



# Exelon Generation®

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April 16, 2014

TMI-14-053

U. S. Nuclear Regulatory Commission, Region I  
Attn: Document Control Desk  
Washington, D.C. 20555

THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1)  
RENEWED FACILITY OPERATING LICENSE NO. DPR-50  
DOCKET NO. 50-289

SUBJECT: BIENNIAL 10 CFR 50.59 AND COMMITMENT REVISION REPORTS FOR  
2012 AND 2013

Enclosed are the 2012 – 2013 Biennial 10 CFR 50.59 and Commitment Revision Reports as required by 10 CFR 50.59(d)(2) and SECY-00-0045 (NEI 99-04).

There are no regulatory commitments contained in this transmittal.

If you have any questions or require additional information, please contact Mike Fitzwater, of Regulatory Assurance, at 717-948-8228.

Sincerely,

 For M. Newcomer

Mark Newcomer  
Plant Manager, TMI-1  
Exelon Generation Co., LLC

MN/mdf

Enclosure

cc: USNRC Regional Administrator, Region I  
USNRC Project Manager, TMI  
USNRC Senior Resident Inspector, TMI

IE47  
NRR

**THREE MILE ISLAND  
UNIT 1  
DOCKET NO. 50-289  
BIENNIAL 10 CFR 50.59 AND COMMITMENT REVISION REPORTS**

**TABLE OF CONTENTS**

10 CFR 50.59 Report	2
Modifications	3
Procedure Changes	6
Commitment Revision Report	7

**EXELON CORPORATION  
THREE MILE ISLAND  
UNIT 1  
DOCKET NO. 50-289**

**BIENNIAL 10 CFR 50.59 REPORT  
JANUARY 1, 2012 THROUGH DECEMBER 31, 2013  
10 CFR 50.59 EVALUATION SUMMARIES**

### **Modifications**

Title: ECR 11-00487 – 50.59 Evaluation for River Stage Discharge Analysis

Year Implemented: 2012

Evaluation Number: Engineering Change Request No. TM 11-00487  
ECR TM-11-00487

#### **Brief Description:**

“River Stage Discharge and Discharge Frequency Analysis” (C-1101-122-E410-003 R0) has been completed. The affected design and licensing documents were updated based on the results of that analysis. The revised conclusions of the stage discharge analysis are not based on a change in design at TMI. The change is a product of updated gage data from Marietta USGS station, recent topographical and bathymetric surveys, the post Agnes configuration of the Shocks Mill Railway bridge, and calibration of the model to 1972 flood (1,002,000 CFS) versus 1936 flood (740,000 CFS).

The new analysis predicted a peak water surface elevation during a probable maximum flood is higher and the predicted frequency of occurrence of a probable maximum flood is lower than previously predicted. The net affect of complete results of the new analysis is no adverse impact on nuclear safety. TMI-1 flood protection was previously improved. The probability of an event where the river water level exceeds the flood protection is lower than understood during original licensing.

#### **Summary of Conclusion for the Activity’s 50.59 Review:**

An evaluation of affects of the higher PMF water surface elevation was completed. The key conclusions included that there is no increase in the likelihood of malfunction of the dike or flood barrier system and the frequency of occurrence of a PMF has not increased. Therefore, these changes do not require prior NRC approval.

\* \* \* \* \*

Title: ECR 12-00129 – 50.59 Evaluation for TMI-1 50.2 EFPY P-T Limits

Year Implemented: 2012

Evaluation Number: Engineering Change Request No. TM 12-00129  
ECR TM-12-00129

**Brief Description:**

The proposed activity will update Reactor Coolant System (RCS) Pressure-Temperature (P-T) limits for continued plant operation through 50.2 Effective Full Power Years (EFPY). The changes to the existing P-T limits implemented by this modification include: Replacement of the heat up and cooldown curves found in Technical Specifications (TS) Figures 3.1-1 and 3.1-2; the adjustment of the Power Operated Relief Valve (PORV) Low Temperature Overpressure Protection (LTOP) setpoint from 552 psig to 592 psig; establishment of new heat up and cooldown LTOP enable temperature from 329 degF to 313 degF; and the revision of the existing P-T limits related TS 3.1.2.4 commitment for operation beyond 50.2 EFPY.

A License Amendment Request (LAR) was prepared for this modification to request NRC approval for the use of the BAW-2308 methodology for the determination of the initial Reference Temperature Nil Ductility Transition ( $RT_{NDT}$ ) for the Linde 80 Reactor Vessel (RV) beltline weld materials. The use of the BAW-2308 methodology is an exception to the requirements of 10CFR50, Appendix G and 10CFR50.61 for the determination of initial  $RT_{NDT}$ , used for the determination of the Adjusted Reference Temperature (ART) and Reference Temperature for Pressurized Thermal Shock ( $RT_{PTS}$ ) for RV beltline materials. The LAR will also request NRC approval for the changes to various technical specifications related to the RCS P-T limits. Implementation of the design analyses and procedure changes will be addressed in the 50.59 screening.

Multiple procedures will also be updated to implement the revised P-T limits and the PORV setpoint change for operation through 50.2 EFPY.

The reason for the activity is due to the existing RCS P-T limits as provided in the TS are applicable for plant operation through 29 EFPY. TS 3.1.2.4 states, "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 10CFR50, Appendix G." Plant operation is approaching the 29 EFPY limit, therefore it is necessary to replace the existing P-T limits to ensure plant operation beyond 29 EFPY.

The effect of the activity is that this modification will implement updated P-T limits intended for plant operation through 50.2 EFPY to replace the existing P-T limits for plant operation through 29 EFPY. Specifically, this modification will provide:

- Revised PORV LTOP setpoint (TS 3.1.12.2a.2)

- Revised P-T limits (curves) for RCS heat up / cooldown and ISLH operations (TS Figures 3.1-1 and 3.1-2)
- Revised heat up and cooldown LTOP enable temperatures (TS 3.1.12.1, 3.1.12.2.a.1, 3.1.12.3, 3.1.12 Bases, and 4.5.2.1.c.1)
- Revise the commitment to update TS P-T limits to the next service period prior to exceeding 50.2 EFPY (TS 3.1.2.4)

Use of the updated P-T limits will ensure continued safe operation of the TMI-1 RCS through 50.2 EFPY. The intended actions within the procedures remain the same. There is no adverse impact on plant operations on how RCS heat up and cooldown is performed during planned and unplanned (emergency) situations.

This modification will require NRC acceptance of the TMI-1 license amendment request for the use of the BAW-2308 methodology to determine the initial RT<sub>N</sub>DT of the RV beltline Linde 80 weld material and to implement updated TS P-T limits.

#### Summary of Conclusion for the Activity's 50.59 Review:

The Screening review of this proposed activity determined that a 10CFR50.59 evaluation must be performed to determine the acceptability for the use of the BAW-2308 alternative methodology for the determination of the initial RT<sub>N</sub>DT of the RV beltline Linde 80 weld material. Further, the NRC must approve a LAR for the use of the BAW-2308 methodology, and to implement TS changes described above.

The 10CFR50.59 evaluation prepared for the use of the BAW-2308 methodology demonstrates that this methodology may be used with no adverse effects on the design basis of any equipment, either safety related or non-safety related. This modification includes updates to the UFSAR in accordance with 10CFR50.71(e).

For all other portions of this modification, the modification may be implemented with no adverse effects on the design basis of any equipment, either safety related or non-safety related. Further, all impacts have been evaluated to ensure that there are no adverse effects on plant equipment operation and personnel activities involved with implementation of the new P-T limits, the new LTOP enable temperatures, and the new LTOP PORV setpoint.

\* \* \* \* \*

### **Procedure Changes**

There were no 10 CFR 50.59 required procedure changes for this reporting period.

End of 10 CFR 50.59 Revision Report

**EXELON CORPORATION  
THREE MILE ISLAND  
UNIT 1  
DOCKET NO. 50-289**

**BIENNIAL COMMITMENT REVISION REPORT  
JANUARY 1, 2012 THROUGH DECEMBER 31, 2013**



Letter Source: IEB 90-01: Loss of Fill Oil in Rosemount Transmitters

Exelon Tracking No.: 1990T0027 / 1122355-96

Nature of Commitment: GPUN committed to the NRC in its response to IEB 90-01 to:

1. Plot at least quarterly the control room log readings for the 12 low static pressure/non-safety related actuation functions to assure correct transmitter operation.
2. Trend calibration data for those Rosemount Transmitters identified as being in standby service and do not yield useful operating point trend data.

Summary of Justification:

Commitment Change Evaluation Form 12-01 revised this commitment from "Continuing" to "Historical". During a review of licensing commitments, it was determined that CMT: 1990T0027 related to Rosemount transmitter loss of fill oil may be deleted since the action was completed in 1992. The commitment was to plot control room indications and to trend calibration data until the affected transmitters were replaced. Close out of Licensing Action Item 90-9157 on Jan 22, 1992 documents completion of the action. This commitment is no longer needed since the action to replace the affected transmitters is complete.

\* \* \* \* \*

Letter Source: C311-93-3140

Exelon Tracking No.: 1993T0027 / 1122355-63

Nature of Commitment: This verbal agreement was reflected in the cover letter and the SER for Tech Spec Amendment No. 175. The cover letter stated "The approval of this amendment is conditioned on the understanding that "Load Test", as used in TS Section 4.6.2, "Station batteries," is interpreted to mean a modified performance test as described in IEEE Standard 450." The reference standard agreed to was IEEE standard 450-93 (Revision of IEEE standard 450-1987), an unapproved draft with revision date of November 16, 1992. To expedite NRC issuance of the amendment in time to support the TSCR 206, "24 month cycle surveillance extensions" for those surveillance coming due, the commitment was not described in GPUN correspondence or the TS Bases, the modified performance test was incorporated into 1303-11.11, Rev. 21 (effective 8/6/93).

Summary of Justification:

Commitment Change Evaluation Form 12-03 revised this commitment. Commitment revision was made due to the unavailability of IEEE 450-1993 in TMI database. Commitment was revised to IEEE 450-1995 since this was the approved version of this standard.

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Letter Source: C311-92-2003: Safety Evaluation for compliance with 10CFR50.62 ATWS TAC 59151

Exelon Tracking No.: 1992T0018 / 1122355-60

Nature of Commitment: GPUN committed to the NRC to maintain ATWS diversity in a programmatic manner different from the referenced in the NRC Safety Evaluation Report (SER) referenced. This commitment requires that the diversity stipulation be captured in the UFSAR as well as in the Engineering Data Bases found in the computer based systems used to control repairs/replacements (GMS-2 Programs Resident on the IMSP Platform within the GPUN mainframe computer system. This phrase was replaced with the generic computer based system per CCT #07-020)

Summary of Justification:

Commitment Change Evaluation Form 12-05 revised this commitment. During a review of licensing commitments, it was determined that this commitment has been completed by an update to the UFSAR and by the ATWS field in PIMS. The ATWS diversity requirements are captured in UFSAR section 7.1.5. There is an ATWS field in the PIMS codes and classifications screens for all components.

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Letter Source: 5211-82-2301: GL 81-14: EFW Seismic Qualification

Exelon Tracking No.: 1982T0008 / 1122072-46

Nature of Commitment: GPUN committed to the NRC to isolate the emergency feedwater system by closing CO-V-111A/B and CO-V-14 A/B whenever a tank reached the technical specification limit following any EFW actuation at restart and during the interim period before the long term modifications are complete, following any recognizable seismic event.

Summary of Justification:

Commitment Change Evaluation Form 12-06 revised this commitment. During a review of this licensing commitment, it was determined that this commitment has been completed with added notation that the requirement to close CO-V-111A, CO-V-111B, CO-V-14A and CO-V-14B has been retained after the modifications were completed per commitment 1983T0046.

\* \* \* \* \*

Letter Source: GL 88-17: Expeditious Action 1

Exelon Tracking No.: 1998T0128 / 1122355-45

Nature of Commitment: Discuss the event that occurred at Diablo Canyon Nuclear Station and provide training on the event prior to entering a reduced inventory condition. This event involved a loss of residual heat removal while the reactor was shutdown and the core was in a reduced inventory condition.

Summary of Justification:

Commitment Change Evaluation Form 12-08 revised this commitment. There has been significant change at TMI – 1 and throughout the Nuclear Industry since 1988 regarding the control of plant systems during outages to ensure fuel protection. Shutdown safety is now addressed in the TMI 1 Long Range Training Plan and in OU-TM-103.

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Letter Source: IEN 86-03: ECCS failure due to Recirculation Valve

Exelon Tracking No.: 1986T0016 / 1122355-19

Nature of Commitment: GPUN committed to the NRC that the TMI-1 ECCS pump recirculation line design is acceptable.

Summary of Justification:

Commitment Change Evaluation Form 12-09 revised this commitment. Memo 3310-86-0118 documents the review of the results for the potential for a loss of minimum flow paths leading to ECCS pump damage during a LOCA. The report determined that TMI-1 does have a single recirculation line for the HPI pumps which is isolated automatically on ES actuation. The design was determined to be acceptable because: 1) The HPI pumps are high head and will provide enough flow at maximum RCS pressure to protect the pump for ES, 2) Loss of power does not isolate the recirculation line, and 3) the minimum flow requirements when HPI is manually throttled are addressed in procedures. Same issue addressed in IEN 85-94

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Letter Source: Licensing Letter 6710-96-2097: GL 89-013: REVISED RESPONSE

Exelon Tracking No.: 603573-10-34 / 1122072-01

Nature of Commitment: The Generic Letter states "Confirm that maintenance practices, operating and emergency procedures, and training that involves the service water system are adequate to ensure

that safety-related equipment cooled by the service water system will function as intended and that operators of this equipment will perform effectively. This confirmation should include recent (within the past 2 years) reviews of practices, procedures, and training modules.

The response letter states "TMI-1 procedures are reviewed on a biennial basis which provides reasonable assurance that TMI-1 procedures are current and reflect plant configuration. GPUN personnel review maintenance, operating, surveillance, emergency procedures, etc., dealing with open and closed cycle service water systems via this biennial review process. In addition to the biennial review, other procedural changes are made as the result of vendor recommendations, plant modifications, License Amendments, etc. Furthermore, QA audits similar to those discussed in the response to Recommended Action IV, also serve to confirm the adequacy of procedures related to service water systems.

The TMI Training Department program for reviewing and maintaining lesson plans ensures that equipment and procedure changes are incorporate in lesson plans and that lesson plans are maintained current. Additional training is accomplished through on-the-job training, industrial experience, meetings, etc.

The recent Service Water System Self Assessment reviewed procedures and witnessed the use of procedures in response to a system transient at the TMI-1 simulator. This Self Assessment also reviewed training activities. The results found the procedures and training to be in good condition and operators knowledgeable of the procedures.

Thus GPU Nuclear has confidence that our current procedure and training program provide assurance that the safety-related equipment, and the Control Building chiller system, cooled by service water systems will perform their intended function and that operators of this equipment will perform effectively."

#### Summary of Justification:

Commitment Change Evaluation Form 12-10 revised this commitment. The Generic Letter asks for a confirmation of the adequacy of maintenance practices and operational procedures. This confirmation has been completed. The statements regarding continuing beyond the original scope of Action V of GL 89-13. These continuing procedural reviews and maintenance of training lesson plans are not a part of the GL 89-13 program but rather the QATR.

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Letter Source: CAL NRR-07-029 (5928-07-20044)): SUPPLEMENTAL RESPONSE REGARDING INSPECTION AND MITIGATION OF ALLOY 600/82/182 PRESSURIZER BUTT WELDS

Exelon Tracking No.: 1122355-80 / 603573-10

Nature of Commitment: The commitments associated with Passport 607832 are the result of required actions from 2007 for Alloy 600 degradation in pressurizer Dissimilar Metal Welds (DMW). Specifically TMI committed to:

1. Certain action levels for RCS leakage until the required six pressurizer welds (five locations) were inspected by UT or mitigated. The welds were inspected or mitigated during the 2007 refueling outage. The action levels have not been applicable since the 2007 refueling outage. Reference Passport assignment 607832.01 for the inspection/mitigation processes reported to the NRC.
2. Report inspection results to the NRC within 60 days of completion. Passport assignments 607832.01, .08, and .09 fulfilled the reporting commitments.
3. Re-examine the pressurizer spray nozzle dissimilar metal butt welds within four years if not mitigated prior to the Fall 2011 refueling outage. The pressurizer spray butt welds were examined and mitigated during the Fall 2011 refueling outage so this commitment is no longer applicable (reference passport assignment 607832.09 for reporting details).

Summary of Justification:

Commitment Change Evaluation Form 12-12 revised this commitment. All six pressurizer DMW butt welds associated with CAL NRR-07-029 are now mitigated and the commitment is no longer applicable. See Letter TMI-11-166.

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Letter Source: LAR 96075.054 (GPUN Letter 1920-98-20242) and LAR 96075.08 (GPUN Letter 1920-99-20019)

Exelon Tracking No.: 1122072-28 & 30

Nature of Commitment: In response to NRC Generic Letter 96-05, Three Mile Island Unit 1 committed to implement the Joint Owners Group (JOG) Program for Motor Operated Valve Periodic Verification in accordance with MPR-1807 (Interim) and MPR-2524-A Rev.1

(Final). Note: Not all GL96-05 MOV Program Valves are within the scope of the Final JOG Program.

Summary of Justification:

Commitment Change Evaluation Form 12-13 revised this commitment. The JOG Class D MOVs have been installed at Three Mile Island Unit 1 prior to 1989. Three Mile Island Unit 1 is following the JOG Program requirements to develop and justify an alternative method to address service related degradation. While this method is not reviewed and approved by the NRC, an engineering evaluation has been performed in order to justify its use.

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Letter Source: 6710-96-2096 Attachment 1 GL 89-013: REVISED  
RESPONSE - SERVICE WATER SYSTEM PROBLEMS  
AFFECTING SAFETY RELATED EQUIPMENT

Exelon Tracking No.: 1122072-01

Nature of Commitment: The Emergency Cooling Coils will be subject to a combination of visual inspections and trending. Visual inspection of the air side and monitoring of air and water flows will occur each outage.

Summary of Justification:

Commitment Change Evaluation Form 13-01 revised this commitment to monitor of air flows to every other outage. The purpose of PM009409 is to monitor the air flow through the RB containment coolers AH-E-1A/B/C. The flows are measured at low fan speed (emergency operating conditions) and high speed normal cooling operation. The PM monitors air flow only and is an assessment of the amount of flow obstructions (clogged fins) in the cooling coils. The historical basis for this PM was to ensure that the coolers do not become clogged with boron deposits as a result of RCS leakage which condenses out onto the coiling coils. During power operations the air flow through AH-E-1A/B/C is monitored and trended per GA003857. Therefore an adverse trend in containment cooler air flow would be detected. In addition, during refueling the cooling coils are visually inspected for deposits/ flow obstructions and cleaned as needed per PM208879. Consequently sufficient barriers and monitoring are currently in place to warrant changing the 1R commitment of PM009409 to 2R.

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Letter Source: NUREG-1928

Exelon Tracking No.: 603573-11

Nature of Commitment: UFSAR Appendix A section A.2.1.11 Inspection of Overhead Heavy Load and Light Load (related to refueling) Handling

Systems (Attachment A of this review) states: Inspection frequency is annually for cranes and hoists that are accessible during plant operation and every 2 years for cranes and hoists that are only accessible during refueling outages.

NRC SER section 3.0.3.2.7 Inspection of Overhead Heavy Load and Light Load (related to refueling) Handling Systems states (pg 3-56) the commitment appropriately, so no clarification is necessary: Some more infrequently used cranes have an inspection frequency of either two years, or inspection prior to use.

The SER Appendix A, Commitment for License Renewal of TMI-1 requires no clarification, since there is no mention of the frequency of the inspections.

Summary of Justification:

Commitment Change Evaluation Form 13-02 revised this commitment. To make TMI's UFSAR match TMI's SER (NUREG-1928) from The NRC, which is consistent with the GALL (NUREG 1801) rev. 2 The GALL rev. 2 is the most recent and up to date guidance provided by the NRC.

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