

December 3, 2010

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Limerick Generating Station, Units 1 and 2  
Facility Operating License Nos. NPF-39 and NPF-85  
NRC Docket Nos. 50-352 and 50-353

**Subject:** License Amendment Request Response to Additional Questions  
Proposed Technical Specification Allowed Outage Time Extensions to Support  
Residual Heat Removal Service Water Maintenance

- References:**
1. Letter from Pamela B. Cowan (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request, Proposed Changes to Technical Specifications Sections 3.5.1, 3.6.2.3, 3.7.1.1, 3.7.1.2 and 3.8.1.1 to Extend the Allowed Outage Times," dated March 19, 2010.
  2. Letter from Peter Bamford, U.S. Nuclear Regulatory Commission, to Michael J. Pacilio, Exelon Nuclear, "Limerick Generating Station, Units 1 and 2 - Request for Additional Information Regarding Proposed Technical Specification Allowed Outage Time Extensions to Support Residual Heat Removal Service Water (RHRSW) Maintenance (TAC Nos. ME3551 And ME3552)," dated September 21, 2010.
  3. Letter from Pamela B. Cowan (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information, License Amendment Request, Proposed Technical Specification Allowed Outage Time Extensions to Support Residual Heat Removal Service Water Maintenance," dated October 29, 2010.
  4. Electronic mail message from Peter Bamford, U.S. Nuclear Regulatory Commission, to Glenn Stewart, Exelon Generation Company, LLC, "Limerick RHRSW Call - RAI Follow-up Questions," dated November 8, 2010 (ADAMS Accession No. ML103210138).

In Reference 1, Exelon Generation Company, LLC (Exelon) requested changes to the Technical Specifications (TS), Appendix A of Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively. The proposed changes would extend the TS allowed outage time (AOT) for the Unit 1 and Unit 2 Suppression Pool Cooling (SPC) mode of the Residual Heat Removal (RHR) system, the Residual Heat Removal Service Water (RHRSW) system, the Emergency Service Water (ESW) system, and the A.C. Sources - Operating (Emergency Diesel Generators) from 72 hours to seven (7) days in order to allow for repairs of the RHRSW system piping.

The NRC reviewed the license amendment request and identified the need for additional information in order to complete its evaluation of the amendment request. In Reference 2, the NRC formally issued the request for additional information (RAI). In Reference 3, Exelon provided a response to the RAI.

Subsequently, additional questions regarding the responses to RAI questions 8.c, 8.e, and 6.b provided in Attachment 1 of Reference 3 were sent from the NRC to Exelon by electronic mail message on November 8, 2010 (Reference 4). The additional questions were discussed during a conference call with the NRC on November 9, 2010. Attachment 1 to this letter provides a restatement of the additional questions along with Exelon's responses.

Exelon has concluded that the information provided in this response meets the intent of the original submittal (Reference 1) and does not impact the conclusions of the: 1) Technical Analysis, 2) No Significant Hazards Consideration under the standards set forth in 10 CFR 50.92(c), or 3) Environmental Consideration as provided in the original submittal (Reference 1).

This supplement contains revised regulatory commitments to implement the compensatory measures during the extended AOTs. In particular, Regulatory Commitment Nos. 1 and 3 discussed in Attachment 4 of Reference 3 are revised based on the attached supplemental information. The revised commitments are provided in Attachment 2 to this letter and supersede the corresponding Regulatory Commitment Nos. 1 and 3 previously described in Attachment 4 of Reference 3.

If you have any questions or require additional information, please contact Glenn Stewart at 610-765-5529.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 3rd day of December 2010.

Respectfully,



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Pamela B. Cowan  
Director, Licensing & Regulatory Affairs  
Exelon Generation Company, LLC

Attachment 1: Response to Additional Questions  
Attachment 2: Summary of Regulatory Commitments

cc:	Regional Administrator - NRC Region I	w/ attachments
	NRC Senior Resident Inspector - Limerick Generating Station	"
	NRC Project Manager, NRR - Limerick Generating Station	"
	Director, Bureau of Radiation Protection - Pennsylvania Department of Environmental Protection	"

**ATTACHMENT 1**

**License Amendment Request**

**Limerick Generating Station, Units 1 and 2  
Docket Nos. 50-352 and 50-353**

**Proposed Technical Specification Allowed Outage Time Extensions  
to Support Residual Heat Removal Service Water Maintenance**

**Response to Additional Questions**

**RESPONSE TO ADDITIONAL QUESTIONS  
PROPOSED TECHNICAL SPECIFICATION ALLOWED OUTAGE TIME EXTENSIONS  
TO SUPPORT RESIDUAL HEAT REMOVAL SERVICE WATER MAINTENANCE**

In Reference 1, Exelon Generation Company, LLC (Exelon) requested changes to the Technical Specifications (TS), Appendix A of Operating License Nos. NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively. The proposed changes would extend the TS allowed outage time (AOT) for the Unit 1 and Unit 2 Suppression Pool Cooling (SPC) mode of the Residual Heat Removal (RHR) system, the Residual Heat Removal Service Water (RHRSW) system, the Emergency Service Water (ESW) system, and the A.C. Sources - Operating (Emergency Diesel Generators) from 72 hours to seven (7) days in order to allow for repairs of the RHRSW system piping.

The NRC reviewed the license amendment request and identified the need for additional information in order to complete its evaluation of the license amendment request (LAR). In Reference 2, the NRC formally issued the request for additional information (RAI). In Reference 3, Exelon provided a response to the RAI.

Subsequently, additional questions regarding the responses to RAI questions 8.c, 8.e, and 6.b provided in Attachment 1 of Reference 3 were sent from the NRC to Exelon by electronic mail message on November 8, 2010 (Reference 4). The additional questions were discussed during a conference call with the NRC on November 9, 2010. The additional questions are restated below along with Exelon's responses.

- 1. Response to 8.c:** The issue here was that the commitment to verify the system alignments periodically was not described as to how it would be accomplished. In their response, the licensee has only restated the intent to periodically verify the alignment. The NRC staff still does not know or have a commitment which tells us how the licensee is physically accomplishing this – i.e., will the licensee run a test, do flow verification, or simply check some valves and breakers, or are they going to verify every component is properly aligned including local valves, etc.?

Response

Verification of the RHRSW and ESW system alignments will be accomplished by locally verifying boundary valve and power supply position in accordance with a check-off list contained in the special procedure developed specifically to govern plant operations while in the extended AOTs (refer to revised Regulatory Commitment No. 1 in Attachment 2).

- 2. Response to 8.e:** The issue was that the commitment has not adequately clarified the meaning of “switchyard activities that adversely affect risk exposure.” In their response, the licensee has stated that these are activities which have the “potential to cause a total loss of offsite power.” It is still not clear as to what this includes, and the NRC requests that the licensee be more specific.

### Response

Compensatory measure #3 has been redefined as shown below (refer to revised Regulatory Commitment No. 3 in Attachment 2).

3. Activities in the switchyard that adversely affect risk exposure are those that have the potential to cause a loss of offsite power, such as testing and maintenance activities. Therefore, testing and discretionary maintenance will be prohibited during the RHRSW subsystem piping repairs in the at-power unit switchyard and on equipment in the outage unit switchyard supporting operability of its offsite source. Accordingly, during the RHRSW subsystem piping repairs, the at-power unit switchyard will be protected in its entirety using either a lock and/or chain different than that used for normal access to the switchyard, or a physical barrier placed in front of the gate used for normal access to the switchyard. In addition, equipment in the outage unit switchyard supporting operability of its offsite source will be protected during the RHRSW subsystem piping repairs using protected equipment signs and physical barriers, such as barrier rope, physical devices, tape, etc., to prevent access to the equipment. This will be controlled through applicable corporate and station procedures for equipment protection, and through the special procedure developed specifically to govern plant operation while in the extended AOTs.

3. **Response to RAI 6.b**, regarding multiple spurious actuations modeling assumptions: The licensee identifies that a site review of multiple spurious operations (MSO) scenarios was conducted, and that MSOs of concern were entered into the corrective action program. The licensee then states that ultimately these items will be dispositioned by hardware changes or viable operator actions, and that this approach, in consideration of the low probability of MSOs, ensures a negligible impact on the fire PRA and the delta risk calculations. The low probability of MSOs is not an acceptable justification for neglecting their impact on a risk calculation, and any future changes to plant configuration or operation to disposition an MSO has no impact on the risk calculations done to support this application. Therefore, the licensee needs to justify that those MSOs entered into the corrective action program are not significant for the risk calculations performed in support of this request.

### Response

LGS is addressing MSOs in accordance with the NEI 00-01 (Reference 5). As part of this process, an expert panel was conducted in 2009 to disposition the generic Boiling Water Reactor (BWR) MSO scenarios and identify additional site specific MSOs. MSOs of concern have been entered into the corrective action program to determine their impact on fire safe shutdown. The impact of those MSOs has been determined to be inconsequential with respect to the license amendment request (LAR) to extend the RHRSW/ESW AOTs based on the following considerations:

- When the MSOs were entered into the corrective action program, alternative compensatory measures were established per the guidance provided in Regulatory Issue Summary 2005-07, "Compensatory Measures to Satisfy the Fire Protection Program Requirements," dated April 19, 2005. The impact of the compensatory measures (which will be in place until the corrective action is implemented) is to

minimize the potential risk associated with MSOs. These compensatory measures will in-turn minimize the risk associated with the increased AOT requested in the LAR.

- During the RHRSW system piping repairs, the dominant contribution to the increase in CDF identified in the LAR is related to long term loss of decay heat removal scenarios. Similarly, the dominant scenarios from fire risk are also related to long term loss of decay heat removal scenarios. In the unlikely situation a fire were to occur and an MSO were to impact the RHRSW system during the increased AOT requested in the LAR, compensatory measures have already been identified to brief shift operators on alternate measures that might be necessary to employ given a loss of the RHRSW system (refer to Commitment #6 in the original LAR and in Attachment 4 of Reference 3). Therefore, the impact of potential MSOs that could impact the RHRSW system is minimized by the implementation of the previously identified compensatory measures.
- The principally degraded safety function during the extended RHRSW/ESW AOTs to support the performance of the RHRSW system piping repairs is decay heat removal. This is consistent with the dominant risk contributors identified above being related to long term loss of decay heat removal scenarios. Other safety functions will be minimally degraded based on the verification of available equipment that has already been identified as part of the compensatory measure commitments that were included in the original LAR as modified by Attachment 4 to Reference 3. Therefore, the risk impact of potential MSOs that could affect other safety functions during the extended AOT is minimal.
- The LGS design is such that the other safety functions that could be impacted by the MSOs and that could be important to the risk assessment (e.g., inventory control) are comprised of redundant and diverse systems and components. Several redundant trains and components have already been identified to be protected through the use of protected equipment signs and physical barriers, such as barrier rope, physical devices, tape, etc., to prevent access to the equipment, as well as prohibiting testing and discretionary maintenance on the protected equipment as part of the committed compensatory measures for the LAR. These previously identified compensatory measures will also minimize the risk associated with other potential MSO impacts.
- All of the compensatory measures identified as part of the LAR submittal and subsequent RAI responses will in general reduce the risk associated with the extended AOT configuration. Since the MSO impacts would identify the same set of systems and components and operator actions as potentially important, these previously identified compensatory measures will also minimize the risk associated with the potential MSO impacts.

In summary, the qualitative evaluation provided above supports the conclusion that those MSOs that have been entered into the corrective action program are not significant for the risk calculations performed in support of the LAR to extend the RHRSW/ESW AOTs in support of the RHRSW system piping repairs.

## REFERENCES

1. Letter from Pamela B. Cowan (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request, Proposed Changes to Technical Specifications Sections 3.5.1, 3.6.2.3, 3.7.1.1, 3.7.1.2 and 3.8.1.1 to Extend the Allowed Outage Times," dated March 19, 2010.
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5. NEI 00-01, "Guidance for Post Fire Safe Shutdown Circuit Analysis," Revision 2, May 2009.

**ATTACHMENT 2**

**License Amendment Request**

**Limerick Generating Station, Units 1 and 2  
Docket Nos. 50-352 and 50-353**

**Proposed Technical Specification Allowed Outage Time Extensions  
to Support Residual Heat Removal Service Water Maintenance**

**Summary of Regulatory Commitments**

### SUMMARY OF REGULATORY COMMITMENTS

Regulatory Commitment Nos. 1 and 3, as discussed in Attachment 4 of Reference 3, are revised based on the supplemental information provided in Attachment 1 to this letter. The following table provides the revised regulatory commitments, which supersede the corresponding Regulatory Commitment Nos. 1 and 3 previously described in Attachment 4 of Reference 3. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

<b>Current Commitment (Based on Attachment 1 Response to Additional Questions)</b>
<p>1. The following action will be taken prior to entry into the proposed configuration:</p> <ul style="list-style-type: none"><li>○ Proper standby alignment of the operable RHRSW subsystem will be ensured by local verification of boundary valve and power supply position in accordance with a check-off list contained in the special procedure developed specifically to govern plant operations in the extended AOTs.</li></ul>
<p>3. Activities in the switchyard that adversely affect risk exposure are those that have the potential to cause a loss of offsite power, such as testing and maintenance activities. Therefore, testing and discretionary maintenance will be prohibited during the RHRSW subsystem piping repairs in the at-power unit switchyard and on equipment in the outage unit switchyard supporting operability of its offsite source. Accordingly, during the RHRSW subsystem piping repairs, the at-power unit switchyard will be protected in its entirety using either a lock and/or chain different than that used for normal access to the switchyard, or a physical barrier placed in front of the gate used for normal access to the switchyard. In addition, equipment in the outage unit switchyard supporting operability of its offsite source will be protected during the RHRSW subsystem piping repairs using protected equipment signs and physical barriers, such as barrier rope, physical devices, tape, etc., to prevent access to the equipment. This will be controlled through applicable corporate and station procedures for equipment protection, and through the special procedure developed specifically to govern plant operation while in the extended AOTs.</p>