UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 7, 2012

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 - ISSUANCE OF AMENDMENT RE: ADMISTRATIVE TECHNICAL SPECIFICATION CHANGES (TAC NO. ME7357)

Dear Mr. Pacilio:

The Commission has issued the enclosed Amendment No. 278 to Renewed Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit 1 (TMI-1), in response to your application dated October 18, 2011[1], as supplemented by additional letters[2].

The amendment involves administrative changes. The changes include correcting typographical errors, making format changes, clarifying symbols and pages, reformatting of previously deleted pages, incorporating a consistent abbreviation of average reactor coolant temperature, deleting notes that are no longer applicable, and replacing certain drawing figures with versions that have a corrected title block.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

Peter Bamford

Peter J. Bamford, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosures: 1. Amendment No. 278 to DPR-50
2. Safety Evaluation

cc w/encl: Distribution via Listserv

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1. Agencywide Documents Access and Management System (ADAMS) Accession No. ML112911548.
2. January 20, 2012 (ADAMS Accession No. ML12020A091) and April 11, 2012 (ADAMS Accession No. ML12102A134).

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**WASHINGTON, D.C. 20555-0001**

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 278
License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission or NRC) has found that:

   A. The application for amendment by Exelon Generation Company, LLC (the licensee), dated October 18, 2011[1], as supplemented by additional letters[2] 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 I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.c.(2) of Renewed Facility Operating License No. DPR-50 is hereby amended to read as follows:

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1. Agencywide Documents Access and Management System (ADAMS) Accession No. ML112911548.
2. January 20, 2012 (ADAMS Accession No. ML12020A091) and April 11, 2012 (ADAMS Accession No. ML12102A134).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.278 , are hereby incorporated in the license. The Exelon Generation Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective immediately and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Meena Khanna, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the License and
Technical Specifications

Date of Issuance: May 7, 2012

ATTACHMENT TO LICENSE AMENDMENT NO. 278

RENEWED FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

Replace the following page of the Renewed Facility Operating License with the revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

| Remove | Insert |
|---|---|
| Page 4 | Page 4 |

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

| Remove | Insert |
|---|---|
| i | i |
| ii | ii |
| iii | iii |
| iv | iv |
| v | v |
| 1-1 | 1-1 |
| 1-3 | 1-3 |
| 2-4b | 2-4b |
| 2-12 | 2-12 |
| 3-1a | 3-1a |
| 3-3 | 3-3 |
| 3-6 | 3-6 |
| 3-18 | 3-18 |
| 3-18g | 3-18g |
| 3-21 | 3-21 |
| 3-22 | 3-22 |
| 3-23 | 3-23 |
| 3-33 | 3-33 |
| 3-35 | 3-35 |
| 3-36b | 3-36b |
| 3-41 | 3-41 |
| 3-43 | 3-43 |
| 3-62e | 3-62e |
| 4-5 | 4-5 |
| 4-43 | 4-43 |
| 5-1 | 5-1 |
| Figure 5-1 (page N/A) | Figure 5-1 (page N/A) |
| Figure 5-2 (page N/A) | Figure 5-2 (page N/A) |
| Figure 5-3 (page N/A) | Figure 5-3 (page N/A) |

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 278 are hereby incorporated in the license. The Exelon Generation Company shall operate the facility in accordance with the Technical Specifications.

(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 plans[1], 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.

(4) Fire Protection

Exelon Generation Company shall implement and maintain in effect all provisions of the Fire Protection Program as described in the Updated FSAR for TMI-1.

Changes may be made to the Fire Protection Program without prior approval by the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. Temporary changes to specific fire protection features which may be necessary to accomplish maintenance or modifications are acceptable provided that interim compensate measures are implemented.

(5) The licensee shall implement a secondary water chemistry monitoring program to inhibit steam generator tube degradation. This program shall include:

a. Identification of a sampling schedule for the critical parameters and control points for these parameters;
b. Identification of the procedures used to measure the values of the critical parameters;
c. Identification of process sampling points;
d. Procedure for the recording and management of data;

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

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## 1. DEFINITIONS

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

### 1.1 RATED POWER

Rated power is a steady state reactor core output of 2568 MWt.

### 1.2 REACTOR OPERATING CONDITIONS

#### 1.2.1 COLD SHUTDOWN

The reactor is in the cold shutdown condition when it is subcritical by at least one percent delta k/k and $T_{ave}$ is no more than 200°F. Pressure is defined by Specification 3.1.2.

#### 1.2.2 HOT SHUTDOWN

The reactor is in the hot shutdown condition when it is subcritical by at least one percent delta k/k and $T_{ave}$ is at or greater than 525°F.

#### 1.2.3 REACTOR CRITICAL

The reactor is critical when the neutron chain reaction is self-sustaining and Keff = 1.0.

#### 1.2.4 HOT STANDBY

The reactor is in the hot standby condition when all of the following conditions exist:

a. $T_{ave}$ is greater than 525°F

b. The reactor is critical

c. Indicated neutron power on the power range channels is less than two percent of rated power

#### 1.2.5 POWER OPERATION

The reactor is in a power operating condition when the indicated neutron power is above two percent of rated power as indicated on the power range channels.

#### 1.2.6 REFUELING SHUTDOWN

The reactor is in the refueling shutdown condition when, even with all rods removed, the reactor would be subcritical by at least one percent delta k/k and the coolant temperature at the decay heat removal pump suction is no more than 140°F. Pressure is defined by Specification 3.1.2. A refueling shutdown refers to a shutdown to replace or rearrange all or a portion of the fuel assemblies and/or control rods.

### 1.4.2 REACTOR PROTECTION SYSTEM

The reactor protection system is described in Section 7.1 of the Updated FSAR. It is that combination of protection channels and associated circuitry which forms the automatic system that protects the reactor by control rod trip. It includes the four protection channels, their associated instrument channel inputs, manual trip switch, all rod drive control protection trip breakers, and activating relays or coils.

### 1.4.3 PROTECTION CHANNEL

A PROTECTION CHANNEL as described in Section 7.1 of the updated FSAR (one of three or one of four independent channels, complete with sensors, sensor power supply units, amplifiers, and bistable modules provided for every reactor protection safety parameter) is a combination of instrument channels forming a single digital output to the protection system's coincidence logic. It includes a shutdown bypass circuit, a protection channel bypass circuit and a reactor trip module.

### 1.4.4 REACTOR PROTECTION SYSTEM LOGIC

This system utilizes reactor trip module relays (coils and contacts) in all four of the protection channels as described in Section 7.1 of the updated FSAR, to provide reactor trip signals for de-energizing the four control rod drive trip breakers. The control rod drive trip breakers are arranged to provide a one-out-of-two-times-two logic. Each element of the one-out-of-two-times-two logic is controlled by a separate set of two-out-of-four logic contacts from the four reactor protection channels.

### 1.4.5 ENGINEERED SAFETY FEATURES SYSTEM

This system utilizes relay contact output from individual channels arranged in three analog sub-systems and two two-out-of-three logic sub-systems as shown in Figure 7.1-4 of the updated FSAR. The logic sub-system is wired to provide appropriate signals for the actuation of redundant engineered safety features equipment on a two-of-three basis for any given parameter.

### 1.4.6 DEGREE OF REDUNDANCY

The difference between the number of operable channels and the number of channels which, when tripped, will cause an automatic system trip.

## 1.5 <u>INSTRUMENTATION SURVEILLANCE</u>

### 1.5.1 TRIP TEST

A TRIP TEST is a test of logic elements in a protection channel to verify their associated trip action.

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3.1 REACTOR COOLANT SYSTEM

3.1.1 OPERATIONAL COMPONENTS

Applicability

Applies to the operating status of reactor coolant system components.

Objective

To specify those limiting conditions for operation of reactor coolant system components which must be met to ensure safe reactor operations.

Specification

3.1.1.1 Reactor Coolant Pumps

a. Pump combinations permissible for given power levels shall be as shown in Specification Table 2.3.1.

b. Power operation with one idle reactor coolant pump in each loop shall be restricted to 24 hours. If the reactor is not returned to an acceptable RC pump operating combination at the end of the 24-hour period, the reactor shall be in a hot shutdown condition within the next 12 hours.

c. The boron concentration in the reactor coolant system shall not be reduced unless at least one reactor coolant pump or one decay heat removal pump is circulating reactor coolant.

3.1.1.2 Steam Generator (SG) Tube Integrity

a. Whenever the reactor coolant average temperature is above 200°F, the following conditions are required:

(1.) SG tube integrity shall be maintained.

AND

(2.) All SG tubes satisfying the tube repair criteria shall be plugged in accordance with the Steam Generator Program. (The Steam Generator Program is described in Section 6.19.)

ACTIONS:

---------------------------------------------NOTE---------------------------------------------

Entry into Sections 3.1.1.2.a.(3.) and (4.), below, is allowed for each SG tube.

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(3.) If the requirements of Section 3.1.1.2.a.(2.) are not met for one or more tubes then perform the following:

## 3.1.2 PRESSURIZATION HEATUP AND COOLDOWN LIMITATIONS

Applicability

Applies to pressurization, heatup and cooldown of the reactor coolant system.

Objectives

To assure that temperature and pressure changes in the reactor coolant system do not cause cyclic loads in excess of design for reactor coolant system components.

To assure that reactor vessel integrity by maintaining the stress intensity as a result of operational plant heatup and cooldown conditions and inservice leak and hydro test conditions below values which may result in non-ductile failure.

Specification

3.1.2.1 For operations until 29 effective full power years, the reactor coolant pressure and the system heatup and cooldown rates (with the exception of the pressurizer) shall be limited in accordance with Figure 3.1-1 and Figure 3.1-2 and are as follows:

Heatup/Cooldown

Allowable combinations of pressure and temperature shall be to the right of and below the limit line in Figure 3.1-1. Heatup and cooldown rates shall not exceed those shown on Figure 3.1-1.

Inservice Leak and Hydrostatic Testing

Allowable combinations of pressure and temperature shall be to the right of and below the limit line in Figure 3.1-2. Heatup and cooldown rates shall not exceed those shown on Figure 3.1-2.

3.1.2.2 The secondary side of the steam generator shall not be pressurized above 200 psig if the temperature of the steam generator shell is below 100°F.

3.1.2.3 The pressurizer heatup and cooldown rates shall not exceed 100°F in any one hour. The spray shall not be used if the temperature difference between the pressurizer and the spray fluid is greater than 430°F.

3.1.2.4 Prior to exceeding 29 effective full power years of operation, Figures 3.1-1 and 3.1-2 shall be updated for the next service period in accordance with 10 CFR 50, Appendix G. The highest predicted adjusted reference temperature of all the beltline materials shall be used to determine the adjusted reference temperature at the end of the service period. The basis for this prediction shall be submitted for NRC staff review in accordance with Specification 3.1.2.5.

3.1.2.5 The updated proposed technical specifications referred to in 3.1.2.4 shall be submitted for NRC review at least 90 days prior to the end of the service period. Appropriate additional NRC review time shall be allowed for proposed technical specification submitted in accordance with 10 CFR 50, Appendix G.

3.1.3 MINIMUM CONDITIONS FOR CRITICALITY

Applicability

Applies to reactor coolant system conditions required prior to criticality.

Objective

a. To limit the magnitude of any power excursions resulting from reactivity insertion due to moderator pressure and moderator temperature coefficients.

b. To assure that the reactor coolant system will not go solid in the event of a rod withdrawal or startup accident.

c. To assure sufficient pressurizer heater capacity to maintain natural circulation conditions during a loss of offsite power.

Specification

3.1.3.1 The reactor coolant temperature shall be above 525°F except for portions of low power physics testing when the requirements of Specification 3.1.9 shall apply.

3.1.3.2 Reactor coolant temperature shall be above DTT +10°F.

3.1.3.3 When the reactor coolant temperature is below the minimum temperature specified in 3.1.3.1 above, except for portions of low power physics testing when the requirements of Specification 3.1.9 shall apply, the reactor shall be subcritical by an amount equal to or greater than the calculated reactivity insertion due to depressurization.

3.1.3.4 Pressurizer

3.1.3.4.1 The reactor shall be maintained subcritical by at least one percent delta k/k until a steam bubble is formed and an indicated water level between 80 and 385 inches is established in the pressurizer.

(a) With the pressurizer level outside the required band, be in at least HOT SHUTDOWN with the reactor trip breakers open within 6 hours and be in COLD SHUTDOWN within an additional 30 hours.

3.1.3.4.2 A minimum of 107 kw of pressurizer heaters, from each of two pressurizer heater groups shall be OPERABLE. Each OPERABLE 107 kw of pressurizer heaters shall be capable of receiving power from a 480 volt ES bus via the established manual transfer scheme.

## 3.1.9 LOW POWER PHYSICS TESTING RESTRICTIONS

### Applicability

Applies to Reactor Protection System requirements for low power physics testing.

### Objective

To assure an additional margin of safety during low power physics testing.

### Specification

The following special limitations are placed on low power physics testing.

3.1.9.1 Reactor Protection System Requirements

a. Below 1720 psig Shutdown Bypass trip setting limits shall apply in accordance with Table 2.3-1.

b. Above 1800 psig nuclear overpower trip shall be set at less than 5.0 percent. Other settings shall be in accordance with Table 2.3-1.

3.1.9.2 Startup Rate Rod Withdrawal Hold (Reference 1) Shall be operable At All Times.

3.1.9.3 Shutdown margin may not be reduced below 1% delta k/k per 3.5.2.1.

### Bases

The above specification provides additional safety margins during low power physics testing, as is also provided for startup (Reference 2.)

### REFERENCES

(1) UFSAR, Section 7.2.2.1.b - "Reactivity Rate Limits"

(2) UFSAR, Section 14.1.2.2 - "Startup Accident"

## 3.1.13 REACTOR COOLANT SYSTEM VENTS

### Applicability

Provides the limiting conditions for operation of the Reactor Coolant System Vents. These limiting conditions for operation (LCO) are applicable only when Reactor is critical.

### Objective

To ensure that sufficient vent flow paths are operable during the plant operating modes mentioned above.

### Specification

3.1.13.1 At least one reactor coolant system vent path consisting of at least two power operated valves in series, powered from emergency buses shall be OPERABLE and closed at each of the following locations:

a. Reactor vessel head (RC-V42 & RC-V43)
b Pressurizer steam space (RC-V28 & RC-V44)
c. Reactor coolant system high point (either RC-V40A and 41A) or (RC-40B and 41B)

### Action

3.1.13.2 a. With one of the above reactor coolant system vent paths inoperable, the inoperable vent path shall be maintained closed, with power removed from the valve actuators in the inoperable vent path. The inoperable vent path shall be restored to OPERABLE status within 30 days, or the plant shall be in OT SHUTDOWN within an additional 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With two or more of the above reactor coolant system vent paths inoperable, maintain the inoperable vent path closed, with power removed from the valve actuators in the inoperable vent paths, and restore at least two of the vent paths to OPERABLE status within 72 hours or be in HOT SHUTDOWN within an additional 6 hours and in COLD SHUTDOWN within the following 30 hours.

## 3.3 EMERGENCY CORE COOLING, REACTOR BUILDING EMERGENCY COOLING AND REACTOR BUILDING SPRAY SYSTEMS

Applicability

Applies to the operating status of the emergency core cooling, reactor building emergency cooling, and reactor building spray systems.

Objective

To define the conditions necessary to assure immediate availability of the emergency core cooling, reactor building emergency cooling and reactor building spray systems.

Specification

3.3.1 The reactor shall not be made critical unless the following conditions are met:

3.3.1.1 Injection Systems

a. The borated water storage tank (BWST) shall contain a minimum of 350,000 gallons of water having a minimum concentration of 2,500 ppm boron at a temperature not less than 40°F. If the boron concentration or water temperature is not within limits, restore the BWST to OPERABLE within 8 hrs. If the BWST volume is not within limits, restore the BWST to OPERABLE within one hour. Specification 3.0.1 applies.

b. Two Makeup and Purification (MU)/High Pressure Injection (HPI) pumps are OPERABLE in the engineered safeguards mode powered from independent essential buses. Specification 3.0.1 applies.

c. Two decay heat removal pumps are OPERABLE. Specification 3.0.1 applies.

d. Two decay heat removal coolers and their cooling water supplies are OPERABLE. (See Specification 3.3.1.4) Specification 3.0.1 applies.

e. Two BWST level instrument channels are OPERABLE.

f. The two reactor building sump isolation valves (DH-V-6A/B) shall be remote-manually OPERABLE. Specification 3.0.1 applies.

g. MU Tank (MUT) pressure and level shall be maintained within the Unrestricted Operating Region of Figure 3.3-1.

   1) With MUT conditions outside of the Unrestricted Operating Region of Figure 3.3-1, restore MUT pressure and level to within the Unrestricted Operating Region within 72 hrs. Specification 3.0.1 applies.

   2) Operation with MUT conditions within the Prohibited Region of Figure 3.3-1 is prohibited. Specification 3.0.1 applies.

3.3.1.2 Core Flooding System

a. Two core flooding tanks (CFTs) each containing 940 ± 30 $ft^3$ of borated water at 600 ± 25 psig shall be available. Specification 3.0.1 applies.

b. CFT boron concentration shall not be less than 2,270 ppm boron. Specification 3.3.2.1 applies.

c. The electrically operated discharge valves from the CFT will be assured open by administrative control and position indication lamps on the engineered safeguards status panel. Respective breakers for these valves shall be open and conspicuously marked. A one hour time clock is provided to open the valve and remove power to the valve. Specification 3.0.1 applies.

d. DELETED

e. CFT vent valves CF-V-3A and CF-V-3B shall be closed and the breakers to the CFT vent valve motor operators shall be tagged open, except when adjusting core flood tank level and/or pressure. Specification 3.0.1 applies.

3.3.1.3 Reactor Building Spray System and Reactor Building Emergency Cooling System

The following components must be OPERABLE:

a. Two reactor building spray pumps and their associated spray nozzles headers and two reactor building emergency cooling fans and associated cooling units (one in each train). Specification 3.0.1 applies.

b. The Reactor Building emergency sump pH control system shall be maintained with ≥ 18,815 lbs and ≤ 28,840 lbs of trisodium phosphate dodecahydrate (TSP). Specification 3.3.2.1 applies.

3.3.1.4 Cooling Water Systems - Specification 3.0.1 applies.

a. Two nuclear service closed cycle cooling water pumps must be OPERABLE.

b. Two nuclear service river water pumps must be OPERABLE.

c. Two decay heat closed cycle cooling water pumps must be OPERABLE.

d. Two decay heat river water pumps must be OPERABLE.

e. Two reactor building emergency cooling river water pumps must be OPERABLE.

3.3.1.5 Engineered Safeguards Valves and Interlocks Associated with the Systems in Specifications 3.3.1.1, 3.3.1.2, 3.3.1.3, 3.3.1.4 are OPERABLE. Specification 3.0.1 applies.

## 3.3 EMERGENCY CORE COOLING, REACTOR BUILDING EMERGENCY COOLING AND REACTOR BUILDING SPRAY SYSTEMS (Contd.)

3.3.2 Maintenance or testing shall be allowed during reactor operation on any component(s) in the makeup and purification, decay heat, RB emergency cooling water, RB spray, BWST level instrumentation, or cooling water systems which will not remove more than one train of each system from service. Components shall not be removed from service so that the affected system train is inoperable for more than 72 consecutive hours. If the system is not restored to meet the requirements of Specification 3.3.1 within 72 hours, the reactor shall be placed in a HOT SHUTDOWN condition within six hours.

3.3.2.1 If the CFT boron concentration is outside of limits, or if the TSP baskets contain amounts of TSP outside the limits specified in 3.3.1.3.b, restore the system to operable status within 72 hours. If the system is not restored to meet the requirements of Specification 3.3.1 within 72 hours, the reactor shall be placed in a HOT SHUTDOWN condition within six hours.

3.3.3 Exceptions to 3.3.2 shall be as follows:

a. Both CFTs shall be OPERABLE at all times.

b. Both the motor operated valves associated with the CFTs shall be fully open at all times.

c. One reactor building cooling fan and associated cooling unit shall be permitted to be out-of-service for seven days.

3.3.4 Prior to initiating maintenance on any of the components, the duplicate (redundant) component shall be verified to be OPERABLE.

### Bases

The requirements of Specification 3.3.1 assure that, before the reactor can be made critical, adequate engineered safety features are operable. Two engineered safeguards makeup pumps, two decay heat removal pumps and two decay heat removal coolers (along with their respective cooling water systems components) are specified. However, only one of each is necessary to supply emergency coolant to the reactor in the event of a loss-of-coolant accident. Both CFTs are required because a single CFT has insufficient inventory to reflood the core for hot and cold line breaks (Reference 1).

The operability of the borated water storage tank (BWST) as part of the ECCS ensures that a sufficient supply of borated water is available for injection by the ECCS in the event of a LOCA (Reference 2). The limits on BWST minimum volume and boron concentration ensure that 1) sufficient water is available within containment to permit recirculation cooling flow to the core, and 2) the reactor will remain at least one percent subcritical following a Loss-of-Coolant Accident (LOCA).

The contained water volume limit of 350,000 gallons includes an allowance for water not usable because of tank discharge location and sump recirculation switchover setpoint. Redundant heaters maintain the borated water supply at a temperature greater than 40°F.

The Reactor Building emergency sump pH control system ensures a sump pH between 7.3 and 8.0 during the recirculation phase of a postulated LOCA. A minimum pH level of 7.3 is required to reduce the potential for chloride induced stress corrosion cracking of austenitic stainless steel and assure the retention of elemental iodine in the recirculating fluid. A maximum pH value of 8.0 minimizes the

## 3.5.2 CONTROL ROD GROUP AND POWER DISTRIBUTION LIMITS

Applicability

This specification applies to power distribution and operation of control rods during power operation.

Objective

To assure an acceptable core power distribution during power operation, to set a limit on potential reactivity insertion from a hypothetical control rod ejection, and to assure core subcriticality after a reactor trip.

Specification

3.5.2.1 The available shutdown margin shall not be less than one percent delta K/K with the highest worth control rod fully withdrawn.

3.5.2.2 Operation with inoperable rods:

a. Operation with more than one inoperable rod as defined in Specification 4.7.1 in the safety or regulating rod banks shall not be permitted. Verify SDM ≥ 1% delta k/k or initiate boration to restore within limits within 1 hour. The reactor shall be brought to HOT SHUTDOWN within 6 hours.

b. If a control rod in the regulating and/or safety rod banks is declared inoperable in the withdrawn position as defined in Specification Paragraph 4.7.1.1 and 4.7.1.3, an evaluation shall be initiated immediately to verify the existence of one percent delta k/k hot shutdown margin. Boration may be initiated to increase the available rod worth either to compensate for the worth of the inoperable rod or until the regulating banks are fully withdrawn, whichever occurs first. Simultaneously a program of exercising the remaining regulating and safety rods shall be initiated to verify operability.

c. If within one hour of determination of an inoperable rod as defined in Specification 4.7.1, and once per 12 hours thereafter, it is not determined that a one percent delta k/k hot shutdown margin exists combining the worth of the inoperable rod with each of the other rods, the reactor shall be brought to the HOT SHUTDOWN condition within 6 hours until this margin is established.

d. Following the determination of an inoperable rod as defined in Specification 4.7.1, all rods shall be exercised within 24 hours and exercised weekly until the rod problem is solved.

e. If a control rod in the regulating or safety rod groups is declared inoperable per 4.7.1.2, and cannot be aligned per 3.5.2.2.f, power shall be reduced to ≤ 60% of the thermal power allowable for the reactor coolant pump combination within 2 hours, and the overpower trip setpoint shall be reduced to ≤ 70% of the thermal power allowable within 10 hours. Verify the potential ejected rod worth (ERW) is within the assumptions of the ERW analysis and verify peaking factor ($F_Q(Z)$ and $F_{\Delta H}^{N}$) limits per the COLR have not been exceeded within 72 hours.

3.5.2.5 Control Rod Positions

a. Operating rod group overlap shall not exceed 25 percent ±5 percent, between two sequential groups except for physics tests.

b. Position limits are specified for regulating control rods. Except for physics tests or exercising control rods, the regulating control rod insertion/withdrawal limits are specified in the CORE OPERATING LIMITS REPORT.

1. If regulating rods are inserted in the restricted operating region, corrective measures shall be taken immediately to achieve an acceptable control rod position. Acceptable control rod positions shall be attained within 24 hours, and FQ(Z) and $F_{\Delta H}^{N}$ shall be verified within limits once every 2 hours, or power shall be reduced to ≤ power allowed by insertion limits.

2. If regulating rods are inserted in the unacceptable operating region, initiate boration within 15 minutes to restore SDM to ≥1% delta K/K, and restore regulating rods to within restricted region within 2 hours or reduce power to ≤ power allowed by rod insertion limits.

c. Safety rod limits are given in 3.1.3.5.

3.5.2.6 Deleted

3.5.2.7 Axial Power Imbalance:

a. Except for physics tests the axial power imbalance, as determined using the full incore system (FIS), shall not exceed the envelope defined in the CORE OPERATING LIMITS REPORT.

The FIS is operable for monitoring axial power imbalance provided the number of valid self powered neutron detector (SPND) signals in any one quadrant is not less than the limit in the CORE OPERATING LIMITS REPORT.

b. When the full incore detector system is not OPERABLE and except for physics tests axial power imbalance, as determined using the power range channels (out of core detector system)(OCD), shall not exceed the envelope defined in the CORE OPERATING LIMITS REPORT.

c. When neither detector system above is OPERABLE and, except for physics tests axial power imbalance, as determined using the minimum incore system (MIS), shall not exceed the envelope defined in the CORE OPERATING LIMITS REPORT.

d. Except for physics tests if axial power imbalance exceeds the envelope, corrective measures (reduction of imbalance by control rod movements and/or reduction in reactor power) shall be taken to maintain operation within the envelope. Verify FQ(Z) and $F_{\Delta H}^{N}$ are within limits of the COLR once per 2 hours when not within imbalance limits.

INFORMATION ON THIS PAGE HAS BEEN DELETED

## 3.6 REACTOR BUILDING

Applicability

Applies to the CONTAINMENT INTEGRITY of the reactor building as specified below.

Objective

To assure CONTAINMENT INTEGRITY.

Specification

3.6.1 Except as provided in Specifications 3.6.6, 3.6.8, and 3.6.12, CONTAINMENT INTEGRITY (Section 1.7) shall be maintained whenever all three of the following conditions exist:

a. Reactor coolant pressure is 300 psig or greater.

b. Reactor coolant temperature is 200 degrees F or greater.

c. Nuclear fuel is in the core.

3.6.2 Except as provided in Specifications 3.6.6, 3.6.8, and 3.6.12, CONTAINMENT INTEGRITY shall be maintained when both the reactor coolant system is open to the containment atmosphere and a shutdown margin exists that is less than that for a refueling shutdown.

3.6.3 Positive reactivity insertions which would result in a reduction in shutdown margin to less than 1% delta k/k shall not be made by control rod motion or boron dilution unless CONTAINMENT INTEGRITY is being maintained.

3.6.4 The reactor shall not be critical when the reactor building internal pressure exceeds 2.0 psig or 1.0 psi vacuum.

3.6.5 Prior to criticality following refueling shutdown, a check shall be made to confirm that all manual Containment Isolation Valves (CIVs) which should be closed are closed and are conspicuously marked.

3.6.6 When CONTAINMENT INTEGRITY is required, if a CIV (other than a purge valve) is determined to be inoperable:

a. For lines isolable by two or more CIVs, the CIV(s)* required to isolate the penetration shall be verified to be OPERABLE. If the inoperable valve is not restored within 48 hours, at least one CIV* in the line will be closed or the reactor shall be brought to HOT SHUTDOWN within the next 6 hours and to the COLD SHUTDOWN condition within an additional 30 hours.

b. For lines isolable by one CIV, where the other barrier is a closed system, the line shall be isolated by at least one closed and de-activated automatic valve, closed manual valve, or blind flange within 72 hours or the reactor shall be brought to HOT SHUTDOWN within the next 6 hours and to the COLD SHUTDOWN condition within an additional 30 hours.

* All CIVs required to isolate the penetration.

c. Both diesel generators shall be operable except that from the date that one of the diesel generators is made or found to be inoperable for any reason, reactor operation is permissible for the succeeding seven days provided that the redundant diesel generator is:

1. verified to be operable immediately;

2. within 24 hours, either:

    a. determine the redundant diesel generator is not inoperable due to a common mode failure; or,

    b. test redundant diesel generator in accordance with surveillance requirement 4.6.1.a.

In the event two diesel generators are inoperable, the unit shall be placed in HOT SHUTDOWN in 12 hours. If one diesel is not operable within an additional 24 hour period the plant shall be placed in COLD SHUTDOWN within an additional 24 hours thereafter.

With one diesel generator inoperable, in addition to the above, verify that: All required systems, subsystems, trains, components and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE or follow specifications 3.0.1.

d. If one Unit Auxiliary Transformer is inoperable and a diesel generator becomes inoperable, the unit will be placed in HOT SHUTDOWN within 12 hours. If one of the above sources of power is not made operable within an additional 24 hours the unit shall be placed in COLD SHUTDOWN within an additional 24 hours thereafter.

e. If Unit 1 is separated from the system while carrying its own auxiliaries, or if only one 230 kV line is in service, continued reactor operation is permissible provided one emergency diesel generator shall be started and run continuously until two transmission lines are restored.

f. The engineered safeguards electrical bus, switchgear, load shedding, and automatic diesel start systems shall be operable except as provided in Specification 3.7.2c above and as required for testing.

g. One station battery may be removed from service for not more than eight hours.

h. If it is determined that a trip of the Unit 1 generator, in conjunction with LOCA loading, will result in a loss of offsite power to Engineered Safeguards buses, the plant shall begin a power reduction within 24 hours and be in HOT SHUTDOWN in an additional 6 hours, except as provided in Specification 3.7.2.e above.

3.15.4 Fuel Handling Building ESF Air Treatment System

Applicability

Applies to the Fuel Handling Building (FHB) ESF Air Treatment System and its associated filters.

Objective

To specify minimum availability and efficiency for the FHB ESF Air Treatment System and its associated filters for irradiated fuel handling operations.

Specifications

3.15.4.1 Prior to fuel movement each refueling outage, two trains shall be operable. One train shall be operating continuously whenever TMI-1 irradiated fuel handling operations in the FHB are in progress.

a. With one train inoperable, irradiated fuel handling operations in the Fuel Handling Building may continue provided the redundant train is operating.

b. With both trains inoperable, handling of irradiated fuel in the Fuel Handling Building shall be suspended until such time that at least one train is operable and operating. Any fuel assembly movement in progress may be completed.

3.15.4.2 A FHB ESF Air Treatment System train is operable when its surveillance requirements are met and:

a. The results of the in-place DOP and halogenated hydrocarbon tests at design flows on HEPA filters and carbon absorber banks shall show $< 0.05\%$ DOP penetration and $< 0.05\%$ halogenated hydrocarbon penetration.

b. The results of laboratory carbon sample analysis shall show $\geq 95\%$ radioactive methyl iodide decontamination efficiency when tested in accordance with ASTM D3803-1989 at 30°C, 95% R.H.

c. The fans AH-E-137A and B shall each be shown to operate within ± 10% of design flow (6,000 SCFM).

Bases

Compliance with these specifications satisfies the condition of operation imposed by the Licensing Board as described in NRC's letter dated October 2, 1985, item 1.c.

The FHB ESF Air Treatment System contains, controls, mitigates, monitors and records radiation release resulting from a TMI-1 postulated spent fuel accident in the Fuel Handling Building as described in the FSAR. Offsite doses will be less than the 10 CFR 100 guidelines for accidents analyzed in Chapter 14 (Reference 1).

TABLE 4.1-1 (Continued)

| CHANNEL DESCRIPTION | CHECK(c) | TEST(c) | CALIBRATE(c) | REMARKS |
|---|---|---|---|---|
| 19. Reactor Building Emergency Cooling and Isolation System Analog Channels | | | | |
| a. Reactor Building 4 psig Channels | (1) | (1) | | (1) When CONTAINMENT INTEGRITY is required. |
| b. RCS Pressure 1600 psig | (1) | (1) | NA | (1) When RCS Pressure > 1800 psig. |
| c. Deleted | | | | |
| d. Reactor Bldg. 30 psi pressure switches | (1) | (1) | | (1) When CONTAINMENT INTEGRITY is required. |
| e. Reactor Bldg. Purge Line High Radiation (AH-V-1A/D) | (1) | (1) | | (1) When CONTAINMENT INTEGRITY is required. |
| f. Line Break Isolation Signal (ICCW & NSCCW) | (1) | (1) | | (1) When CONTAINMENT INTEGRITY is required. |
| 20. Reactor Building Spray System Logic Channel | NA | | NA | |
| 21. Reactor Building Spray 30 psig pressure switches | NA | | | |
| 22. Pressurizer Temperature Channels | | NA | | |
| 23. Control Rod Absolute Position | (1) | NA | | (1) Check with Relative Position Indication |
| a. Zone Reference Switch | NA | R(1) | NA | (1) Verify switch functions |
| 24. Control Rod Relative Position | (1) | NA | NA | (1) Check with Absolute Position Indication |
| 25. Core Flooding Tanks | | | | |
| a. Pressure Channels | NA | NA | | |
| b. Level Channels | NA | NA | | |
| 26. Pressurizer Level Channels | | NA | | |

## 4.5.3 REACTOR BUILDING COOLING AND ISOLATION SYSTEM

Applicability

Applies to testig of the reactor building cooling and isolation systems.

Objective

To verify that the reactor building cooling systems are operable.

Specification

4.5.3.1 System Tests

a. Reactor Building Spray System

1. At the frequency specified in the Surveillance Frequency Control Program and simultaneously with the test of the emergency loading sequence, a Reactor Building 30 psi high pressure test signal will start the spray pump. Except for the spray pump suction valves, all engineered safeguards spray valves will be closed.

   Water will be circulated from the borated water storage tank through the reactor building spray pumps and returned through the test line to the borated water storage tank.

   The operation of the spray valves will be verified during the component test of the R. B. Cooling and Isolation System.

   The test will be considered satisfactory if the spray pumps have been successfully started.

2. Compressed air will be introduced into the spray headers to verify each spray nozzle is unobstructed at the frequency specified in the Surveillance Frequency Control Program.

b. Reactor Building Cooling and Isolation Systems

1. At the frequency specified in the Surveillance Frequency Control Program, a system test shall be conducted to demonstrate proper operation of the system.

2. The test will be considered satisfactory if measured system flow is greater than accident design flow rate.

5.0 DESIGN FEATURES

5.1 SITE

Applicability

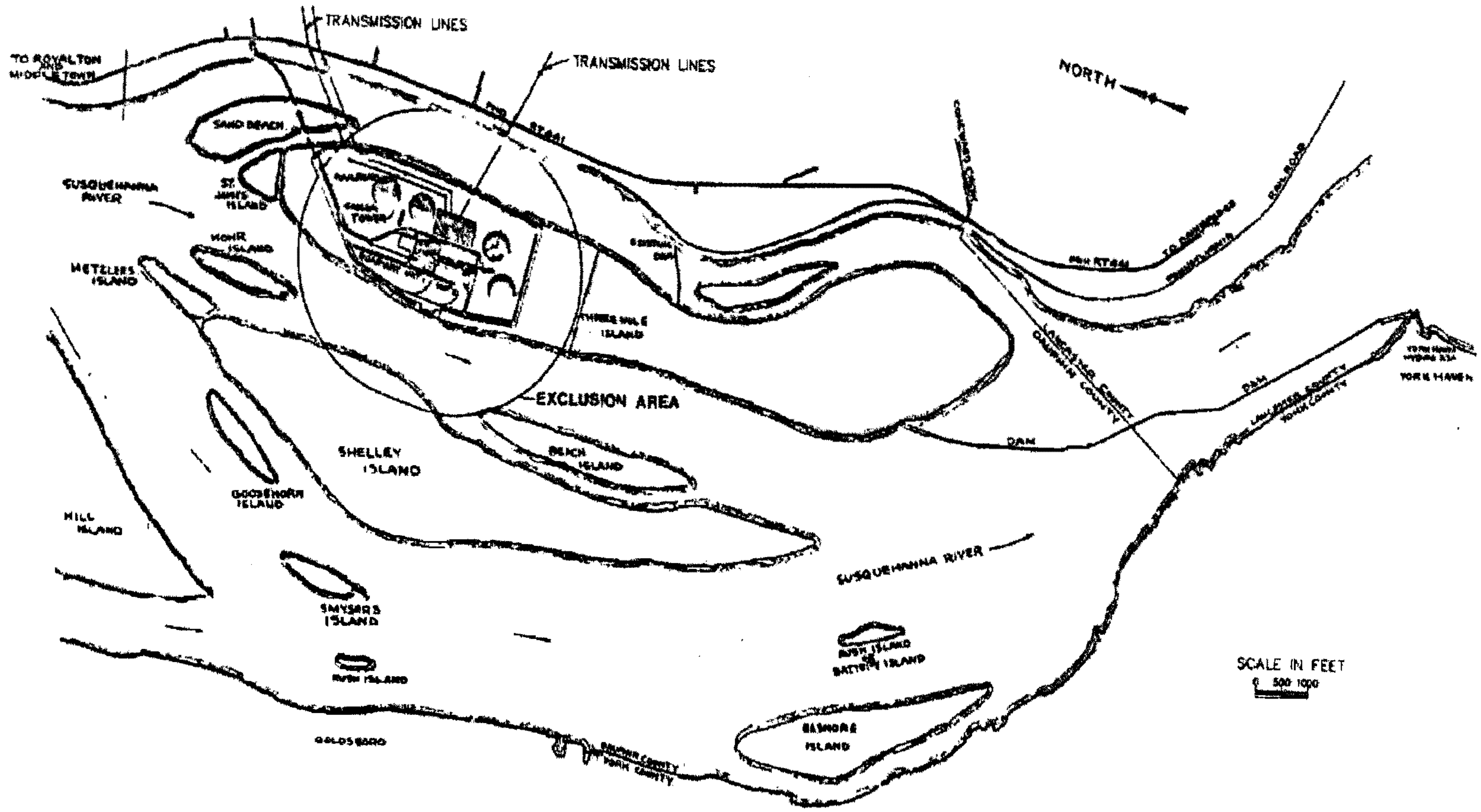
Applies to the location and extent of the exclusion boundary, restricted area, and low population zone.

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 coterminal 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 Exclusion Area as defined in 10 CFR 100.3, is a 2,000 ft. radius, including portions of Three Mile Island, the river surface around it, and a portion of Shelley Island, which is owned by Exelon Generation Company, LLC. The minimum distance of 2,000 ft. occurs on the shore of the mainland in a due easterly direction from the plant as shown on Figure 5-1 for the Exclusion Area. Figure 5-3 showing the physical location of the fence defines the "Restricted Area" surrounding the plant. The minimum distance of the "Restricted Area" is approximately 560 feet and is from the centerline of the TMI Unit 2 Reactor Building to a point on the westerly shoreline of Three Mile Island. The minimum distance to the outer boundary of the low population zone is two miles as shown on T.S. Figure 5-2, which also depicts the site topography for a radius of five miles. T.S. Figure 5-3 depicts the locations of gaseous effluent release points and liquid effluent outfalls (as tabularized on page 5-10), and the meteorological tower location (designated as 'weather tower' on the figure).

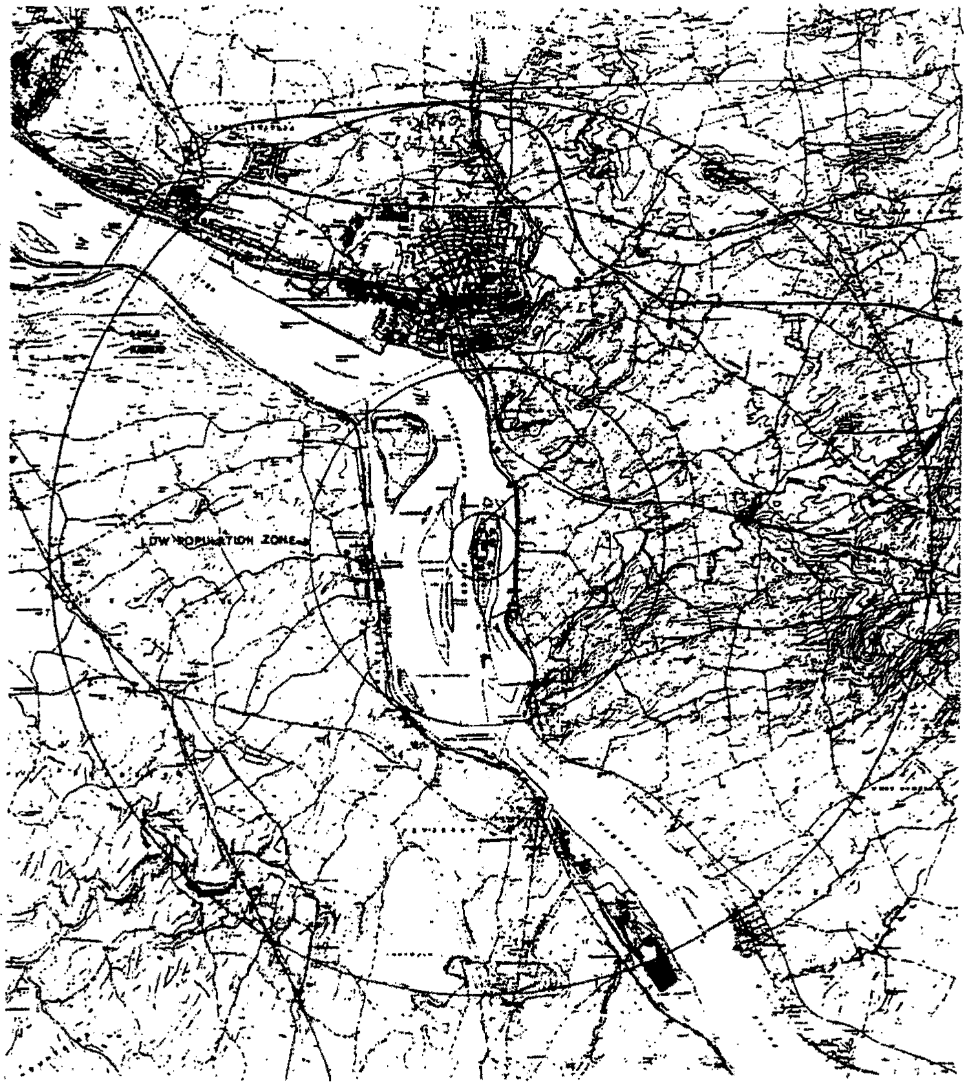



Amendment No. ~~140, 216, 246~~ 278

**Exelon**
Three Mile Island Nuclear Station

EXTENDED PLOT PLAN

CAD FILE: 6717R1,DWG FIG 5-1



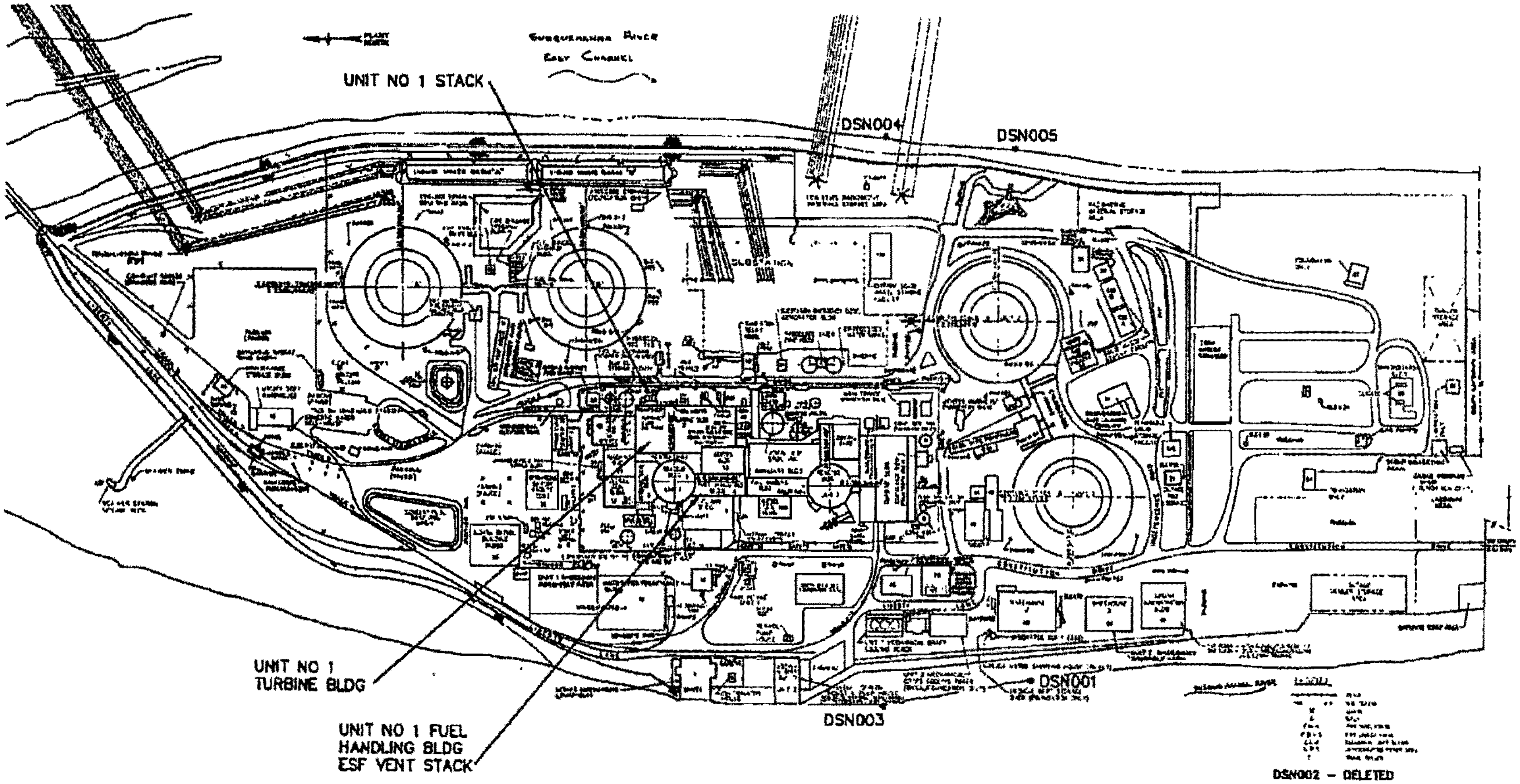

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

Exelon

**Site Topography**
**5 Mile Radius**

**Three Mile Island Nuclear Station**

**Fig. 5-2**




**Exelon**
Three Mile Island Nuclear Station

Gaseous Effluent Release Point and Liquid Effluent Outlet Locations

FIG 5-3

**UNITED STATES**
**NUCLEAR REGULATORY COMMISSION**
**WASHINGTON, D.C. 20555-0001**

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 278 TO FACILITY OPERATING LICENSE NO. DPR-50

ADMINISTRATIVE TECHNICAL SPECIFICATION CHANGES

EXELON GENERATION COMPANY, LLC

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

DOCKET NO. 50-289

## 1.0 INTRODUCTION

By application dated October 18, 2011[1], as supplemented by additional letters[2], Exelon Generation Company (Exelon, or the licensee) requested changes to the Technical Specifications (TSs) for Three Mile Island Nuclear Station, Unit 1 (TMI-1). The supplement provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards determination as published in the *Federal Register* on December 13, 2011 (76 FR 77567).

The amendment involves administrative changes. The changes include correcting typographical errors, making format changes, clarifying symbols and pages, reformatting of previously deleted pages, incorporating a consistent abbreviation of average reactor coolant temperature, deleting notes that are no longer applicable, and replacing certain drawing figures with versions that have a corrected title block.

## 2.0 REGULATORY EVALUATION

Section 182a of the Atomic Energy Act of 1954, as amended, requires all applicants for nuclear power plant licenses to include TSs as part of the license. Included in the criteria that the TS must cover are: (1) the specific characteristics of the facility; and (2) other such information deemed by the Commission necessary to ensure that the utilization of special nuclear material will be in accord with the common defense and security, and will provide adequate protection to the health and safety of the public.

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36 specifies the categories and criteria for information that must be included in the TSs. These include the following: (1) safety limits, limiting safety system settings, and limiting control settings;

1. Agencywide Documents Access and Management System (ADAMS) Accession No. ML112911548.
2. January 20, 2012 (ADAMS Accession No. ML12020A091), and April 11, 2012 (ADAMS Accession No. ML12102A134).

Enclosure

(2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls. The TMI-1 TSs are structured such that they substantially conform to the 10 CFR 50.36(c) categories listed above.

## 3.0 TECHNICAL EVALUATION

In order to systematically evaluate the proposed changes, the NRC staff categorized the proposed license amendment request by the type of change. Each of these categories is discussed below.

### 3.1 Format Changes

The licensee proposed a number of changes that change the presentation of information in the TS and not the technical content. Specifically, these proposed changes are:

- Certain Table of Contents (TOC) TS section references remove the "all capitalization" format and replace it with the "initial capitalization" format consistent with similar sections of the TOC. These specific TOC references are: 1.9, 1.10, 1.11, 4.4.1, 4.4.2, 4.4.3, 4.4.4, 4.5.1, 4.5.2, 4.5.3, 4.5.4, 4.7.1, 4.8, 4.9.1, 4.9.2, 4.12.1, 4.12.4, 4.14, 5.2.1, 5.2.2, 5.3.1, 5.3.2, 5.4.1, 5.4.2, 6.2.1, 6.2.2, 6.5, 6.5.1, 6.5.2, 6.5.3, 6.5.4, 6.9.1, 6.9.2, 6.9.3, 6.9.4, 6.9.5, 6.9.6, 6.15, and 6.16. The NRC reviewed each of these changes and agrees with the licensee that there were no changes to the content of the text in these references, other than the capitalization changes.

- A number of TOC TS section references remove the "initial capitalization" format and replace it with the "all capitalization" format consistent with similar sections of the TOC. These specific TOC references are: 2.1, 2.2, 2.3, 3.0, 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.10, 3.11, 3.12, 3.13, 3.14, and 3.15. The NRC reviewed each of these changes and agrees with the licensee that there were no changes to the content of the text in these references, other than the capitalization changes.

- Certain TOC sections alter indentations and line breaks to be consistent with the following numbering format, as specified by the licensee:

  <Line Break>
  1. HEADING 1
  1.1 HEADING 2
  1.1.1 Heading 3

  The NRC reviewed each of these changes to the TOC and concludes that these changes only impact the presentation of the TOC information, not the content.

- The amendment revision section on the footer of page "i" adds strikethrough formatting, consistent with other TS pages. The NRC agrees with the licensee that there are no changes to the content of the text with this alteration.

- A line break is being added to the header of page "ii" to be consistent with similar sections of the TOC. The NRC reviewed this change and concludes that this change only impacts the presentation of the TOC information, not the content.

- TOC TS section references 3.2 and 3.9 on page "ii" are being revised to remove underlining consistent with similar sections of the TOC. The NRC agrees with the licensee that there were no changes to the content of the text.

- The "Table of Contents" header on page "iii" is being revised to add underlining, consistent with similar sections of the TOC. The NRC agrees with the licensee that there were no changes to the content of the text.

- A line break is being removed from the header of page "iii" to be consistent with similar sections of the TOC. The NRC reviewed this change and concludes that this change only impacts the presentation of the information, not the content.

- The amendment revision section on the footer of page "iii" is being revised to add the text "No." consistent with similar sections of the TOC. The NRC reviewed this proposed change and concludes that this change does not alter the intent of the information presented, and provides clarification to the numbers that follow. It is also consistent with the NRC's standard nomenclature used with the issuance of amendments.

- TOC TS numerical reference "6-20" on page "v" is being revised to "6.20" to match the formatting of the TOC, and the specification on page 6-29. The NRC reviewed this proposed change and concludes that it only impacts the presentation of the information, not the content.

- The page number on the footer of page v is being revised to remove the two hyphens (-) on either side of the page number consistent with similar sections of the TOC. The NRC reviewed this proposed change and concludes that it only impacts the presentation of the information, not the content.

- TS 1.4.2, 1.4.3, and 1.4.4 on page 1-3 is being edited to remove boldface formatting of the words "described in section 7.1." The NRC reviewed this proposed change and concludes that removing the boldface format results in no changes to the technical content of the text in these paragraphs.

- TS 3.1.1 header "OPERATIONAL COMPONENTS" on page 3-1a is being reformatted consistent with the general TMI-1 TS format to add underlining. The NRC reviewed this proposed change and concludes that removing the boldface format results in no changes to the technical content of the text.

- TS 3.1.2 header "PRESSURIZATION HEATUP AND COOLDOWN LIMITATIONS" on page 3-3 is being reformatted consistent with the general TMI-1 TS format to add underlining. The NRC reviewed this proposed change and concludes that it does not result in a change to the technical content of the text.

- TS 3.1.3 header "MINIMUM CONDITIONS FOR CRITICALITY" on page 3-6 is being reformatted consistent with the TMI-1 TS format to add underlining. The NRC reviewed this proposed change and concludes that it does not result in a change to the technical content of the text.

- TS 3.1.9 header "LOW POWER PHYSICS TESTING RESTRICTIONS" on page 3-18 is being reformatted consistent with the TMI-1 TS format to add underlining. The

NRC reviewed this proposed change and concludes that it does not result in a change to the technical content of the text.

- TS 3.1.13 header "REACTOR COOLANT SYSTEM VENTS" on page 3-18g is being reformatted consistent with the TMI-1 TS format to add underlining. The NRC reviewed this proposed change and concludes that that it does not result in a change to the technical content of the text.

- TS 3.3.1.1.a-g and 3.3.1.2.a on page 3-21 are being edited to remove boldface formatting. The NRC staff agrees with the licensee that there are no technical changes to the content of the text with this edit.

- TS 3.3.1.2.b, c, and e, as well as the header on page 3-22, are being edited to remove boldface formatting. The NRC staff agrees with the licensee that there are no changes to the technical content of the text with this edit.

- TS 3.15.4.2.b on page 3-62e is being edited to remove boldface formatting. The NRC staff agrees with the licensee that there are no changes to the technical content of the text with this edit.

As described above, for all of these changes, the NRC staff reviewed the licensee's proposal and concludes that the changes only impact the format and presentation of the TS. They involve no change to technical content, continue to comply with the provisions of 10 CFR 50.36, and are therefore, acceptable.

3.2 Changes Relating to Previously Deleted Information

The licensee submitted several proposed changes relating to establishing consistency regarding the manner in which deleted information is portrayed in the TS. These are described as follows.

- According to the licensee there are certain TOC TS section references that were previously deleted in the TMI-1 TS TOC via other license amendments. However, in the cases cited, the old title remained in the TS TOC with a notation that the section has been deleted. The licensee proposes to revise the TOC such that it only states the word "Deleted" instead of the having the old titles remain, consistent with other similar sections of the TOC (e.g., TS TOC 1.9, 1.10 and 1.11). This affects the following TS TOC items: 1.14, 3.1.10, 3.5.4, 3.15.2, 3.15.3, 3.18, 3.20, 3.21, 3.21.1, 3.21.2, 3.22, 3.22.1, 3.22.2, 3.22.3, 3.22.4, 3.23, 3.23.1, 3.23.2, 3.23.3, 4.3, 4.7.2, 4.12.2, 4.12.3, 4.18, 4.21, 4.21.1, 4.21.2, 4.22, 4.22.1, 4.22.2, 4.22.3, 4.22.4, 4.23.1, 4.23.2, and 4.23.3.

- According to the licensee, TS Figure 2.1-2 on page 2-4b was deleted per TMI-1 TS Amendment 184 (ADAMS Accession No. ML003766492); however, the page still exists in the TS with the word "DELETED" printed over the figure. Consistent with other figure deletions in TS (e.g., Figures 3.1-2a, 3.1-3, and 3.5-2a-l), page 2-4b is being proposed for replacement with a page containing only the words, "INFORMATION ON THIS PAGE HAS BEEN DELETED." The footer containing the page amendment history remains.

- Similarly, TS Figure 2.3-2 on page 2-12 was also deleted per Amendment 184; however, the page still exists in the TS with the word "DELETED" printed over the figure. Consistent with other figure deletions in TS, page 2-12 is being proposed for replacement with a page containing only the words, "INFORMATION ON THIS PAGE HAS BEEN DELETED." The footer containing the page amendment history remains.

- TS Figure 3.5-2M on page 3-36b was deleted in accordance with TMI-1 TS Amendment 168, dated February 11, 1993 (ADAMS Accession No. ML003765929). However, the page still exists in the TS, with the word "DELETED" printed over the figure. To be consistent with other figure deletions in TS, page 3-36b is proposed for replacement with a page containing only the words, "INFORMATION ON THIS PAGE HAS BEEN DELETED." The footer containing the page amendment history remains.

The NRC staff reviewed these TS changes, as proposed by the licensee, concerning previous deletions, and reviewed the amendment history for the affected pages to verify the accuracy of the licensee's assertions. The NRC staff agrees with the licensee's characterization of the history of these TS pages and concludes that the proposed changes do not alter the content of the current TS. The proposed changes only impact the representation of previously deleted information in the current TSs. Therefore, the NRC staff concludes that the proposed changes are not technical in nature, continue to comply with the provisions of 10 CFR 50.36, and are therefore, acceptable.

3.3 Consistency of the Terminology for Reactor Coolant System (RCS) Average Temperature and the Symbol "Δ"

The licensee has proposed certain changes that are designed to promote consistency in the way that the terminology for RCS average temperature is portrayed, as well as the symbol "Δ". The symbol "Δ" is used in the TMI-1 TS in several places referring to the reactivity status of the core.

- TOC TS section reference 1.2.10, on page "i," is proposed for revision to state "$T_{ave}$," as compared to "$^{T}$avg," consistent with the definition of RCS average temperature as described in TS Section 1.2.10.

- TS 1.2.1, 1.2.2, and 1.2.4.a on page 1-1 are proposed for revision to replace the term "Tavg" with "$T_{ave}$". This change utilizes subscript formatting and provides nomenclature consistent with the definition contained in TS Section 1.2.10.

- TS 3.5.2.1 and TS 3.5.2.2.a-c on page 3-33 are proposed for revision to remove the symbol "Δ" utilized as a symbol for the term "delta" and replace it with the written term "delta." This change is consistent with other sections of the TS, such as the definitions for COLD SHUTDOWN, HOT SHUTDOWN and REFUELING SHUTDOWN contained in TS definitions 1.2.1, 1.2.2, and 1.2.6, respectively. In addition to promoting consistency in the TS, the licensee states that this editorial change minimizes confusion over the symbol used and potential printing/copying errors.

- Similarly, TS 3.5.2.5.b.2 on page 3-35 is proposed for revision to remove the symbol "Δ" and replace it with the written term "delta."

- Also, in a similar manner, TS 3.6.3 on page 3-41 is proposed for revision to remove the symbol "Δ," utilized as a symbol for the term "delta."

The NRC staff reviewed the licensee's proposed changes to the terminology used for RCS average temperature and the symbol "Δ" and concludes that the proposed changes are not technical in nature, and do not change any TS values. The changes only impact the presentation of the relevant material and do not alter the intent of the applicable TSs. The changes promote consistency within the TS, therefore helping to minimize any confusion in the application of the TS to plant operation. Since the TS intent is not changed, the NRC staff concludes that the proposed changes continue to meet the provisions of 10 CFR 50.36, and are therefore acceptable.

3.4 Deletion of Information that is No Longer Applicable

In some cases, the TS may contain information that is intended for use for a specific evolution or time period. Once that evolution or time period passes the information becomes extraneous. The licensee has proposed the following deletions of information from the TS.

- The "*" in TS 3.1.13.1.a, and applicable note on page 3-18g, are proposed for deletion because this information is no longer applicable. This information applied only to installation and initial declaration of operability of RC-V42 and RC-V43 via TMI-1 TS Amendment 97, dated June 21, 1984 (ADAMS Accession No. ML003764807), and no longer applies.

- The "*" in TS 3.3.2 and applicable note on page 3-23 are proposed for deletion because this information is no longer applicable. This information applied only to TMI-1, Cycle 13. As of the date of the licensee's application, TMI-1 was operating in Cycle 19.

- The "*" in TS 3.7.2.c and applicable note on page 3-43 are proposed for deletion because this information is no longer applicable. This information applied only to TMI-1 on April 2, 2006, and no longer applies.

The NRC staff reviewed the licensee's application and the change history of the TMI-1 TSs, and agrees with the licensee that the three changes described above which remove the "*" and applicable note are no longer applicable to TMI-1. Since they are no longer applicable, their removal will not impact the TS adversely. Based on this consideration, the NRC staff concludes that the proposed changes continue to meet the provisions of 10 CFR 50.36, and are therefore acceptable.

3.5 Typographical Errors

The licensee proposes to revise TS 3.5.2.5.b.2 on page 3-35 to remove an erroneous period (.) which is present in the middle of a sentence, just before the word "inserted." The NRC staff reviewed the page 3-35 amendment history and determined that the extraneous period was inadvertently introduced with TMI-1 TS Amendment No. 219, dated January 1, 2000 (ADAMS Accession No. ML003674184). Therefore, the NRC staff agrees with the licensee that this is a typographical error, and that the removal of the erroneous period will not alter the meaning or intent of the TS. Since the meaning or intent of the TS is not changed, the NRC staff concludes that this proposed change continues to meet the provisions of 10 CFR 50.36, and is therefore acceptable.

By letter dated January 20, 2012, the licensee also has proposed a change to TS 5.1.1 to refer to Figure "5-1" versus Figure "5.1" in the text of that TS. The NRC staff reviewed the amendment history of TS 5.1.1 and discovered that the specification of Figure "5.1" was introduced with the clean copy pages of TMI-1 TS Amendment 218 (ADAMS Accession No. ML003670801). The previous amendment to this page, Amendment No. 149 (ADAMS Accession No. ML003765327), contains the correct reference to Figure "5-1" as reflected in the List of Figures (TS page vii), and the actual figure. The NRC staff, therefore, concludes that this change corrects a typographical error introduced inadvertently with Amendment No. 218. Based on this conclusion, as well as the NRC's determination that the requested change has no impact on plant safety, the NRC staff finds the proposed change acceptable.

3.6 Other Administrative Changes

The licensee submitted several other proposed changes that are described below:

(1) TS Table 4.1-1, Item 19.e on page 4-5 ("Test" column) is proposed for revision to remove an erroneous remark for a reference "(2)". According to the licensee, a review of the TS identified that the reference was added in TMI-1 TS Amendment No. 200, dated March 21, 1996 (ADAMS Accession No. ML003765807). The change request and associated NRC safety evaluation (SE) for Amendment No. 200 shows that the addition of the reference was not requested by the station or described in the SE. In addition, a reference "(2)" remark does not exist on the affected TS page. Therefore, the licensee proposes to remove this erroneous TS remark reference.

(2) TS Table 4.1-1 Item 25.a on page 4-5 is proposed for revision to delete the word "Coolant" in the Channel Description column. According to the licensee, Item 25a is associated with the Core Flood Tank and the word "Coolant" is misleading and incorrectly used.

(3) In TS 4.5.3 on page 4-43 the word "Specification" is proposed for deletion from the "Objective" statement and is relocated as a heading on the next line. To match the typical TMI-1 TS formatting, the heading "Specification" is proposed to be underlined. A period (.) has been proposed for addition to the "Objective" statement consistent with typical TMI-1 TS formatting.

(4) By letter dated January 20, 2012, the licensee proposed to revise the drawing title boxes for TS Figures 5-1 and 5-2 to reflect Exelon, the current TMI-1 licensee. TS Figure 5-3 is also proposed for a similar change, as requested in the licensee's letter dated October 18, 2011.

(5) Likewise, by letter dated January 20, 2012, the licensee proposed to revise TS 5.1.1 to reflect Exelon, the current TMI-1 licensee.

(6) The amendment revision section on the footer of page 3-33 is proposed for deletion to remove the note, "(5-18-76)."

Regarding item (1), the NRC staff independently reviewed the revision history for TMI-1 TS page 4-5 and agrees with the licensee that the reference "(2)" was added in TMI-1 Amendment No. 200. This change was not requested in the license amendment request. In fact, Amendment No. 200 changed Item 19(c) not 19(e). A review of the clean copy TS page issued with Amendment No. 200 does not indicate a revision bar next to that item, nor did reference (2) even exist in the TMI-1 TS at that time. Thus, it appears it was introduced inadvertently when the clean copy pages were provided by the licensee for Amendment No. 200 and the NRC staff review did not identify the discrepancy. Based on the fact that reference (2) is extraneous and the review of the change history indicates that a reference (2) never existed, the NRC staff concludes that reference (2) may be removed from TS Table 4.1-1 Item 19e.

Regarding item (2) above, the NRC staff reviewed the change history for TMI-1 TS page 4-5. The word "Coolant," as described above first appeared in TS Table 4.1-1 Item 25.a, with the issuance of TMI-1 TS Amendment No. 225, dated September 25, 2000 (ADAMS Accession No. ML003753524). The presence of the word "coolant" stems from the licensee's submittal dated July 27, 2000 (ADAMS Accession No. ML003736639), Enclosure 2, which included the intended revised page 4-5. It is apparent from the licensee's submittal description and the NRC's associated SE for Amendment No. 225 that this change was not intended. The NRC staff agrees with the licensee that the word "Coolant" in the content of Table 4.1-1, Item 25.a, is misleading and incorrectly used. Therefore, the NRC staff concludes that the removal of the word "Coolant" is appropriate, does not change the intent of the TS, and that the proposed change continues to meet the provisions of 10 CFR 50.36.

Regarding item (3) above, an NRC staff review of the revision history shows that this error was also introduced via TS Amendment No. 225, in a similar manner to item (2). The format issue stems from the licensee's submittal dated July 27, 2000 (ADAMS Accession No. ML003736639), Enclosure 2, which included the intended revised page 4-43. It appears that the Amendment No. 225 revised page, as submitted by the licensee, was missing a hard return after the word "operable" in the Objective, leading to the problem described above. It is apparent from the licensee's submittal description and the NRC's associated SE (ADAMS Accession No. ML003753524), that this change was not intended. The previous version of this page, TMI TS Amendment No. 212, dated June 21, 1999 (ADAMS Accession No. ML003765977), shows the proper format of this portion of TS page 4-43. The NRC staff agrees with the licensee that the changes proposed in this LAR will correct the mistake from Amendment No. 225 and restore this TS section to its originally intended structure. Further, the NRC staff concludes that the proposed change is purely administrative, does not change the intent of the TS, complies with the provisions of 10 CFR 50.36, and is therefore acceptable.

Regarding items (4) and (5), the NRC staff reviewed TMI Amendment No. 267, dated January 8, 2009 (ADAMS Accession No. ML082770568). This conforming amendment was intended to reflect the transfer of ownership for TMI-1 from AmerGen Energy Company, LLC (AmerGen), to Exelon. A review of that amendment showed that only the license pages were changed when the license transfer was made and the references to AmerGen in the TS were not changed. Thus, the proposed changes to TS Figures 5-1, 5-2, and 5-3, as well as TS 5.1.1, described in the licensee's letter dated January 20, 2012, regarding AmerGen, should have been made with Amendment No. 267. Since the proposed changes correct references previously authorized by Amendment No. 267, the NRC staff concludes that no further evaluation is necessary, and that the proposed changes are acceptable.

Regarding item (6), page 3-33, the NRC reviewed the amendment history of this page. The date proposed for deletion corresponds to the date of first amendment for this TS page (Amendment No. 17), and appears to have been inadvertently introduced into the TS with TMI-1 TS Amendment No. 211, dated June 15, 1999 (ADAMS Accession No. ML003765996). The NRC staff concludes that having this date in the footer is extraneous information that is no longer applicable, and agrees that it can be deleted without impact to the TS.

3.7 NRC Staff Technical Evaluation Conclusion

As described above, the NRC staff has reviewed the licensee's submittals and concludes that the proposed changes do not alter the technical content of the TS, meet the provisions of 10 CFR 50.36, and are acceptable.

## 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendment. The State official had no comments.

## 5.0 ENVIRONMENTAL CONSIDERATION

The amendment makes editorial, corrective, or other minor revisions. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (76 FR 77567). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(10)(v). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

## 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: P. Bamford

Date: May 7, 2012

May 7, 2012

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 - ISSUANCE OF AMENDMENT RE: ADMISTRATIVE TECHNICAL SPECIFICATION CHANGES (TAC NO. ME7357)

Dear Mr. Pacilio:

The Commission has issued the enclosed Amendment No. 278 to Renewed Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit 1 (TMI-1), in response to your application dated October 18, 2011[1], as supplemented by additional letters[2].

The amendment involves administrative changes. The changes include correcting typographical errors, making format changes, clarifying symbols and pages, reformatting of previously deleted pages, incorporating a consistent abbreviation of average reactor coolant temperature, deleting notes that are no longer applicable, and replacing certain drawing figures with versions that have a corrected title block.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

*/ra/*

Peter J. Bamford, Project Manager
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosures: 1. Amendment No. 278 to DPR-50
2. Safety Evaluation

cc w/encl: Distribution via Listserv

DISTRIBUTION
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**ADAMS Accession No.: ML121080437**

| OFFICE | LPL1-2/PM | LPLI-2/LA | OGC | LPL1-2/BC |
|---|---|---|---|---|
| NAME | PBamford | ABaxter (SLittle for) | SUttal | MKhanna |
| DATE | 4/26/12 | 4/26/12 | 5/1/12 | 5/7/12 |

**Official Record Copy**

1. Agencywide Documents Access and Management System (ADAMS) Accession No. ML112911548.
2. January 20, 2012 (ADAMS Accession No. ML12020A091) and April 11, 2012 (ADAMS Accession No. ML12102A134).