



Pilgrim Nuclear Power Station License Renewal Safety Evaluation Report

Staff Presentation to the ACRS

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Office of Nuclear Reactor Regulation

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Introduction



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- Overview
 - Section 2: Scoping and Screening Review
 - License Renewal Inspections
 - Section 3: Aging Management Review Results
 - Section 4: Time-Limited Aging Analyses (TLAAs)

Overview



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- LRA Submitted by Letter, January 27, 2006
 - GE BWR3 - MARK 1 Containment
 - 2028 MWth, 690 MWe
 - Op License DPR-35 Expires June 8, 2012
 - Located in Plymouth, MA

Overview



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- SER Issued June 28, 2007
 - SSER to be Issued September, 2007
 - Open Items (4) Have Been Closed
 - Four (4) License Conditions
 - 92 RAIs Issued, 329 Audit Questions
 - ≈82% Consistent With GALL Report, Revision 1

Review Highlights



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- **AMP GALL Audit**
 - May 22, 2006
 - **Scoping and Screening Methodology Audit**
 - June 6 - June 9, 2006
 - **AMR GALL Audit**
 - June 19, 2006
 - **AMP/AMR Status Briefing**
 - July 17 - 19, 2006
 - **Regional Inspections**
 - September 18 - 22, 2006
 - October 2 - 6, 2006
 - December 6 - 7, 2006

Section 2: Scoping and Screening Review



Section 2.1 - Scoping and Screening Methodology

- On-site Audit - June 6 – June 9, 2006
- Pilgrim included all system components in scope if any components were (a)2 – exceptions stated

Section 2.3

- 4 Additional Components Brought Into Scope

Section 2.2, 2.4, 2.5

- No Omissions

Section 2: Scoping and Screening Review



Section 2.3 – Mechanical Systems

- Open Item 2.3.3.6: Security Diesel
 - LRA Did not Include System Drawings
 - Referred to Regional Inspector to Determine System Components in Scope
 - Staff Considered the 3/9/2007 Inspector Input Adequate to Close the Open Item

Section 2: Scoping and Screening Summary



- The Applicant's Scoping Methodology Meets The Requirements Of 10 CFR Part 54.4
- Scoping And Screening Results, As Amended, Included All SSCs Within The Scope Of License Renewal And Subject To AMR



License Renewal Inspections

Glenn Meyer

Region I

Scoping and Screening



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- 54.4(a)(2) - Non-safety SSCs Whose Failure Could Impact Safety SSCs
 - Spatial and Structural Interactions
 - LRA Drawings and Procedures Reviewed
 - Plant Walkdowns Performed

Scoping and Screening Conclusions



- Spatial Interaction - Acceptable
- Structural Interaction – Corrected
- Scoping and Screening Acceptable for License Renewal

Aging Management



- Reviewed 26 AMP Programs
- Reviewed Programs, Evaluations, and Records
 - Program Procedures
 - Operational Experience Information
 - Prior Pilgrim Issues
- Performed Plant Walk Downs
- Interviewed Cognizant Personnel

Inspection Conclusions



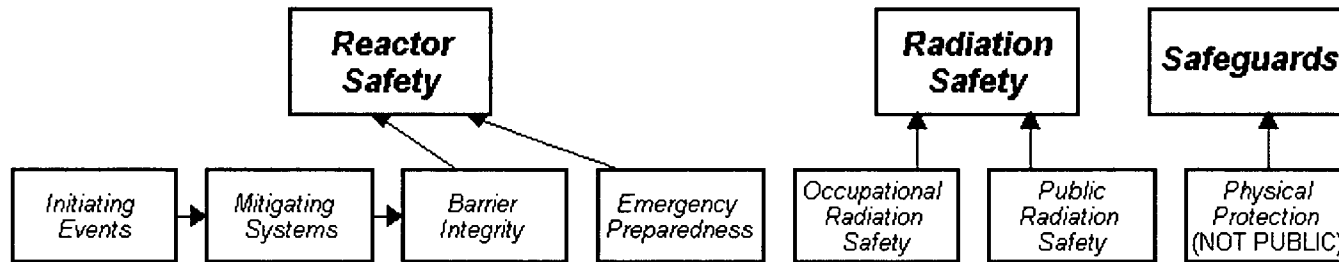
- Scoping and Aging Management Programs Support Conclusion That Aging Effects will be Managed
- Drywell Shell Monitoring

Current Performance

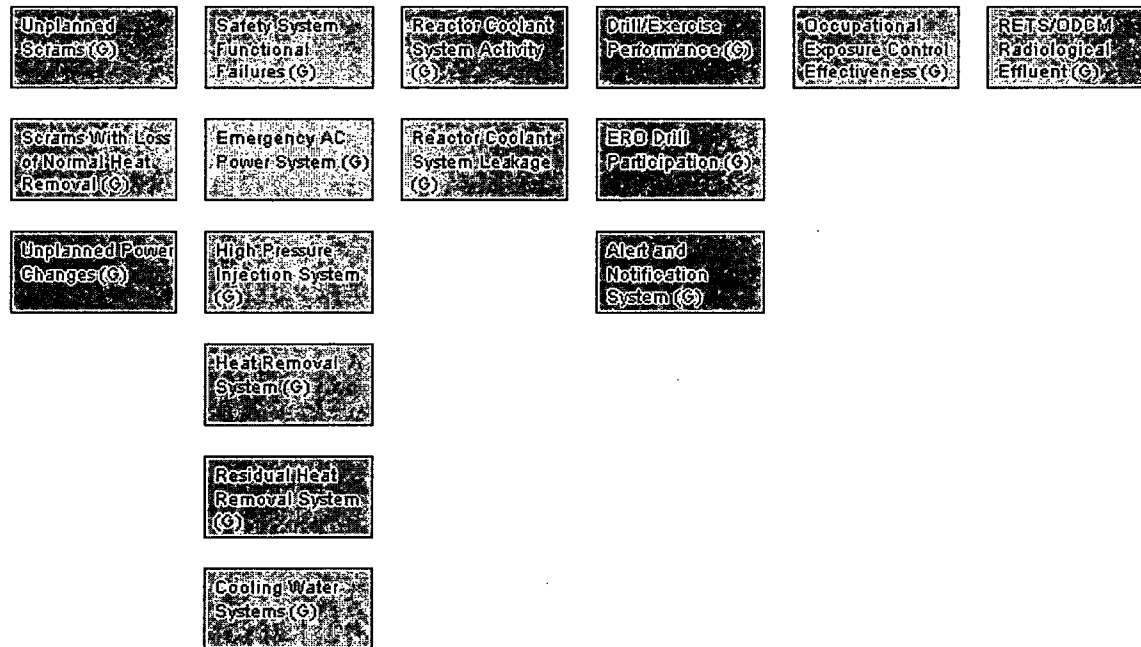


- Licensee Response Column (Column I) of the NRC's Action Matrix – Green PIs and Findings
- No Cross-cutting Issues
- Reactor Oversight Process Baseline Inspections

Performance Indicators

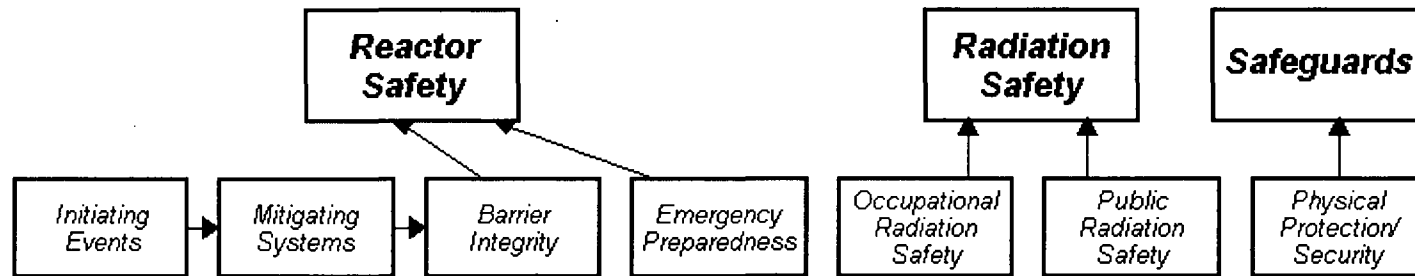


Performance Indicators





Inspection Findings



Most Significant Inspection Findings

| Quarter | Initiating Events | Mitigating Systems | Barrier Integrity | Emergency Preparedness | Occupational Radiation Safety | Public Radiation Safety |
|---------|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------|--------------------------|
| 2Q/2007 | No findings this quarter | No findings this quarter | No findings this quarter | No findings this quarter | No findings this quarter | No findings this quarter |
| 1Q/2007 | No findings this quarter | G | No findings this quarter | No findings this quarter | No findings this quarter | No findings this quarter |
| 4Q/2006 | No findings this quarter | G | No findings this quarter | No findings this quarter | No findings this quarter | No findings this quarter |
| 3Q/2006 | No findings this quarter | No findings this quarter | No findings this quarter | No findings this quarter | No findings this quarter | No findings this quarter |

Miscellaneous findings



Pilgrim Nuclear Power Station
Aging Management Review
Time Limited Aging Analysis
Open Items

Fire Protection Program (B.1.13.1)



- Open Item 3.0.3.2.10:
 - Applicant did not Adequately Address how to Manage the Aging Effects of Inaccessible Seals.
 - Applicant Stated (ACRS) and Documented (June 2007) That There are Actually No Inaccessible Seals at PNPS

Containment Inservice Inspection Program (B.1.16.1)



- Open Item 3.0.3.3.2:
 - Regional Inspection Documented:
 - Inoperative Bellows Rupture Drain Flow Switch
 - Drain Monitoring Inconclusive & Undocumented
 - Water on Torus Room Floor

Containment Inservice Inspection Program (B.1.16.1)



- Open Item 3.0.3.3.2:
 - Replace Switches Now and in 15 years
 - Identified Non-Aggressive Groundwater as Source of Water on Torus Room Floor
 - Tested November 2006 and June 2006
 - Provided Documentation of Drain Monitoring
 - Committed to Obtain Drywell UT Data

Containment Inservice Inspection Program (B.1.16.1)



- Open Item 3.0.3.3.2:
 - Torus Structure
 - Provided Evaluation of Effect on Torus Basemat
 - Commitments to Evaluate Groundwater/Torus Water
 - Commitment to Inspect Condition of Torus Hold Down Bolts and Grout

Section 4.2: Reactor Vessel Neutron Embrittlement



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- Six TLAAAs Affected by Neutron Fluence
 - Reactor Vessel Fluence
 - Pressure-Temperature Limits
 - Upper Shelf Energy
 - Adjusted Reference Temperature
 - Circumferential Weld Inspection Relief
 - Axial Weld Failure Probability

Section 4.2: Reactor Vessel Neutron Embrittlement



- Open Item 4.2
 - Pilgrim – The First BWR-3 to Use RAMA Methodology to Calculate Neutron Fluence
 - Dosimetry Data was not Available with Which to Benchmark the RAMA Calculated Results
 - Result - Fluence Calculation Not Acceptable Per Reg Guide 1.190

Section 4.2: Reactor Vessel Neutron Embrittlement



- Open Item 4.2
 - Applicant's Back Calculation of Limiting Fluence Values Considered Acceptable by the Staff
 - TLAA Identified Which Established the Limiting Fluence Value
 - Axial Welds @ RV Inner Surface - 3.37×10^{18} n/cm² (E > 1.0 MeV)

Section 4.2: Reactor Vessel Neutron Embrittlement



- Open Item 4.2

- License Condition 4.2.6: On or before June 8, 2010, the applicant (Entergy) will submit to the NRC correctly benchmarked RV neutron fluence calculations, consistent with RG 1.190, that will confirm that the neutron fluence for the lower intermediate shell axial welds, at the inner surface of the RV, will not reach the limiting value of 3.37×10^{18} n/cm² (E > 1.0 MeV) by the end of the period of extended operation (54 EFPY).

Section 4.2: Reactor Vessel Neutron Embrittlement



- Open Item 4.2
 - Commitment 47: Submit to the NRC An Action Plan for Benchmarking the Reactor Pressure Vessel Fluence Evaluation.
 - Entergy Plan Submitted August 23, 2007.

Section 4.3: Metal Fatigue



- Reactor Water Environment
 - Removed Exception to Fatigue Monitoring Program regarding Environmentally Assisted Fatigue.
 - Combined FMP and EAF – FMP is Now Consistent with GALL.

Conclusions



- On the basis of its review of the LRA, with the closing of Open Items 2.3.3.6, 3.0.3.2.10, 3.0.3.3.2 and 4.2, the staff determines that the requirements of 10 CFR 54.29(a) have been met.



Questions