pool level less than 342'4" elevation, immediately suspend handling of irradiated fuel in the Spent Fuel Pool.

SURVEILLANCE REQUIREMENTS

- 4.1.1.1 Verify Spent Fuel Pool level greater than or equal to 342'4" elevation every 7 days.

Bases

The top of fuel is at the 319'4" elevation. The FHA analysis assumes 23' of water above the fuel assemblies. This dictates a minimum elevation of water in the Spent Fuel Pool of 342'4". This specification provides the controls to ensure the assumptions of the accident analysis while fuel handling evolutions are in progress. This specification will have a SR 4.1.1.1 that will verify the Spent Fuel Pool water level on a frequency of 7 days.

The water contained in the spent fuel pool provides a medium for removal of decay heat from the stored fuel elements, normally via the spent fuel cooling system. The spent fuel pool water also provides shielding to reduce the general area radiation dose during both spent fuel handling and storage. The resultant 2-hour dose to a person at the exclusion area boundary and the 30-day dose at the low population zone are much less than 10 CFR 50.67 limits.

LCO 3.1.1.2 requires that when the water level in the SFP is lower than the required level, the movement of irradiated fuel assemblies in the SFP is to be "immediately" suspended. "Immediately" as used in this completion time means the required action should be pursued without delay and in a controlled manner, such that the suspension of this activity shall not preclude completion of movement of an irradiated fuel assembly to a safe position. This effectively precludes a spent fuel handling accident from occurring in the SFP when the level is below the required elevation.

Although maintaining adequate spent fuel pool water level is essential to both decay heat removal and shielding effectiveness, the Technical Specification minimum water level limit is based upon maintaining the pool's iodine retention-effectiveness consistent with that assumed

in the evaluation of the Post Permanent Shutdown FHA analysis. The Post Permanent Shutdown FHA analysis assumes that a minimum of 23 feet of water is maintained above the stored fuel. This assumption allows the use of the pool iodine decontamination factor of 200 used in the associated offsite dose calculation.

3/4.1.2 SPENT FUEL POOL BORON CONCENTRATION

Applicability

Applies to the minimum boron concentration in the Spent Fuel Pool during storage and handling of irradiated fuel in the Spent Fuel Pool.

Objective

Ensures that assumptions of Storage Limitations are maintained to prevent inadvertent criticality in the Spent Fuel Pool.

Specification

- 3.1.2.1 Maintain Spent Fuel Pool boron concentration greater than or equal to 600 ppm.
- 3.1.2.2 With Spent Fuel Pool boron concentration less than 600 ppm, immediately suspend handling of irradiated fuel in the Spent Fuel Pool and immediately restore boron concentration per 3.1.2.1.

SURVEILLANCE REQUIREMENTS

- 4.1.2.1 Verify Spent Fuel Pool boron concentration greater than or equal to 600 ppm every 7 days.

Bases

The acceptance criteria for the fuel storage pool criticality analyses is that a keff of < 0.95 must be maintained for all postulated events. The storage racks are capable of maintaining this keff with unborated pool water at a temperature yielding the highest reactivity (assuming the storage restrictions of LCO 3.1.3 are met). Most abnormal storage locations will not result in an increase in the keff of the racks. However, it is possible to postulate events, such as the mis-loading of an assembly with a burnup and enrichment combination outside the acceptable area in Figure 3.1.3-1 and 3.1.3-2, or dropping an assembly between the pool wall and the fuel racks, which could lead to an increase in reactivity. For such events, credit is taken for the presence of boron in the pool water since the NRC does not require the assumption of two unlikely, independent, concurrent events to ensure protection against a criticality accident (double contingency principle). The reduction in keff, caused by the boron more than offsets the reactivity addition caused by credible accidents. This specification will have a Surveillance Requirement SR 4.1.2.1 that will verify the Spent Fuel Pool Boron on a frequency of 7 days.

LCO 3.1.2.2 requires that when the SFP boron concentration is less than 600 ppm, the movement of irradiated fuel assemblies in the SFP is to be "immediately" suspended. "Immediately" as used in this completion time means the required action should be pursued without delay and in a controlled manner, such that the suspension of this activity shall not preclude completion of movement of an irradiated fuel assembly to a safe position. This effectively precludes a spent fuel handling accident from occurring in the SFP when the boron concentration is below the required level.

3/4.1.3 SPENT FUEL ASSEMBLY STORAGE

Applicability

Applies whenever any fuel assembly is stored in Storage Pool A or Storage Pool B of the Spent Fuel Pool.

Objective

Ensures that assumptions of Storage Limitations are maintained to prevent inadvertent criticality in the Spent Fuel Pool.

Specification

- 3.1.3.1 The combination of initial enrichment and burnup of each spent fuel assembly stored in Storage Pool A and Storage Pool B, shall be within the acceptable region of Figure 3.1.3-1 or 3.1.3-2.
- 3.1.3.2 When requirement of 3.1.3.1 is not met, immediately initiate action to move the noncomplying fuel assembly to an acceptable configuration.

SURVEILLANCE REQUIREMENTS

- 4.1.3.1 Verify by administrative means the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.1.3-1 or Figure 3.1.3-2 prior to storing irradiated spent fuel in the Spent Fuel Pool A or Spent Fuel Pool B.

Bases

The function of the spent fuel storage racks is to support safety analyses and protect spent fuel assemblies from the time they are placed in the pool until they are shipped offsite. The spent fuel assembly storage LCO was derived from the need to establish limiting conditions on fuel storage to assure sufficient safety margin exists to prevent inadvertent criticality. The spent fuel assemblies are stored entirely underwater in a configuration that has been shown to result in a reactivity of less than or equal to 0.95 under worse case conditions. The spent fuel assembly enrichment requirements in this LCO are required to ensure inadvertent criticality does not occur in the spent fuel pool. Inadvertent criticality within the fuel storage area could result in offsite radiation doses exceeding 10 CFR 50.67 limits.

LCO 3.1.3.2 requires that when LCO 3.1.3.1 is not met, "immediately" initiate action to move the noncomplying fuel assembly to an acceptable configuration. "Immediately" as used in this completion time means the required action should be pursued without delay and in a controlled manner, to reestablish the safety margins to prevent an inadvertent criticality.

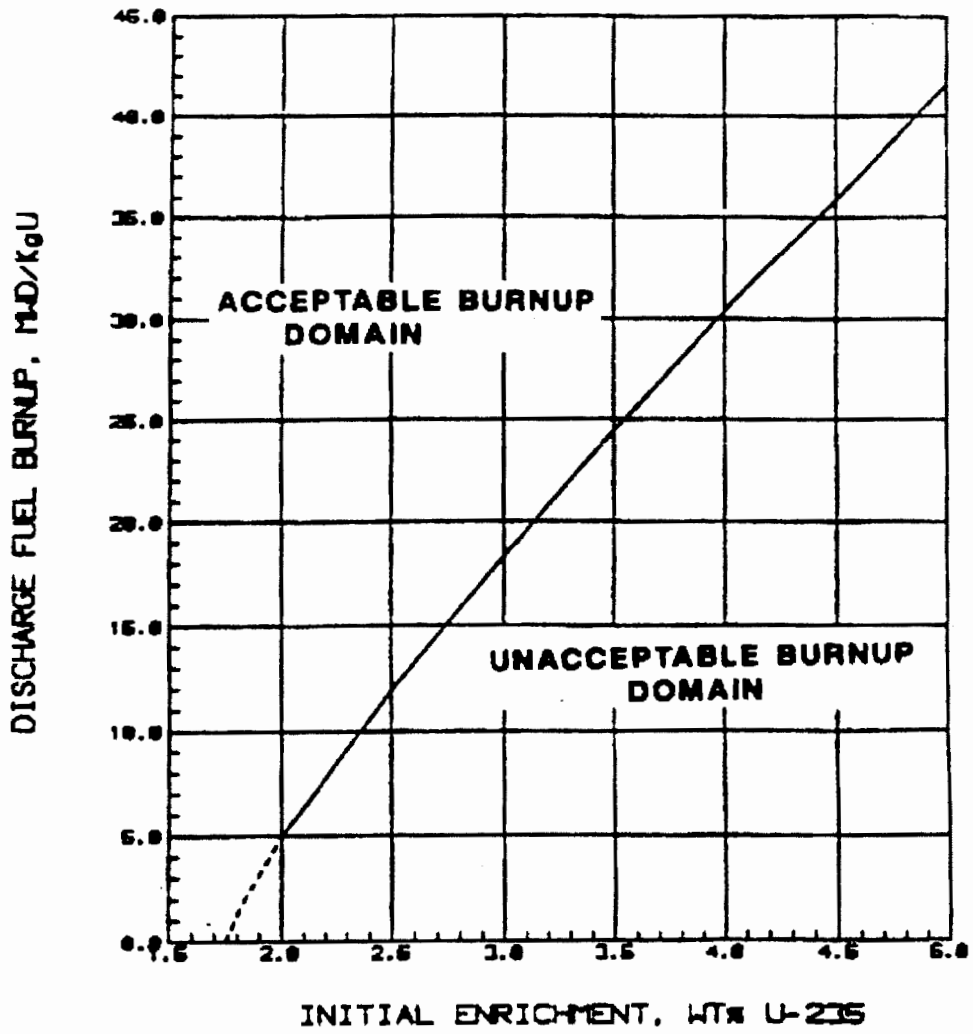


Figure 3.1.3-1
 Minimum Burnup Requirements for Fuel in Region II of the Pool A Storage Racks

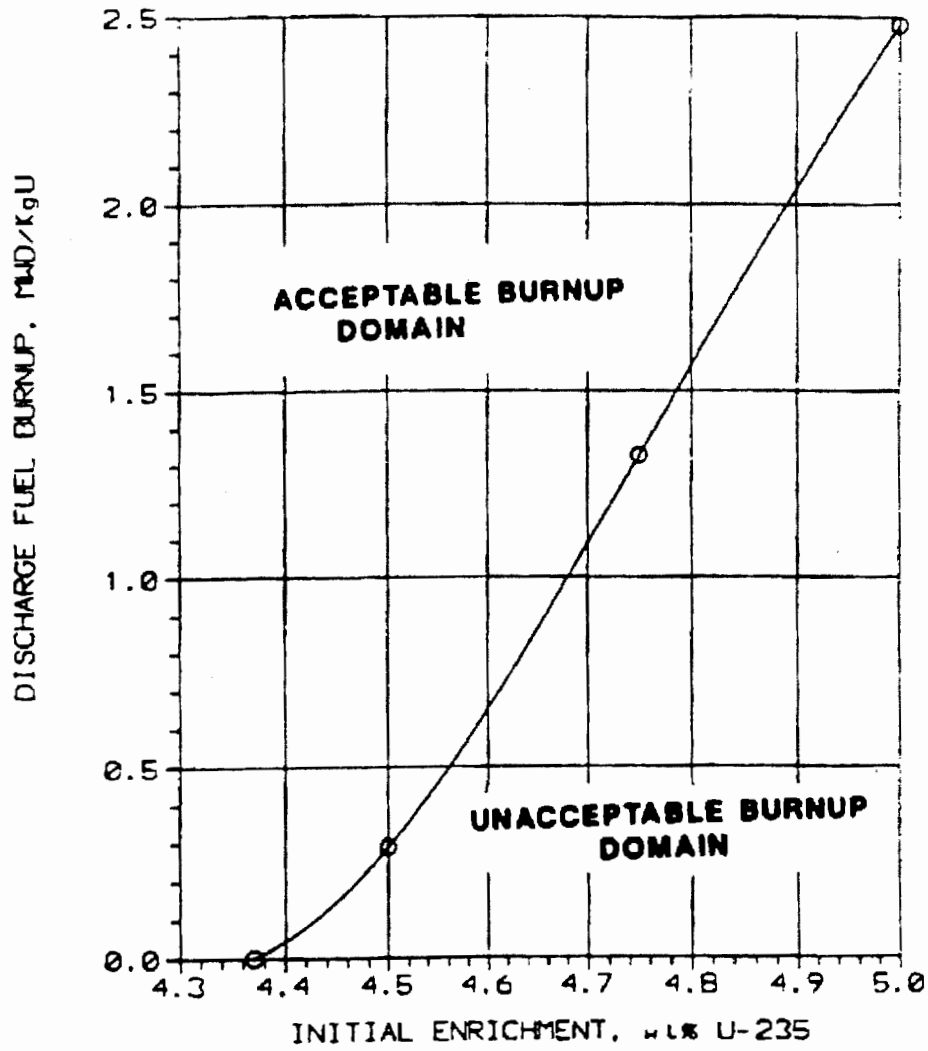


Figure 3.1.3-2
Minimum Burnup Requirements for Fuel in the Pool B Storage Racks

3/4.1.4 HANDLING OF IRRADIATED FUEL WITH THE FUEL HANDLING BUILDING CRANE

Applicability

Applies to the operation of the fuel handling building crane when within the confines of Unit 1 and there is any spent fuel in storage in the Unit 1 fuel handling building.

Objective

To define the lift conditions and allowable areas of travel when loads to be lifted and transported with the fuel handling building crane are in excess of 15 tons or between 1.5 tons and 15 tons or consist of irradiated fuel elements.

Specification

- 3.1.4.1 Spent fuel elements having less than 120 days for decay of their irradiated fuel shall not be loaded into a spent fuel transfer cask in the shipping cask area.
- 3.1.4.2 The key operated travel interlock system for automatically limiting the travel area of the fuel handling building crane shall be imposed whenever loads in excess of 15 tons are to be lifted and transported with the exception of fuel handling bridge maintenance.
- 3.1.4.3 The lowest surface of all loads in excess of 15 tons shall be administratively limited to an elevation one foot or less above the concrete surface at the nominal 348 ft-0 in. elevation in the fuel handling building.
- 3.1.4.4 Loads in excess of hook capacity shall not be lifted, except for load testing.
- 3.1.4.5 Following modifications or repairs to any of the load bearing members, the crane shall be subjected to a test lift of 125 percent of its rated load.
- 3.1.4.6 Administrative controls shall require the use of an approved procedure with an identified safe load path for loads in excess of 3,000 lbs. handled above the Spent Fuel Pool Operating Floor (348' elevation).
- 3.1.4.7 During transfer of the cask to and from the cask loading pit, the cask will be restricted to the transfer path shown in Figure 3.1.4-1. Administrative controls will be used to ensure that all lateral movements of the cask are performed at slow bridge and trolley speeds. During this transfer the cask lifting yoke shall be oriented in the East-West direction.

Bases

This specification will limit activity releases to unrestricted areas resulting from damage to spent fuel stored in the spent fuel storage pools in the postulated event of the dropping of a heavy load from the fuel handling building crane. A Fuel Handling accident analysis was performed assuming that the cask and its entire contents of ten fuel assemblies are sufficiently damaged as a result of dropping the cask, to allow the escape of all noble gases and iodine in the gap (Reference 1). This release was assumed to be directly to the atmosphere and to occur instantaneously. The site boundary doses resulting from this accident are 5.25 R whole body and 1.02 R to thyroid, and are within the limits specified in 10 CFR 100.

Specification 3.1.4.1 requires that spent fuel, having less than 120 days decay post-irradiation, not be loaded in a spent fuel transfer cask in order to ensure that the doses resulting from a highly improbable spent fuel transfer cask drop would be within those calculated above.

Specification 3.1.4.2 requires the key operated interlock system, which automatically limits the travel area of the fuel handling crane while it is lifting and transporting the spent fuel shipping cask, to be imposed whenever loads in excess of 15 tons are to be lifted and transported while there is any spent fuel in storage in the spent fuel storage pools in Unit 1. This automatically ensures that these heavy loads travel in areas where, in the unlikely event of a load drop accident, there would be no possibility of this event resulting in any damage to the spent fuel stored in the pools, any unacceptable structural damage to the spent fuel pool structure, or damage to redundant trains of safety related components. The shipping cask area is designed to withstand the drop of the spent fuel shipping cask from the 349 ft-0 in. elevation without unacceptable damage to the spent fuel pool structure (Reference 2).

Specification 3.1.4.3 ensures that the lowest surface of any heavy load never gets higher than one foot above the concrete surface of the 348 ft-0 in. elevation in the fuel handling building (nominal elevation 349 ft-0 in.) thereby keeping any impact force from an unlikely load drop accident within acceptable limits.

Specification 3.1.4.4 ensures that the proper capacity crane hook is used for lifting and transporting loads thus reducing the probability of a load drop accident.

Following modification or repairs, specification 3.1.4.5 confirms the load rating of the crane.

Specification 3.1.4.6 imposes administrative limits on handling loads weighing in excess of 3000 lbs. to minimize the potential for heavy loads, if dropped, to impact irradiated fuel in the spent fuel pool, or to impact redundant safe shutdown equipment. The safe load path shall follow, to the extent practical, structural floor members, beams, etc., such that if the load is dropped, the structure is

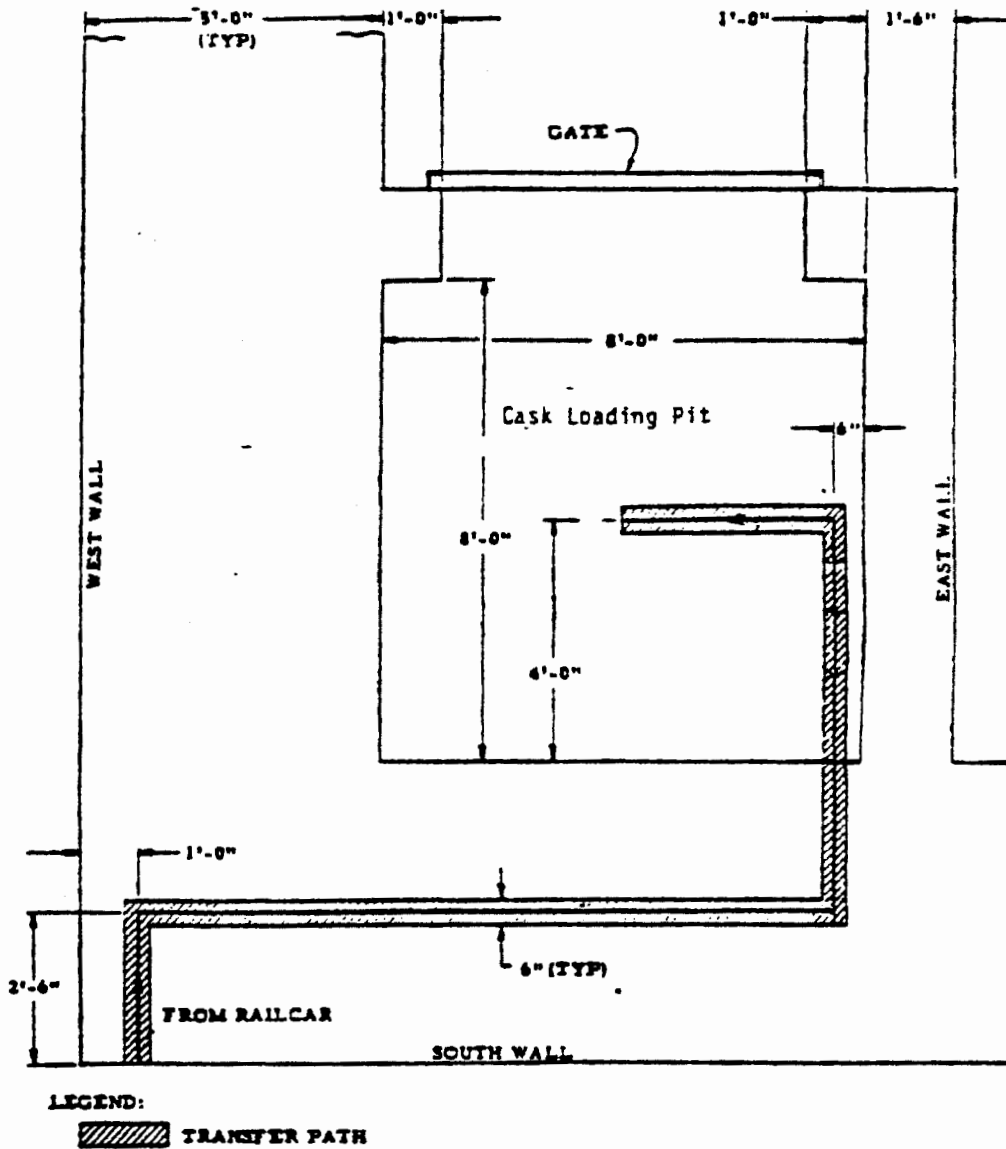
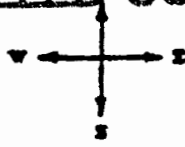
more likely to withstand the impact. Handling loads of less than 3000 lbs. without these restrictions is acceptable because the consequences of dropping loads in this weight range are comparable to those produced by the fuel handling accident considered in the FSAR and found acceptable.

Specification 3.1.4.7 in combination with 3.1.4.3 ensures the spent fuel cask is handled in a manner consistent with the load drop analysis (Reference 3).

References

- (1) UFSAR, Section 14.2.2.1 - "Fuel Handling Accident"
- (2) UFSAR, Section 14.2.2.8 - "Fuel Cask Drop Accident"
- (3) GPU Evaluation of Heavy Load Handling Operations at TMI-1
February 21, 1984, as transmitted to the NRC in GPUN Letter
No. 5211 84 2013.

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TRANSFER PATH TO AND FROM CASK LOADING PIT
(EL. 348"-0")
FIGURE 3.1.4-1

5.0 DESIGN FEATURES

5.1 SITE

Applicability

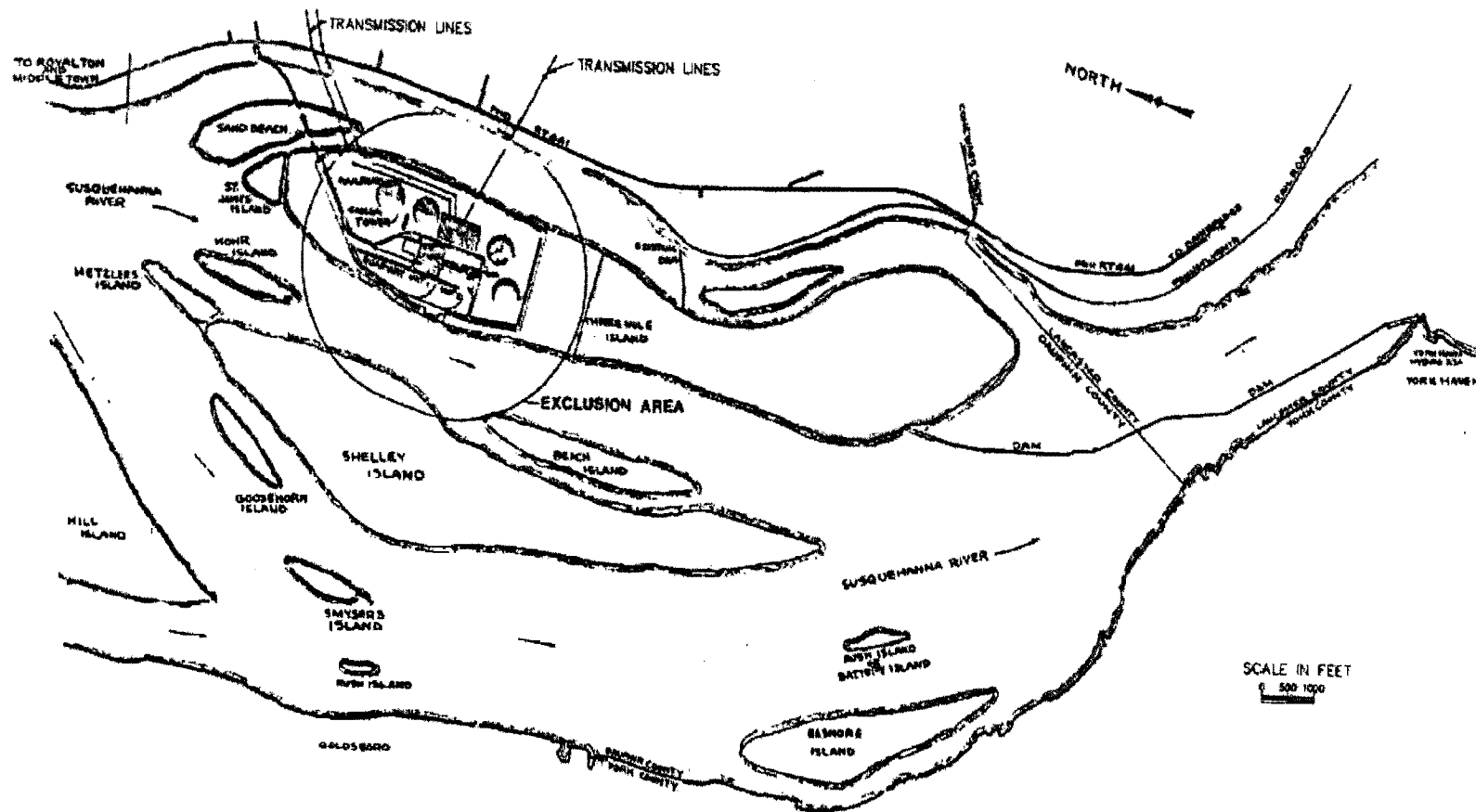
Applies to the location and extent of the exclusion boundary, restricted area, and low population zone.

Objective

To define the above by location and distance description.

Specification

- 5.1.1 The Three Mile Island Nuclear Station Unit 1 is located in an area of low population density about ten miles southeast of Harrisburg, PA. It is in Londonderry Township of Dauphin County, Pennsylvania, about two and one-half miles north of the southern tip of Dauphin County, where Dauphin is coterminous with York and Lancaster Counties. The station is located on an island approximately three miles in length situated in the Susquehanna River upstream from York Haven Dam. Figure 5-1 is an extended plot plan of the site showing the plant orientation and immediate surroundings. The description of the Exclusion Area as defined in 10 CFR 100.3, is located in the Final Safety Analysis Report, as updated.



Amendment No. 440, 216, 246 278

Exelon	
Three Mile Island Nuclear Station	
EXTENDED PLOT PLAN	
CAD FILE: 6717R1.DWG	FIG 5-1

5.2 SPENT FUEL STORAGE FACILITIES

Applicability

Applies to storage facilities for spent fuel assemblies.

Objective

To assure that spent fuel assemblies will be stored in such a manner that an inadvertent criticality could not occur.

Specification

5.2.1 SPENT FUEL STORAGE

For Spent Fuel Pool "A", the fuel assemblies are stored in racks in parallel rows, having a nominal center to center distance of 11.1 inches in both directions for the Region I racks and 9.2 inches in both directions for the Region II racks. The spacing in the Spent Fuel Pool "A" storage locations for both Region I and II is adequate to maintain Keff less than 0.95. Region I will store fuel with a maximum 5.0 percent initial enrichment. When fuel is being moved in or over the Spent Fuel Storage Pool "A" and fuel is being stored in the pool, a boron concentration of at least 600 ppm must be maintained to meet the NRC maximum allowable reactivity value under the postulated accident condition.

For Spent Fuel Pool "B", the fuel assemblies are stored in racks in parallel rows, having nominal center to center distance of 13-5/8 inches in both directions. This spacing is sufficient to maintain a Keff less than 0.95 based on fuel assemblies with a maximum enrichment of 4.37 weight percent U235. When fuel is being moved in or over the Spent Fuel Storage Pool "B" and fuel is being stored in the pool, a boron concentration of at least 600 ppm must be maintained to meet the NRC maximum allowable reactivity value under the postulated accident condition.

- a. Irradiated fuel assemblies will be stored, prior to offsite shipment, in the stainless steel lined spent fuel pools, which are located in the fuel handling building.
- b. The fuel assembly storage racks provided and the number of fuel elements each will store are listed by location below:

	Spent Fuel Pool A North End of Fuel Handling Building	Spent Fuel Pool B South End of Fuel Handling Building	Dry New Fuel Storage Area Fuel Handling Building
Fuel Assys.	1494 *	496	54
Cores	8.44	2.8	0.37

NOTE: * Includes three spaces for accommodating failed fuel containers.

- c. All of the fuel assembly storage racks provided are designed to Seismic Class 1 criteria to the accelerations indicated below:

Fuel Handling Building
Dry New Fuel Storage Area
And Spent Fuel Pool A

Fuel Handling
Building Spent
Fuel Pool B

Horiz.	0.38 g
Vertical	0.25 g

**
**

NOTE: ** The "B" pool fuel storage racks are designed using the floor response spectra of the Fuel Handling Building.

REFERENCES

- (1) UFSAR, Section 9.7 - "Fuel Handling System"

6.0 ADMINISTRATIVE CONTROLS

6.1 RESPONSIBILITY

6.1.1 The Plant Manager shall be responsible for TMI-1 operations and shall delegate the succession of his responsibilities in writing during his absence.

6.1.2 The Shift Manager shall be responsible for the shift command function.

6.2 ORGANIZATION

6.2.1 ONSITE AND OFFSITE ORGANIZATIONS

Onsite and offsite organization shall be established for facility staff and corporate management. The onsite and offsite organization shall include the positions for activities affecting the safe storage and handling of spent nuclear fuel.

- a. Lines of authority, responsibility and communication shall be established and defined from the highest management levels through intermediate levels to and including facility organization positions. These relationships shall be documented and updated as appropriate, in the form of organizational descriptions. These organizational descriptions will be documented in the Updated FSAR and updated in accordance with 10 CFR 50.71e.
- b. The Plant Manager shall be responsible for overall facility safe operation and shall have control over those on-site activities necessary for safe storage and maintenance of spent nuclear fuel.
- c. A responsible officer shall have corporate responsibility for the safe storage and handling of spent nuclear fuel and shall take measures to ensure acceptable performance of the staff in operating, maintaining, and providing technical support to the facility to ensure safe management of spent nuclear fuel.
- d. Individuals who train the CERTIFIED FUEL HANDLERS and those who carry out the health physics and quality assurance functions may report to the appropriate manager on site; however, these individuals shall have sufficient organizational freedom to ensure their ability to perform their assigned functions.

6.2.2 FACILITY STAFF

The facility staff organization shall meet the following:

- a. Each on-duty shift shall be composed of at least one Shift Manager and one NON-CERTIFIED OPERATOR.
- b. At all times when nuclear fuel is stored in the spent fuel pool, at least one person qualified to stand watch in the control room (NON-CERTIFIED OPERATOR or CERTIFIED FUEL HANDLER) shall be present in the control room.
- c. The NON-CERTIFIED OPERATOR position may be filled by a CERTIFIED FUEL HANDLER.
- d. The Shift Manager shall be a CERTIFIED FUEL HANDLER.
- e. An individual qualified in radiation protection procedures shall be on site during movement of fuel and during the movement of loads over the fuel. The position may be vacant for a period of time not to exceed 2 hours in order to accommodate unexpected absence provided immediate action is taken to fill the required positions.
- f. Oversight of fuel handling operations shall be provided by a CERTIFIED FUEL HANDLER.

- g. Except for the Shift Manager, shift crew composition may be one less than the minimum requirement of Specification 6.2.2.a for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements and the following conditions are met:

- 1) No fuel movement is in progress;
- 2) No movement of loads over the spent fuel is in progress.

This provision does not permit any shift crew position to be unstaffed upon shift change due to an incoming shift crewman being late or absent.

6.3 FACILITY STAFF QUALIFICATIONS

6.3.1 Each member of the facility staff shall meet or exceed the minimum qualifications referenced for comparable positions specified in the Exelon Decommissioning Quality Assurance Program (DQAP).

6.3.2 The NRC-approved training and retraining program for CERTIFIED FUEL HANDLERs shall be maintained.

6.4 DELETED

6.5 DELETED

6.6 DELETED

6.7 DELETED

6.8 PROCEDURES AND PROGRAMS

6.8.1 Written procedures shall be established, implemented and maintained covering the items referenced below:

- a. The procedures applicable to safe storage of nuclear fuel recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978.
- b. Surveillance and test activities of equipment that affects nuclear safety and radioactive waste management equipment.
- c. Fuel Handling Operations.
- d. Security Plan Implementation.
- e. Fire Protection Program Implementation.
- f. Emergency Plan Implementation.
- g. Process Control Program Implementation.
- h. Offsite Dose Calculation Manual Implementation.
- i. Quality Assurance Program for effluent and environmental monitoring using the guidance in Regulatory Guide 4.15, Revision 1.

6.8.2 Further, each procedure required by 6.8.1 above, and substantive changes thereto, shall be reviewed and approved prior to implementation and shall be reviewed periodically as set forth in administrative procedures.

6.8.3 Temporary changes to procedures of 6.8.1 above may be made provided:

- a. The intent of the original procedure is not altered;
- b. The change is approved by two members of the licensee's management staff knowledgeable in the area affected by the procedure. For changes which may affect the operational status of facility systems or equipment, at least one of these individuals shall be a member of operations management or supervision who is a CERTIFIED FUEL HANDLER.
- c. The change is documented, reviewed and approved within 14 days of implementation.

6.8.4 a. Radiological Environmental Monitoring Program

A program shall be provided to monitor the radiation and radionuclides in the environs of the plant. The program shall provide (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. The program shall (1) be contained in the ODCM, (2) conform to the guidance of Appendix I to 10 CFR Part 50, and (3) include the following:

- (1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM,

b. Radioactive Effluent Controls Program

A program shall be provided conforming with 10 CFR 50.36a for the control of radioactive effluents and for maintaining the doses to members of the public from radioactive effluents as low as reasonably achievable. The program (1) shall be contained in the ODCM, (2) shall be implemented by operating procedures, and (3) shall include remedial actions to be taken whenever the program limits are exceeded. The program shall include the following elements:

- (1) Limitations on the operability of radioactive liquid and gaseous monitoring instrumentation including surveillance tests and setpoint determination in accordance with the methodology in the ODCM,
- (2) Limitations on the concentrations of radioactive material released in liquid effluents to unrestricted areas conforming to 10 times the concentrations specified in 10 CFR Part 20.1001 - 20.2402, Appendix B, Table 2, Column 2,
- (3) Monitoring, sampling, and analysis of radioactive liquid and gaseous effluents in accordance with 10 CFR 20.1302 and with the methodology and parameters in the ODCM,

b. Radioactive Effluent Controls Program (continued)

- (4) Limitations on the annual and quarterly doses or dose commitment to a member of the public from radioactive materials in liquid effluents released from the unit to the site boundary conforming to Appendix I to 10 CFR Part 50,
- (5) Determination of cumulative dose contributions from radioactive effluents for the current calendar quarter and current calendar year in accordance with the methodology and parameters in the ODCM at least every 31 days. Determination of projected dose contributions from radioactive effluents in accordance with the methodology in the ODCM at least every 31 days.
- (6) Limitations on the operability and use of the liquid and gaseous effluent treatment systems to ensure that the appropriate portions of these systems are used to reduce releases of radioactivity when the projected doses in a 31-day period would exceed 2 percent of the guidelines for the annual dose or dose commitment conforming to Appendix I to 10 CFR Part 50,
- (7) Limitations on the dose rate resulting from radioactive material released in gaseous effluents to areas at, or beyond, the site boundary. The limits are as follows:
 - (a) For noble gases: less than or equal to 500 mrem/yr to the total body and less than or equal to 3000 mrem/yr to the skin, and
 - (b) For I-131, I-133, tritium and all radionuclides in particulate form with half lives greater than 8 days: less than or equal to 1500 mrem/yr to any organ.
- (8) Limitations on the annual and quarterly air doses resulting from noble gases released in gaseous effluents from the unit to areas beyond the site boundary conforming to Appendix I to 10 CFR Part 50,
- (9) Limitations on the annual quarterly doses to a member of the public from Iodine-131, Iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from the unit to areas beyond the site boundary conforming to Appendix I to 10 CFR Part 50, and
- (10) Limitations on the annual dose or dose commitment to any member of the public due to releases of radioactivity and to radiation from uranium fuel cycle sources conforming to 40 CFR Part 190.

6.9 REPORTING REQUIREMENTS

In addition to the applicable reporting requirements of Title 10, Code of Federal Regulations, the following identified reports shall be submitted to the Administrator of the NRC Region 1 Office unless otherwise noted.

6.9.1 Routine Reports

A. Annual Reports. Annual reports covering the activities of the unit as described below during the previous calendar year shall be submitted prior to March 1 of each year. (A single submittal maybe made for the station. The submittal should combine those sections that are common to both units at the station.)

1. The following information on aircraft movements at the Harrisburg International Airport:
 - a. The total number of aircraft's movements (takeoffs and landings) at the Harrisburg International Airport for the previous twelve-month period.
 - b. The total number of movements of aircraft larger than 200,000 pounds at the Harrisburg International Airport for the previous twelve-month period, broken down into scheduled and non-scheduled (including military) takeoffs and landings, based on a current estimate provided by the airport manager or his designee.

6.9.2 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

6.9.2.1 The Annual Radiological Environmental Operating Report covering the facility during the previous calendar year shall be submitted prior to May 1 of each year.

The Report shall include summaries, interpretations, and an analysis of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in: (1) the ODCM; and, (2) Sections IV.B.2, IV.B.3, and IV.C of Appendix I to 10 CFR Part 50.

Note: A single submittal may be made for the station.

6.9.3 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

- 6.9.3.1 The Annual Radioactive Effluent Release Report covering the facility during the previous calendar year shall be submitted prior to May 1 of each year.

The Report shall include a summary of the quantities of radioactive liquid and gaseous effluent and solid waste released from the unit. The material provided shall be: (1) consistent with the objectives outlined in the ODCM and Process Control Program (PCP); and, (2) in conformance with 10 CFR 50.36(a) and Section IV.B.1 of Appendix I to 10 CFR Part 50.

Note: A single submittal may be made for the station. The submittal should combine those sections that are common to both units at the station.

6.10 RECORD RETENTION

- 6.10.1 Records shall be retained as described by the Decommissioning Quality Assurance Program.

6.11 DELETED

6.12 HIGH RADIATION AREA

Pursuant to 10 CFR Part 20, paragraph 20.1601(c), in lieu of the requirements of paragraph 20.1601(a) and 20.1601(b) of 10 CFR Part 20:

- 6.12.1 Access to each high radiation area, as defined in 10 CFR 20, in which an individual could receive a deep dose equivalent > 0.1 rem in one hour (at 30 centimeters from the radiation source or from any surface penetrated by the radiation) shall be controlled as described below to prevent unauthorized entry.
- a. Each area shall be barricaded and conspicuously posted as a high radiation area. Such barricades may be opened as necessary to permit entry or exit of personnel or equipment.
 - b. Entrance shall be controlled by requiring issuance of a Radiation Work Permit (RWP) or equivalent that includes specification of radiation dose rate in the immediate work area(s) and other appropriate radiation protection equipment and measures.
 - c. Individuals qualified in radiation protection procedures or personnel continuously escorted by such individuals may, for the performance of their assigned duties in high radiation areas, be exempt from the preceding requirements for issuance of an RWP or equivalent provided they are otherwise following plant radiation protection procedures for entry into, exit from, and work in such high radiation areas.

- d. Each individual or group of individuals permitted to enter such areas shall possess, or be accompanied by, one or more of the following:
 1. A radiation monitoring device that continuously indicates the radiation dose rate in the area.
 2. A radiation monitoring device that continuously integrates the radiation dose rate in the area and alarms when a preset setpoint is reached. Entry into high radiation areas with this monitoring device may be made after the dose rate in the area has been determined and personnel have been made knowledgeable of it.
 3. A radiation monitoring device that continuously transmits dose rate and cumulative dose information to a remote receiver monitored by radiation protection personnel responsible for controlling personnel radiation exposure within the area.
 4. An individual qualified in radiation protection procedures equipped with a radiation dose rate monitoring device. This individual shall be responsible for providing positive radiation protection control over the activities within the area and shall perform periodic radiation surveillance at the frequency specified by radiation protection supervision.

6.12.2 In addition to the requirements of Specification 6.12.1, high radiation areas in which an individual could receive a deep dose equivalent > 1.0 rem in one hour (at 30 centimeters from the radiation source or from any surface penetrated by the radiation), but less than 500 rads/hour (at 1 meter from the radiation source or from any surface penetrated by the radiation) shall be provided with a locked or continuously guarded door, or gate, or equivalent to prevent unauthorized entry.

- a. The keys to such locked doors or gates, or equivalent, shall be administratively controlled in accordance with a program approved by the radiation protection manager.
- b. Doors and gates, or equivalent, shall remain locked except during periods of access by personnel under an approved RWP, or equivalent, to ensure individuals are informed of the dose rate in the immediate work areas prior to entry.
- c. Individual high radiation areas in which an individual could receive a deep dose equivalent > 1.0 rem in one hour (at 30 centimeters from the radiation source or from any surface penetrated by the radiation), accessible to personnel, that are located within larger areas where no enclosure exists to enable locking, or that are not continuously guarded, and where no lockable enclosure can be reasonably constructed around the individual area require both of the following access controls:
 1. Each area shall be barricaded and conspicuously posted.
 2. A flashing light shall be activated as a warning device.

6.13 DELETED

6.14 OFFSITE DOSE CALCULATION MANUAL (ODCM)

6.14.1 Licensee initiated changes to the ODCM:

1. Shall be submitted to the NRC in the Annual Radioactive Effluent Release Report for the period in which the changes were made. This submittal shall contain:
 - a. sufficiently detailed information to justify the changes without benefit of additional or supplemental information;
 - b. a determination that the changes did not reduce the accuracy or reliability of dose calculations or setpoint determinations; and
 - c. documentation that the changes have been reviewed and approved pursuant to 6.8.2.
2. Shall become effective upon review and approval by licensee management.

6.15 DELETED

6.16 DELETED

6.17 DELETED

6.18 TECHNICAL SPECIFICATIONS (TS) BASES CONTROL PROGRAM

This program provides a means for processing changes to the Bases of these Technical Specifications.

- a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.
- b. Licensees may make changes to Bases without prior NRC approval provided the changes do not require either of the following:
 1. A change in the TS incorporated in the license or
 2. A change to the updated FSAR (UFSAR) or Bases that requires NRC approval pursuant to 10 CFR 50.59.
- c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the UFSAR.
- d. Proposed changes that meet the criteria of Specification 6.18.b.1 or 6.18.b.2 above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e).

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THREE MILE ISLAND
NUCLEAR STATION
UNIT 1

LICENSE NO. DPR-50

APPENDIX B
TECHNICAL SPECIFICATIONS

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