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10 CFR 50  
10 CFR 51  
10 CFR 54

June 17, 2013

U. S. Nuclear Regulatory Commission  
Attention: 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: 10 CFR 54.21(b) Annual Amendment to the Limerick Generating Station License  
Renewal Application and Review of Interim Staff Guidance

References: 1. Exelon Generation Company, LLC letter from Michael P. Gallagher to NRC  
Document Control Desk, "Application for Renewed Operating Licenses", dated  
June 22, 2011  
2. Exelon Generation Company, LLC letter from Michael P. Gallagher to NRC  
Document Control Desk, "10 CFR 54.21(b) Annual Amendment to the Limerick  
Generating Station License Renewal Application", dated June 14, 2012  
3. Letter from John W. Lubinski (NRC) to Michael P. Gallagher (Exelon), "Safety  
Evaluation Report Related To The License Renewal of Limerick Generating  
Station, Units 1 and 2", dated January 10, 2013

In the reference 1 letter, Exelon Generation Company, LLC (Exelon) submitted the License  
Renewal Application (LRA) for the Limerick Generating Station, Units 1 and 2 (LGS). In the  
reference 2 letter, Exelon Generation Company, LLC (Exelon) submitted the first annual  
amendment required by 10 CFR 54.21(b) for LGS. In the reference 3 letter, the U.S. Nuclear  
Regulatory Commission issued the Safety Evaluation Report related to the LGS License  
Renewal Application (LRA).

Enclosure A to this letter provides a summary of the second annual review of the LGS License  
Renewal Application in accordance with 10 CFR 54.21(b). The review identified no changes to  
the current licensing basis (CLB) of LGS that materially affect the contents of the License  
Renewal Application, including the FSAR supplement.

Separate from the annual review, Exelon also performed a review of License Renewal Interim Staff Guidance (ISG). Based on our review of LR-ISG-2011-03, "Generic Aging Lessons Learned (GALL) Report Revision 2 AMP XI.M41, "Buried and Underground Piping and Tanks", changes were identified that required the LGS License Renewal Application to be supplemented as shown within Enclosures B and C.

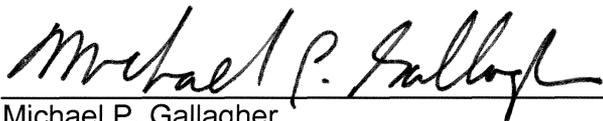
Commitment 29 is modified as show in Enclosure C. There are no other new or revised regulatory commitments contained in this letter.

If you have any questions, please contact Mr. Al Fulvio, Manager, Exelon License Renewal, at 610-765-5936.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 6-17-2013

Respectfully,



Michael P. Gallagher  
Vice President - License Renewal Projects  
Exelon Generation Company, LLC

Enclosures: A: Annual Update Review per 10 CFR 54.21(b) for the Limerick Generating Station License Renewal Application  
B: LGS License Renewal Application Update as a result of License Renewal Interim Staff Guidance Review  
C: LGS License Renewal Application Commitment List Changes as a result of License Renewal Interim Staff Guidance Review

cc: Regional Administrator – NRC Region I  
NRC Project Manager (Safety Review), NRR-DLR  
NRC Project Manager (Environmental Review), NRR-DLR  
NRC Project Manager, NRR- DORL Limerick Generating Station  
NRC Senior Resident Inspector, Limerick Generating Station  
R. R. Janati, Commonwealth of Pennsylvania

## **Enclosure A**

### **Annual Update Review per 10 CFR 54.21(b) for the Limerick Generating Station License Renewal Application**

#### **Introduction**

The License Renewal Rule, 10 CFR 54.21(b), requires that each year following submittal of a License Renewal Application (LRA) and at least 3 months before scheduled completion of the NRC review, an amendment to the renewal application must be submitted that identifies any change to the CLB of the facility that materially affects the contents of the License Renewal Application, including the FSAR supplement. In accordance with this requirement, Exelon Generation Company, LLC (Exelon) has completed the review of the Limerick Generating Station CLB changes since the submittal of the first annual update.

#### **Review Process**

The review period for this process was from the end date of the last annual update review until the end date of this review (May 1, 2012 to April 30, 2013).

The LGS annual update review is a procedurally controlled process to satisfy the requirements of 10 CFR 54.21(b). Specifically, the process is used to identify and evaluate changes to the plant CLB by reviewing plant documents, which include but are not limited to the following:

- Design Change Packages (DCPs)
- UFSAR Updates
- Licensing Correspondence
- Piping & Instrumentation Drawings (P&IDs)/Boundary Drawings
- Generic Safety Issues
- TLAAs

These changes are then reviewed by a technical verification team to determine those changes to the CLB that materially affect the LRA.

#### **Review Results**

The review identified no changes to the CLB of the Limerick Generating Station that materially affect the contents of the LGS License Renewal Application, including the FSAR supplement.

## Enclosure B

### LGS License Renewal Application Updates as a result of License Renewal Interim Staff Guidance Reviews

The NRC has encouraged applicants for license renewal to address proposed Interim Staff Guidance (ISG) issues in license renewal applications. The following is the complete list of ISG issues that have not previously been addressed by Exelon in the LGS License Renewal Application review process.

1. **Generic Aging Lessons Learned (GALL) Report Revision 2 AMP XI.M41, “Buried and Underground Piping and Tanks” (LR-ISG-2011-03)**. The changes to the LGS LRA as a result of Exelon’s review are documented within this enclosure and Enclosure C.
2. **Wall Thinning Due to Erosion Mechanisms (LR-ISG-2012-01)**. This ISG was recently finalized on May 1, 2013 and as such, Exelon has not completed our review. If it is determined that changes to the LGS LRA are warranted based on the results of the completed review, then Exelon will submit a supplement to the LGS LRA.

Note: For clarity, text from the original LRA, as modified through the LRA review process, is shown in normal font. Changes are highlighted with ***bold italics*** for inserted text and strikethroughs for deleted text.

As a result of the review of LR-ISG-2011-03, the Buried and Underground Piping and Tanks aging management program for Section A.2.1.29 of Appendix A, is revised as shown below:

#### **A.2.1.29 Buried and Underground Piping and Tanks**

The Buried and Underground Piping and Tanks aging management program is an existing program that manages the external surface aging effects of loss of material for piping and components in a buried or underground environment. The LGS buried component **program** activities consists of preventive, **mitigative, (i.e., coatings, backfill quality and cathodic protection)** and ~~condition-monitoring measures~~ **inspection activities** to manage, detect and monitor the loss of material due to external corrosion for piping and components within the scope of license renewal that are in a buried or underground environment.

External inspections of buried components will occur opportunistically when they are excavated for any reason.

The Buried and Underground Piping and Tanks aging management program will be enhanced to:

1. If adverse indications are detected during inspection of in-scope buried piping, inspection sample sizes within the affected piping categories are doubled. If adverse indications are found in the expanded sample, **an analysis is conducted to determine the extent of condition and extent of cause. The size of the follow-on inspections will be determined based on the extent of condition and extent of cause.** ~~the inspection sample size is again doubled. This doubling of the inspection sample size continues as necessary.~~
2. Coat the underground Emergency Diesel Generator System fuel oil piping prior to the period of extended operation. The coating will be in accordance with Table 1 of NACE SP0169-2007 or Section 3.4 of NACE RP0285-2002.
3. Perform direct visual inspections and volumetric inspections of the underground Emergency Diesel Generator System fuel oil piping and components during each 10-year period beginning 10 years prior to the entry into the period of extended operation. Prior to the period of extended operation all in scope Emergency Diesel Generator System fuel oil piping and components located in underground vaults will undergo a 100 percent visual inspection. Volumetric inspections will also be performed. After entering the period of extended operation, 2 percent of the linear length of in scope Emergency Diesel Generator System fuel oil piping and components located in underground vaults will undergo direct visual inspections and volumetric inspections every 10 years. Inspection locations after entering the period of extended operation will be selected based on susceptibility to degradation and consequences of failure. Visual inspections will be performed by a NACE **Coating Inspector Program Level 2 or 3** qualified inspector **or an individual that has attended the EPRI Comprehensive Coatings Course and completed the EPRI Buried Pipe Condition Assessment and Repair Training Computer Based Training Course.**
4. Perform two sets of volumetric inspections of the Safety Related Service Water System underground piping and components during each 10-year period beginning 10 years prior to the entry into the period of extended operation. Each set of volumetric

inspections will assess either the entire length of a run of in scope Safety Related Service Water piping and components in the underground vault or a minimum of 10 feet of the linear length of in scope Safety Related Service Water System piping and components in the underground vault. Inspection locations will be selected based on susceptibility to degradation and consequences of failure.

5. Specify that visual inspections of Safety Related Service Water System underground piping and components will be performed by a NACE **Coating Inspector Program Level 2 or 3** qualified inspector **or an individual that has attended the EPRI Comprehensive Coatings Course and completed the EPRI Buried Pipe Condition Assessment and Repair Training Computer Based Training Course.**
6. Perform trending of the cathodic protection testing results to identify changes in the effectiveness of the system and to ensure that the rectifiers **remain operational at least 85% of the time, and cathodic protection effectiveness will be maintained greater than 80%** required to protect in-scope piping are reliable 90 percent of the time.
7. Modify the yearly cathodic protection survey acceptance criterion to meet NACE SP0169-2007 standards and add a statement that if negative polarized potential exceeds -1100mV relative to copper/copper sulfate electrode an issue report will be entered into the corrective action program. **In performing cathodic protection surveys, only the -850mV polarized potential criterion for steel piping will be used for acceptance criteria and determination of cathodic protection system effectiveness, unless the -100mV polarization criterion can be demonstrated effective through use of buried coupons, electrical resistance probes, or placement of reference cells in the immediate vicinity of the piping being measured.**
8. **Whenever pipe is excavated and damage to the coating is significant and the damage was caused by non-conforming backfill, an extent of condition evaluation should be conducted to ensure that the as-left condition of backfill in the vicinity of observed damage will not lead to further degradation.**

These enhancements will be implemented prior to the period of extended operation, with the actions performed in accordance with the schedule described above.

As a result of the review of LR-ISG-2011-03, the Enhancements section of the Buried and Underground Piping and Tanks aging management program for Section B.2.1.29 of Appendix B, is revised as shown below:

### **B.2.1.29 Buried and Underground Piping and Tanks**

#### **Enhancements**

Prior to the period of extended operation, the following enhancements will be implemented in the following program elements:

1. If adverse indications are detected during inspection of in-scope buried piping, inspection sample sizes within the affected piping categories are doubled. If adverse indications are found in the expanded sample, ***an analysis is conducted to determine the extent of condition and extent of cause. The size of the follow-on inspections will be determined based on the extent of condition and extent of cause.*** ~~the inspection sample size is again doubled. This doubling of the inspection sample size continues as necessary.~~ **Program Element Affected: Detection of Aging Effects (Element 4)**
2. Coat the underground Emergency Diesel Generator System fuel oil piping prior to the period of extended operation. The coating will be in accordance with Table 1 of NACE SP0169-2007 or Section 3.4 of NACE RP0285-2002. **Program Elements Affected: Preventative Actions (Element 2), Parameters Monitored or Inspected (Element 3), Detection of Aging Effects (Element 4) and Acceptance Criteria (Element 6)**
3. Perform direct visual inspections and volumetric inspections of the underground Emergency Diesel Generator System fuel oil piping and components during each 10-year period beginning 10 years prior to the entry into the period of extended operation. Prior to the period of extended operation all in scope Emergency Diesel Generator System fuel oil piping and components located in underground vaults will undergo a 100 percent visual inspection. Volumetric inspections will also be performed. After entering the period of extended operation, 2 percent of the linear length of in scope Emergency Diesel Generator System fuel oil piping and components located in underground vaults will undergo direct visual inspections and volumetric inspections every 10 years. Inspection locations after entering the period of extended operation will be selected based on susceptibility to degradation and consequences of failure. Visual inspections will be performed by a NACE ***Coating Inspector Program Level 2 or 3*** qualified inspector ***or an individual that has attended the EPRI Comprehensive Coatings Course and completed the EPRI Buried Pipe Condition Assessment and Repair Training Computer Based Training Course.*** **Program Elements Affected: Parameters Monitored or Inspected (Element 3), Detection of Aging Effects (Element 4) and Acceptance Criteria (Element 6)**
4. Perform two sets of volumetric inspections of the Safety Related Service Water System underground piping and components during each 10-year period beginning 10 years prior to the entry into the period of extended operation. Each set of volumetric inspections will assess either the entire length of a run of in scope Safety Related Service Water piping and components in the underground vault or a minimum

of 10 feet of the linear length of in scope Safety Related Service Water System piping and components in the underground vault. Inspection locations will be selected based on susceptibility to degradation and consequences of failure. **Program Elements Affected: Parameters Monitored or Inspected (Element 3) and Detection of Aging Effects (Element 4)**

5. Specify that visual inspections of Safety Related Service Water System underground piping and components will be performed by a NACE ***Coating Inspector Program Level 2 or 3*** qualified inspector ***or an individual that has attended the EPRI Comprehensive Coatings Course and completed the EPRI Buried Pipe Condition Assessment and Repair Training Computer Based Training Course.*** **Program Elements Affected: Parameters Monitored or Inspected (Element 3) and Detection of Aging Effects (Element 4)**
6. Perform trending of the cathodic protection testing results to identify changes in the effectiveness of the system and to ensure that the rectifiers ***remain operational at least 85% of the time, and cathodic protection effectiveness will be maintained greater than 80%*** required to protect in scope piping are reliable 90 percent of the time. **Program Elements Affected: Preventative Actions (Element 2), Detection of Aging Effects (Element 4) Monitoring, Trending (Element 5) and Acceptance Criteria (Element 6)**
7. Modify the yearly cathodic protection survey acceptance criterion to meet NACE SP0169-2007 standards and add a statement that if negative polarized potential exceeds -1100mV relative to copper/copper sulfate electrode an issue report will be entered into the corrective action program. ***In performing cathodic protection surveys, only the -850mV polarized potential criterion for steel piping will be used for acceptance criteria and determination of cathodic protection system effectiveness, unless the -100mV polarization criterion can be demonstrated effective through use of buried coupons, electrical resistance probes, or placement of reference cells in the immediate vicinity of the piping being measured.*** **Program Elements Affected: Preventative Actions (Element 2), Detection of Aging Effects (Element 4) and Acceptance Criteria (Element 6)**
8. ***Whenever pipe is excavated and damage to the coating is significant and the damage was caused by non-conforming backfill, an extent of condition evaluation should be conducted to ensure that the as-left condition of backfill in the vicinity of observed damage will not lead to further degradation.*** **Program Elements Affected: Acceptance Criteria (Element 6)**

## Enclosure C

### **LGS License Renewal Application Commitment List Changes as a result of License Renewal Interim Staff Guidance Reviews**

This enclosure provides an update to the LGS LRA Appendix A, Section A.5 License Renewal Commitment List, as a result of the review of LR-ISG-2011-03.

Note: For clarity, text from the original LRA, as modified through the LRA review process, is shown in normal font. Changes are highlighted with ***bold italics*** for inserted text and strikethroughs for deleted text.

**A.5 License Renewal Commitment List**

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE
29	Buried and Underground Piping and Tanks	<p>Buried and Underground Piping and Tanks is an existing program that will be enhanced to:</p> <ol style="list-style-type: none"> <li>1. If adverse indications are detected during inspection of in-scope buried piping, inspection sample sizes within the affected piping categories are doubled. If adverse indications are found in the expanded sample, <b><i>an analysis is conducted to determine the extent of condition and extent of cause. The size of the follow-on inspections will be determined based on the extent of condition and extent of cause.</i></b> <del>the inspection sample size is again doubled. This doubling of the inspection sample size continues as necessary</del></li> <li>2. Coat the underground Emergency Diesel Generator System fuel oil piping prior to the period of extended operation. The coating will be in accordance with Table 1 of NACE SP0169-2007 or Section 3.4 of NACE RP0285-2002.</li> <li>3. Perform direct visual inspections and volumetric inspections of the underground Emergency Diesel Generator System fuel oil piping and components during each 10-year period beginning 10 years prior to the entry into the period of extended operation. Prior to the period of extended operation all in scope Emergency Diesel Generator System fuel oil piping and components located in underground vaults will undergo a 100 percent visual inspection. Volumetric inspections will also be performed. After entering the period of extended operation, 2 percent of the linear length of in scope Emergency Diesel Generator System fuel oil piping and components located in underground vaults will undergo direct visual inspections and volumetric inspections every 10 years. Inspection locations after entering the period of extended operation will be selected based on susceptibility to degradation and consequences of failure. Visual inspections will be performed by a NACE <b><i>Coating Inspector Program Level 2 or 3</i></b> qualified inspector <b><i>or an individual that has attended the EPRI Comprehensive Coatings Course and completed the EPRI Buried Pipe Condition Assessment and Repair Training Computer Based Training Course.</i></b></li> <li>4. Perform two sets of volumetric inspections of the Safety Related Service Water System underground piping and components during each 10-year period beginning 10 years prior to the entry into the period of extended operation. Each set of volumetric inspections will assess either the entire length of a run of in scope Safety Related Service Water piping and</li> </ol>	<p>Program to be enhanced prior to the period of extended operation.</p> <p>Inspection schedule identified in commitment.</p>	<p>Section A.2.1.29</p> <p>LGS Letter dated 2/15/12 RAI B.2.1.29-2 RAI B.2.1.29-3</p> <p>LGS Letter dated 3/30/12 RAI B.2.1.29-2.1</p> <p><b><i>LGS Letter dated 6/17/2013 ISG-2011-03</i></b></p>

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE
		<p>components in the underground vault or a minimum of 10 feet of the linear length of in scope Safety Related Service Water System piping and components in the underground vault. Inspection locations will be selected based on susceptibility to degradation and consequences of failure.</p> <p>5. Specify that visual inspections of Safety Related Service Water System underground piping and components will be performed by a NACE <b>Coating Inspector Program Level 2 or 3</b> qualified inspector <b>or an individual that has attended the EPRI Comprehensive Coatings Course and completed the EPRI Buried Pipe Condition Assessment and Repair Training Computer Based Training Course.</b></p> <p>6. Perform trending of the cathodic protection testing results to identify changes in the effectiveness of the system and to ensure that the rectifiers <b>remain operational at least 85% of the time, and cathodic protection effectiveness will be maintained greater than 80%</b> <del>required to protect in scope piping are reliable 90 percent of the time.</del></p> <p>7. Modify the yearly cathodic protection survey acceptance criterion to meet NACE SP0169-2007 standards and add a statement that if negative polarized potential exceeds -1100mV relative to copper/copper sulfate electrode an issue report will be entered into the corrective action program. <b>In performing cathodic protection surveys, only the -850mV polarized potential criterion for steel piping will be used for acceptance criteria and determination of cathodic protection system effectiveness, unless the -100mV polarization criterion can be demonstrated effective through use of buried coupons, electrical resistance probes, or placement of reference cells in the immediate vicinity of the piping being measured.</b></p> <p>8. <b>Whenever pipe is excavated and damage to the coating is significant and the damage was caused by non-conforming backfill, an extent of condition evaluation should be conducted to ensure that the as-left condition of backfill in the vicinity of observed damage will not lead to further degradation.</b></p>		