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10 CFR 50
10 CFR 51
10 CFR 54

June 22, 2012

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: Response to NRC Request for Additional Information, dated June 21, 2012, related to the Limerick Generating Station License Renewal Application
- Reference: 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. Letter from Robert F. Kuntz (NRC) to Michael P. Gallagher (Exelon), "Requests for Additional Information for the review of the Limerick Generating Station, Units 1 and 2, License Renewal Application (TAC Nos. ME6555, ME6556)", dated June 21, 2012

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, the NRC requested additional information to support the staffs' review of the LRA.

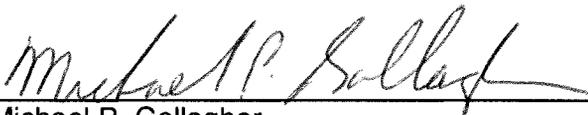
Enclosed is the response to this request for additional information.

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 06-22-2012

Respectfully,



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

Enclosures: A: Responses to Requests for Additional Information
B: Updates to affected LGS LRA sections
C: LGS License Renewal Commitment List Changes

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

**Response to Request for Additional Information related to various sections of the LGS
License Renewal Application (LRA)**

RAI B.2.1.12-3

RAI B.2.1.12-3

Background

Commitment No. 12 and LRA Section A.2.1.12 were revised as a result of the responses to RAI B.2.1.12-1 and RAI B.2.1.12-2. The revision includes a commitment to, “[p]erform periodic inspections for loss of material in the Nonsafety-Related Service Water System at a minimum of five locations on each unit once every refueling cycle.” The response to RAI B.2.1.12-1 also provided the basis for why the opportunistic inspections of buried service water piping would be sufficient to provide adequate managing of the aging of the internal surfaces of the piping.

Issue

The staff agrees that (a) the opportunistic inspection of the buried piping was clarified to at least occur during the replacement of the residual heat removal service water (RHRSW) piping in the pipe tunnel between 2012 and 2015, (b) the detailed inspections of the piping removed during the replacement will provide supplemental information to assess the condition of the buried piping, and (c) degradation of the piping in aboveground portions of the system will be consistent with the buried piping given similar operating conditions. However, given the timing of the only certain inspection of the buried service water piping, the staff does not agree that there is a sufficient basis to establish a reasonable assurance that the buried service water piping will perform its current licensing basis function(s) throughout the period of extended operation. Nevertheless, the staff believes that the five inspections per unit per refueling outage interval in the nonsafety-related portions of the service water system, given similar operating conditions, would provide sufficient timely data to understand the condition of the internal surfaces of the buried piping.

The Updated Final Safety Analysis Report (UFSAR) supplement, as amended, does not provide a link between the inspections of the nonsafety-related portions of the service water system and the conditions of the buried piping. Lacking this link, the staff does not believe that the UFSAR supplement provides a sufficient summary description of the activities for managing the aging of the buried service water piping as required by 10 CFR 54.21(d).

Request

- (a) Revise LRA Section A.2.1.12 to establish that the nonsafety-related piping inspections are necessary to provide a sufficient understanding of the buried service water piping conditions throughout the period of extended operation.
- (b) State how inspection locations will be selected to ensure that conditions are similar between the nonsafety-related piping inspections and buried service water piping (e.g., flow, temperature) such as they impact MIC.

Alternatively,

- (c) Revise Commitment No. 12 and LRA Section A.2.1.12 to conduct internal visual and/or volumetric inspections of other portions of the service water system that would be sufficient to provide timely data to understand the condition of the internal surfaces of the buried piping throughout the period of extended operation.

Exelon Response

Inspections performed on the non-buried piping in the Safety Related Service Water System are intended to establish reasonable assurance that the buried Safety Related Service Water piping will perform its current licensing basis function(s) throughout the period of extended operation. Accordingly, consistent with Request (c), locations will be selected to conduct periodic volumetric inspections of the non-buried Safety Related Service Water System piping that are representative of the conditions (e. g. flow, temperature) in the buried portions of the safety-related piping.

LRA Section A.2.1.12 and Section B.2.1.12 are revised as shown in Enclosure B to include a minimum of ten locations in the non-buried Safety Related Service Water System piping that will be inspected every two years. LRA Table A.5 Commitment 12 is also revised as shown in Enclosure C.

A response to Request (a) and Request (b) is not necessary because Exelon is committing to use inspection results from safety-related piping and not the nonsafety-related piping inspections to understand the condition of the internal surfaces of the buried safety-related piping throughout the period of extended operation.

Enclosure B
LGS License Renewal Application Updates

Notes:

- To facilitate understanding, portions of the original LRA have been repeated in this Enclosure, with revisions indicated.
- Existing LRA text is shown in normal font. Changes are highlighted with ***bold italics*** for inserted text and strikethroughs for deleted text.

As a result of the response to RAI B.2.1.12-3 provided in Enclosure A of this letter, the UFSAR supplement for the Open-Cycle Cooling Water program, Section A.2.1.12 of the LRA, is revised as shown below:

A.2.1.12 Open-Cycle Cooling Water System

The Open-Cycle Cooling Water System (OCCWS) aging management program is an existing program that manages heat exchangers, piping, piping elements and piping components in safety-related and nonsafety-related raw water systems that are exposed to raw water and air/gas-wetted environments for loss of material, reduction of heat transfer, and hardening and loss of strength of elastomers. This is accomplished through tests and inspections per the guidelines of NRC Generic Letter 89-13. System and component testing, visual inspections, non-destructive examination (i. e. Radiographic Testing, Ultrasonic Testing and Eddy Current Testing), and chemical injection are conducted to ensure that aging effects are managed such that system and component intended functions and integrity are maintained.

The OCCWS includes those systems that transfer heat from safety-related structures, systems and components to the ultimate heat sink as defined in GL 89-13 as well as those raw water systems which are in scope for license renewal for spatial interaction but have no safety-related heat transfer function. Periodic heat transfer testing or inspection and cleaning of heat exchangers with a heat transfer intended function is performed in accordance with LGS commitments to GL 89-13 to verify heat transfer capabilities. Heat exchangers which have no safety-related heat transfer function are periodically inspected and cleaned.

Periodic volumetric inspections will be performed in the non-buried portions of the Safety Related Service Water System to provide a sufficient understanding of the buried service water piping conditions throughout the period of extended operation. The inspection locations are selected to ensure that conditions are similar (e. g. flow, temperature) to those in the buried portions of the Safety Related Service Water System piping.

The Open-Cycle Cooling Water System aging management program will be enhanced to:

1. Perform internal inspection of buried Safety Related Service Water Piping when it is accessible during maintenance and repair activities
2. Perform periodic inspections for loss of material in the Nonsafety-Related Service Water System at a minimum of five locations on each unit once every refueling cycle.
3. Replace the supply and return piping for the Core Spray pump compartment unit coolers.
4. Replace degraded RHRSW piping in the pipe tunnel.
5. ***Perform periodic inspections for loss of material in the Safety Related Service Water System at a minimum of ten locations every two years.***

The enhancements will be implemented prior to the period of extended operation.

As a result of the response to RAI B.2.1.12-3 provided in Enclosure A of this letter, Section B.2.1.12 of the LRA is revised as shown below:

B.2.1.12 Open-Cycle Cooling Water System

Program Description

The Open-Cycle Cooling Water System (OCCWS) aging management program is an existing program that includes mitigative, preventive, performance monitoring, and condition monitoring activities to manage heat exchangers, piping, piping elements, and piping components in safety-related and nonsafety-related raw water systems that are exposed to a raw water or air/gas wetted environment for loss of material, reduction of heat transfer, and hardening and loss of strength of elastomers. The activities for this program are consistent with the LGS commitments to the requirements of GL 89-13 and provide for management of aging effects in raw water cooling systems through tests, inspections and component cleaning. System and component testing, visual inspections, non-destructive examination (i. e. Radiographic Testing, Ultrasonic Testing, and Eddy Current Testing), and biocide and chemical treatment are conducted to ensure that aging effects are managed such that system and component intended functions and integrity are maintained.

The OCCWS includes those systems that transfer heat from safety-related systems and components to the ultimate heat sink as defined in GL 89-13 as well as those raw water systems which are in scope for license renewal for spatial interaction but have no safety-related heat transfer function.

The guidelines of GL 89-13 are utilized for the surveillance and control of biofouling for the OCCWS. Procedures provide instructions and controls for chemical and biocide injection. Periodic inspections are performed for the presence of mollusks and biocide treatments are applied as necessary.

Periodic heat transfer testing or inspection and cleaning of heat exchangers with a heat transfer intended function is performed in accordance with LGS commitments to GL 89-13 to verify heat transfer capabilities. Periodic inspection and cleaning is performed on the heat exchangers without a heat transfer intended function.

Routine inspections and maintenance ensure that corrosion, erosion, sediment deposition and biofouling cannot degrade the performance of safety-related systems serviced by OCCWS. No credit is taken for protective coatings on safety-related components in the OCCWS. Protective coatings on the Circulating Water System piping are periodically inspected and repaired. The In-service Inspection (ISI) program provides for periodic leakage detection of buried piping and components as well as inspection of aboveground piping and components.

Examination of polymeric materials in systems serviced by OCCWS will be consistent with examinations described in the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B.2.1.26) program.

System walkdowns are performed periodically to assess the material condition

of OCCWS piping and components. Compliance with the licensing basis is ensured by review of system design basis documents as well as periodic performance of focused area self-assessments and safety system functional inspections.

Periodic volumetric inspections will be performed in the non-buried portions of the Safety Related Service Water System to provide a sufficient understanding of the buried service water piping conditions throughout the period of extended operation. The inspection locations are selected to ensure that conditions are similar (e. g. flow, temperature) to those in the buried portions of the Safety Related Service Water System piping.

Enhancements to the program, including internal inspections of buried pipe and periodic inspection of the Nonsafety-Related Service Water System piping will be implemented prior to entering the period of extended operation.

NUREG-1801 Consistency

The Open-Cycle Cooling Water System aging management program will be consistent with the ten elements of aging management program XI.M20, "Open-Cycle Cooling Water System," specified in NUREG-1801.

Exceptions to NUREG-1801

None.

Enhancements

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

1. Perform internal inspection of buried Safety Related Service Water Piping when it is accessible during maintenance and repair activities. **Program Elements Affected: Parameters Monitored/Inspected (Element 3), Detection of Aging Effects (Element 4)**
2. Perform periodic inspections for loss of material in the Nonsafety-Related Service Water System at a minimum of five locations on each unit once every refueling cycle. **Program Elements Affected: Parameters Monitored/Inspected (Element 3), Detection of Aging Effects (Element 4)**
3. Replace the supply and return piping for the Core Spray pump compartment unit coolers. **Program Elements Affected: Preventive Actions (Element 2)**
4. Replace degraded RHRSW piping in the pipe tunnel. **Program Elements Affected: Preventive Actions (Element 2)**
5. ***Perform periodic inspections for loss of material in the Safety Related Service Water System at a minimum of ten locations every two years. Program Elements Affected: Parameters Monitored/Inspected (Element 3), Detection of Aging Effects (Element 4)***

Enclosure C

LGS License Renewal Commitment List Changes

This Enclosure includes an update to the LGS LRA Appendix A, Section A.5 License Renewal Commitment List, as a result of the Exelon response to RAI:

RAI B.2.1.12-3

Note: For clarity, portions of the original LRA License Renewal Commitment List text are repeated in this Enclosure. Added text is shown in ***Bold Italics***.

As a result of the responses to RAI B.2.1.12-3 provided in Enclosure A of this letter, Table A.5 of the LRA is revised as shown below:

A.5 License Renewal Commitment List

NO.	PROGRAM OR TOPIC	COMMITMENT	IMPLEMENTATION SCHEDULE	SOURCE
12	Open-Cycle Cooling Water System	<p>Open-Cycle Cooling Water System is an existing program that will be enhanced to:</p> <ol style="list-style-type: none"> 1. Perform internal inspection of buried Safety Related Service Water Piping when it is accessible during maintenance and repair activities. 2. Perform periodic inspections for loss of material in the Nonsafety-Related Service Water System at a minimum of five locations on each unit once every refueling cycle. 3. Replace the supply and return piping for the Core Spray pump compartment unit coolers. 4. Replace degraded RHRSW piping in the pipe tunnel. 5. <i>Perform periodic inspections for loss of material in the Safety Related Service Water System at a minimum of ten locations every two years.</i> 	<p>Program to be enhanced prior to the period of extended operation.</p> <p>Inspection schedule identified in commitment.</p>	<p>Section A.2.1.12</p> <p>LGS letter dated 2/15/12 RAI B.2.1.12-1 RAI B.2.2.12-2</p> <p>LGS letter dated 6/22/12 RAI B.2.1.12-3</p>