LimerickNPEm Resource

From: Milano, Patrick
Sent: Friday, August 31, 2012 2:06 PM
To: Christopher.Wilson2@exeloncorp.com
Cc: LimerickHearingFile Resource
Subject: Limerick ACRS SC Slides - Revised Draft
Attachments: Limerick ACRS SC Mtg 09-05-12 R5.pdf

This is the latest version of the draft presentation.

Hearing Identifier: Limerick_LR_NonPublic
Email Number: 1516

Mail Envelope Properties (9C2386A0C0BC584684916F7A0482B6CA8EFB453771)

Subject: Limerick ACRS SC Slides - Revised Draft
Sent Date: 8/31/2012 2:06:17 PM
Received Date: 8/31/2012 2:06:20 PM
From: Milano, Patrick

Created By: Patrick.Milano@nrc.gov

Recipients:
"LimerickHearingFile Resource" <LimerickHearingFile.Resource@nrc.gov>
Tracking Status: None
"Christopher.Wilson2@exeloncorp.com" <Christopher.Wilson2@exeloncorp.com>
Tracking Status: None

Post Office: HQCLSTR02.nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	55	8/31/2012 2:06:20 PM
Limerick ACRS SC Mtg 09-05-12 R5.pdf	212371	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

United States Nuclear Regulatory Commission

Protecting People and the Environment

Advisory Committee on Reactor Safeguards
License Renewal Subcommittee

Safety Evaluation Report (SER) with Open Items
Limerick Generating Station, Units 1 and 2

Issued: July 31, 2012

United States Nuclear Regulatory Commission

Protecting People and the Environment

Safety Evaluation Report (SER) with Open Items

Limerick Generating Station, Units 1 and 2

September 5, 2012

Patrick Milano, Sr. Project Manager
Office of Nuclear Reactor Regulation

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Presentation Outline

- Overview of Limerick license renewal review
- SER Section 2, Scoping and Screening review
- Region I License Renewal Onsite Inspection
- SER Section 3, Aging Management Programs and Aging Management Review Results
- SER Section 4, Time-Limited Aging Analyses

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Facility Facts

- **License Renewal Application (LRA) submitted June 22, 2011**
  - Applicant: Exelon Generation Company, LLC (Exelon)
  - Facility Operating License Nos. NPF-39 and NPF-85
  - Docket Nos. 50-352 and 50-353
  - Current License Expiration Dates: October 26, 2024, and June 22, 2029
  - Requested renewal period of 20 years beyond the current license dates
- **Approximately 21 miles northwest of Philadelphia, PA**
- **BWRs (GE 4) with Mark II containment design**

Audits and Inspections

- Scoping and Screening Methodology Audit
  - September 19-23, 2011(report December 9, 2011)
- Aging Management Program (AMP) Audit
  - October 3-14, 2011 (report February 28, 2012)
- Region I Inspection (Scoping and Screening & AMPs)
  - June 4-21, 2012 (report July 30, 2012)
- Environmental Review Audit
  - November 7-10, 2011

Overview (SER)

- Safety Evaluation Report (SER) with Open Items issued July 31, 2012
- SER contains 2 Open Items (OIs):
  - Suppression Pool Liner and Downcomer Corrosion
  - Operating Experience
- Final SER is tentatively expected to be completed in January 2013

SER Section 2 Summary

Structures and Components Subject to Aging Management Review

- Section 2.1, Scoping and Screening Methodology
- Section 2.2, Plant-Level Scoping Results
- Sections 2.3, 2.4, 2.5 Scoping and Screening Results

Regional Inspections

Overview

- Six inspectors over three weeks
- 10 CFR 54.4(a)(2) inspection
- 32 of 45 Aging Management Programs Reviewed

Regional Inspections

Walk-downs

- Systems in the Units 1 and 2 Reactor Enclosures
- Systems in the Units 1 and 2 Turbine Enclosures
- Essential Service Water pipe tunnel
- 2A Emergency Diesel Generator Room
- Battery Rooms
- Refueling Floor
- Control Room
- Unit 1 and 2 Spray Pond Structure
- Compressed Air System
- Turbine Building, Containment Building, Diesel Generator Building, and Intake Structures
- Metal Enclosed Buses

Inspection Conclusions

- Scoping of non-safety SSCs and application of the AMPs to those SSCs were acceptable.
- Inspection results support a conclusion that reasonable assurance exists that aging effects will be managed and intended functions maintained

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Regional Inspections

All Region I Plants Inspected for Renewal

• Calvert Cliffs	June 1998
• Peach Bottom	May 2002
• Ginna	June 2003
• Millstone	July 2004
• Nine Mile	February 2005
• Oyster Creek	March 2006
• Pilgrim	September 2006
• Vermont Yankee	February 2007
• Fitzpatrick	April 2007
• Indian Point	January 2008
• Beaver Valley	June 2008
• Susquehanna	August 2008
• Three Mile Island	December 2008
• Salem Hope Creek	June 2010
• Seabrook	April 2011
• Limerick	June 2012

Section 3: Aging Management Review

- Section 3.0 – Use of the GALL Report
- Section 3.1 – Reactor Vessel & Internals
- Section 3.2 – Engineered Safety Features
- Section 3.3 – Auxiliary Systems
- Section 3.4 – Steam and Power Conversion System
- Section 3.5 – Containments, Structures and Component Supports
- Section 3.6 – Electrical and Instrumentation and Controls System

SER Section 3

- 3.0.3 – Aging Management Programs
  - 45 Aging Management Programs (AMPs) presented by applicant and evaluated in the SER
  - No plant-specific AMPs

SER Section 3 Open Items

- **Open Item 3.0.3.2.13-1 ASME Section XI, Subsection IWE**
- Corrosion in suppression pool carbon steel liner
  - General corrosion of liner up to 35 mils in depth, and affecting up to 72% of surface area in some liner panels
  - Pitting up to 122 mils deep
  - Method for augmented inspection to measure loss of liner material
- Degradation of liner coating
  - Existing coating is inorganic zinc material, 6-8 mils thick
  - Adequacy of criteria for selecting locations for recoating
  - Effective identification of degradation in liner plates underwater
- Identification of acceptance criterion for downcomer corrosion

Open Item 3.0.3.2.13-1

Proposed Enhancement to IWE AMP
Concerning Suppression Pool Liner Plate Degradation

- Remove any accumulated sludge in suppression pool every refueling outage
- Examine submerged portion of suppression pool every ISI period
- Use results of examination to implement coating maintenance plan
  - Perform local recoating of areas with general corrosion that exhibit greater than 25 mils loss in plate thickness
  - Perform spot recoating of pitting greater than 50 mils deep
  - Recoat plates with greater than 25 percent coating depletion
- Coating Maintenance Plan will be implemented for the selected areas in a phased approach starting in 2012

Open Item 3.0.3.2.13-1

- Corrosion of liner
  - Pitting corrosion rates are much higher than general corrosion, are unpredictable, and could result in a leak in liner over time
  - Use of depth gage under water to measure pitting with extensive general corrosion present
  - Effective technique to measure remaining thickness of liner plates
- Coating Degradation
  - Managing aging effects due to corrosion and pitting by phased approach of selective recoating of corroded liner areas
  - Underwater liner plate coating beyond its service life
  - Basis for using 25% loss of coated area to classify affected area requiring augmented inspection

SER Section 3 Open Items

SER Section 3.0.5 — Operating Experience for Aging Management Programs (OI 3.0.5-1)

- Applicant identified several areas where enhancements to operating experience review activities are necessary
- Applicant plans to implement these enhancements within two years of receipt of the renewed operating licenses
- Given this schedule, it is not clear whether operating experience related to aging management and age-related degradation will be adequately considered in the period between issuance of the renewed licenses and implementation of the enhancements

SER Section 4: TLAA

- 4.1 Introduction
- 4.2 Reactor Vessel Neutron Embrittlement
- 4.3 Metal Fatigue Analysis
- 4.4 Environmental Qualification of Electrical Equipment
- 4.5 Concrete Containment Tendon Prestress Analysis
- 4.6 Containment Liner Plate, Metal Containments, and Penetrations Fatigue Analysis
- 4.7 Other Plant-Specific TLAAs

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Conclusion

On the basis of its review and pending satisfactory resolution of the open items, the staff will be able to determine that the requirements of 10 CFR 54.29(a) have been met for the license renewal of Limerick Generating Station