

## AGENDA

### Meeting between the U.S. Nuclear Regulatory Commission (NRC) Staff and the Nuclear Energy Institute (NEI) to Discuss Current License Renewal Topics

September 20, 2012

1-4:30 p.m. EDT

**NRC Headquarters  
One White Flint North  
Commissioners Hearing Room**

Agenda Item	Lead	Duration
1. Introduction and Opening Remarks	NRC	15 min.
2. Waste Confidence Rule	NRC	15 min.
3. NRC and the International Atomic Energy Agency and the International Generic Aging Lessons Learned	NRC	15 min.
4. Upcoming Issuance of Information Notice "License Renewal Post-Approval Site Inspection Issues"	NRC	10 min.
5. Status of ISGs	NRC	10 min.
6. Considerations for Subsequent License Renewal	NRC	25 min
Break		10 min
7. Industry use of Operating Experience	NEI	40 min.
8. Aging Management Program Technical Assessment for Subsequent License Renewal	NEI	40 min.
9. New Topics	NRC/NEI	5 min.
10. Action Items	NRC/NEI	5 mins
11. Public Participation and Adjourn	All	5 min.
Meeting Duration		3 hour 15 min. +

# Meeting Between the U.S. Nuclear Regulatory Commission Staff and the Nuclear Energy Institute to Discuss Current License Renewal Topics

September 20, 2012



# Waste Confidence Update

September 20, 2012

Drew Stuyvenberg

# Background

- June 8, 2012 – DC Circuit vacated NRC’s 2010 Waste Confidence and Temporary Storage Rule Update.
- Vacatur on NEPA Grounds
  - Failure to consider unavailability of a repository
  - Failure to consider effects of fuel-pool fires
  - Failure to consider effects of fuel-pool leakage

# Commission Response

- CLI-12-16 (August 7)
  - Holds Waste Confidence contentions in abeyance in individual proceedings.
  - States that license issuance will not occur until the court's remand is addressed.
  - States that reviews will continue, short of license issuance.

# Commission Response, Cont.

- SRM-COMSECY-12-0016 (September 6)
  - Instructs staff to develop and issue a new Waste Confidence Decision and Temporary Storage rule within 24 months.
  - Calls for staff to develop an EIS to support the rulemaking.
  - Calls on staff to refrain from site-specific review of waste-confidence issues except in rare circumstances and with Commission notification.

# Staff Response

- **NMSS has launched a Waste Confidence Directorate**
  - The Directorate is currently staffing up.
  - The Directorate will manage waste-confidence rulemaking and EIS.
- **Staff intends to continue ongoing review activities during the rulemaking**
  - Per Commission instruction (CLI-12-16), NRC will not issue licenses until Waste Confidence has been addressed.

# Implications for License Renewal

- Ongoing reviews will continue.
- Staff plans to publish documents.
- Staff plans to continue contested hearings as scheduled.
- No renewed licenses will be issued until NRC promulgates a final Waste Confidence Decision and Temporary Storage Rule.



# Electronic Resources

- **Commission Press Release:**  
<http://pbadupws.nrc.gov/docs/ML1225/ML12250A653.pdf>
- **Staff Paper, SRM, Commission Votes:**  
<http://www.nrc.gov/reading-rm/doc-collections/commission/comm-secy/2012/>



**U.S.NRC**

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

## **IAEA Program for International GALL (IGALL)**

Allen Hiser, Jr.

Division of License Renewal

NEI/NRC Quarterly Meeting  
September 20, 2012

## Background

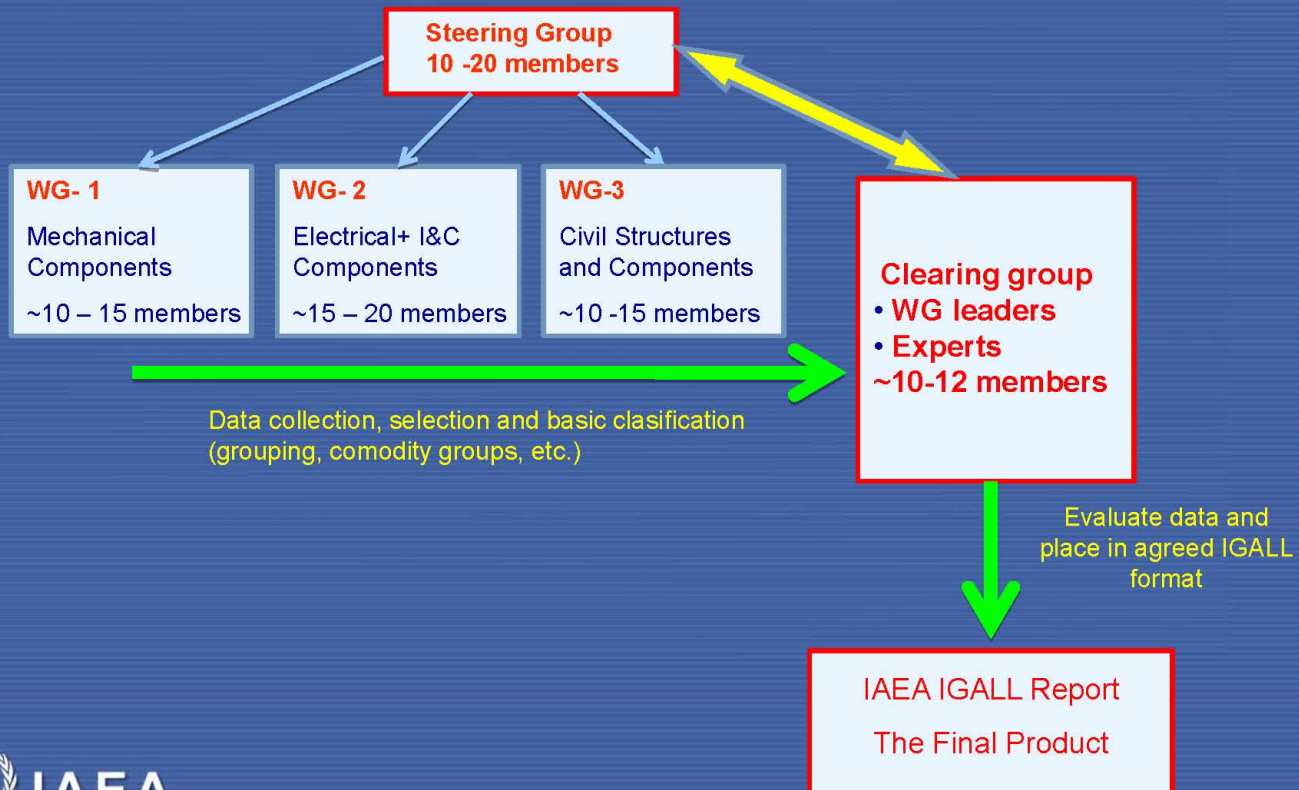
- IAEA meetings advocated IGALL
  - Technical meeting in May 2009
  - Conference on Operational Safety (June 2010)
- Program initiated in September 2010
- Provides framework on aging management for use by all countries

## International Generic Ageing Lessons Learned, Programme

- Development of a **state-of-the-art International Generic Ageing Lessons Learned (IGALL) Report**, as guidance on recommendable ageing management programmes.
- Ground for implementation of **recommendable AMPs** for NPPs with **diverse technologies**: PWR(VVER), BWR, CANDU, PHWR, etc.
- Fundamental document in **supporting a systematic approach to managing ageing** of a variety of structures or components as described in the Safety Guide NS-G-2.12.
- IGALL should establish a **model for a common ground of discussion between regulators and utilities** regarding acceptable ageing management programmes
- The IGALL report will **be updated periodically at least every 5 years**. Perceived as a **“living document”**.

## International Generic Ageing Lessons Learned Report (IGALL)

### EBP IGALL organization



## **NRC Participation**

- Chairman of Steering Group
- Member of Clearing Group
- Chairman of Working Group 1
  - Mechanical Components
- Co-chairman of Working Group 2
  - Electrical and I&C Components
- Co-chairman of Working Group 3
  - Civil Structures and Components

## Process to Develop IGALL

- IGALL starts with GALL (Rev. 2)
  - Aging management review (AMR) tables
  - Aging management programs (AMPs)
  - Time-limited aging analyses
- IGALL development activities
  - Add AMR table information from other member states – reduce inputs to a single entry for IGALL report
  - Add international references

## Differences with GALL

- AMR tables
  - Table columns re-ordered
  - Active components included
- Aging management programs
  - 9 elements (vice 10 elements)
  - References are international (IAEA and other member states)
  - AMPs in WG2 and WG3 may differ from GALL



## Schedule of IGALL Programme for 2010-13

### 2010

- *September 1-3 IGALL Programme kick-off meeting – SG*
- *December, 6- 8 WG 1 meeting*

### 2011

- *1<sup>st</sup> Q WG 2- 3 meeting (17 – 20 January 2011)*
- *2<sup>nd</sup> Q CG meeting*
- *2<sup>nd</sup>/3<sup>rd</sup> Q WG 1-3 meetings*
- *4<sup>th</sup> Q SG meeting*

### 2012

- *1<sup>st</sup> Q WG 1- 3 meetings*
- *2<sup>nd</sup> Q CG meeting (May 23-24)*
- *3<sup>rd</sup> Q WG 1 (Sept. 10-14), WG2 (Oct. 15-18), WG3 (Sept. 24-28)*
- *4<sup>th</sup> Q SG/CG meeting (Dec. 11-13)*

### 2013

- *1<sup>st</sup> Q WG 1 (Febr. 11-15), WG2 (Febr. 25- March 1), WG3 (March 18-22)*
- *2<sup>nd</sup> Q CG meeting (May 2-3)*
- *3<sup>rd</sup> Q Final SG meeting and IAEA TM on IGALL and plant ageing management (Sept. 23-26)*

## Impact on United States

- We will continue to use GALL
- Understand operating experience and aging management approaches from other participants
  - Review of new information from other countries for relevance to US
  - May propose changes to GALL

## Benefits to U.S.

- Ensures proper use of GALL (context, background, purpose, etc.)
- Enables better international understanding of U.S. philosophy on aging management
- Provides a consensus resource for countries lacking infrastructure of U.S. – safer and more consistent international plant operation
- Opens discussion avenues on international operating experience and approaches to aging management



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# **Upcoming Issuance of Information Notice**

## **“License Renewal Post-Approval Site Inspection Issues”**

Heather Jones

September 20, 2012

# Purpose of the Information Notice

- Inform licensees of IP 71003 inspection issues
- Issues currently considered for inclusion:
  - Inadequate procedures for AMPs
    - Apply thoroughness and attention to detail when implementing/managing post-approval activities for license renewal
  - Mismanagement of commitments/conditions
    - Both the licensee and the NRC need to ensure clear understanding of the intent and expectations of license conditions and commitments

# IN Expectations and Issuance

- NRC expects that recipients will review the information for applicability to their facilities
- No specific action or written response is required
- Issuance is expected by the end of 2012

# Status of ISGs

Wall Thinning due to Erosion Mechanisms

Final LR-ISG-2012-01, 1<sup>st</sup> quarter 2013

Updated Aging Management Criteria for  
Reactor Vessel Internal Components of  
Pressurized Water Reactors

Final LR-ISG-2011-04, 1<sup>st</sup> half of 2013

Aging Management of Stainless Steel  
Structures and Components in Treated  
Borated Water

LR-ISG-2011-01, Editorial correction -Fall 2012

# Status of ISGs – cont.

Changes to the Generic Aging Lessons Learned (GALL) Report Revision 2 Related to Internal Surfaces and Corrosion Under Insulation (CUI ) Aging Effects Requiring Management

Draft LR-ISG-2012-02 , 1<sup>st</sup> quarter of 2013



# Considerations for Subsequent License Renewal

September 20, 2012

**Melanie Galloway, Deputy Director  
Division of License Renewal  
Office of Nuclear Reactor Regulation  
[Melanie.Galloway@nrc.gov](mailto:Melanie.Galloway@nrc.gov)**

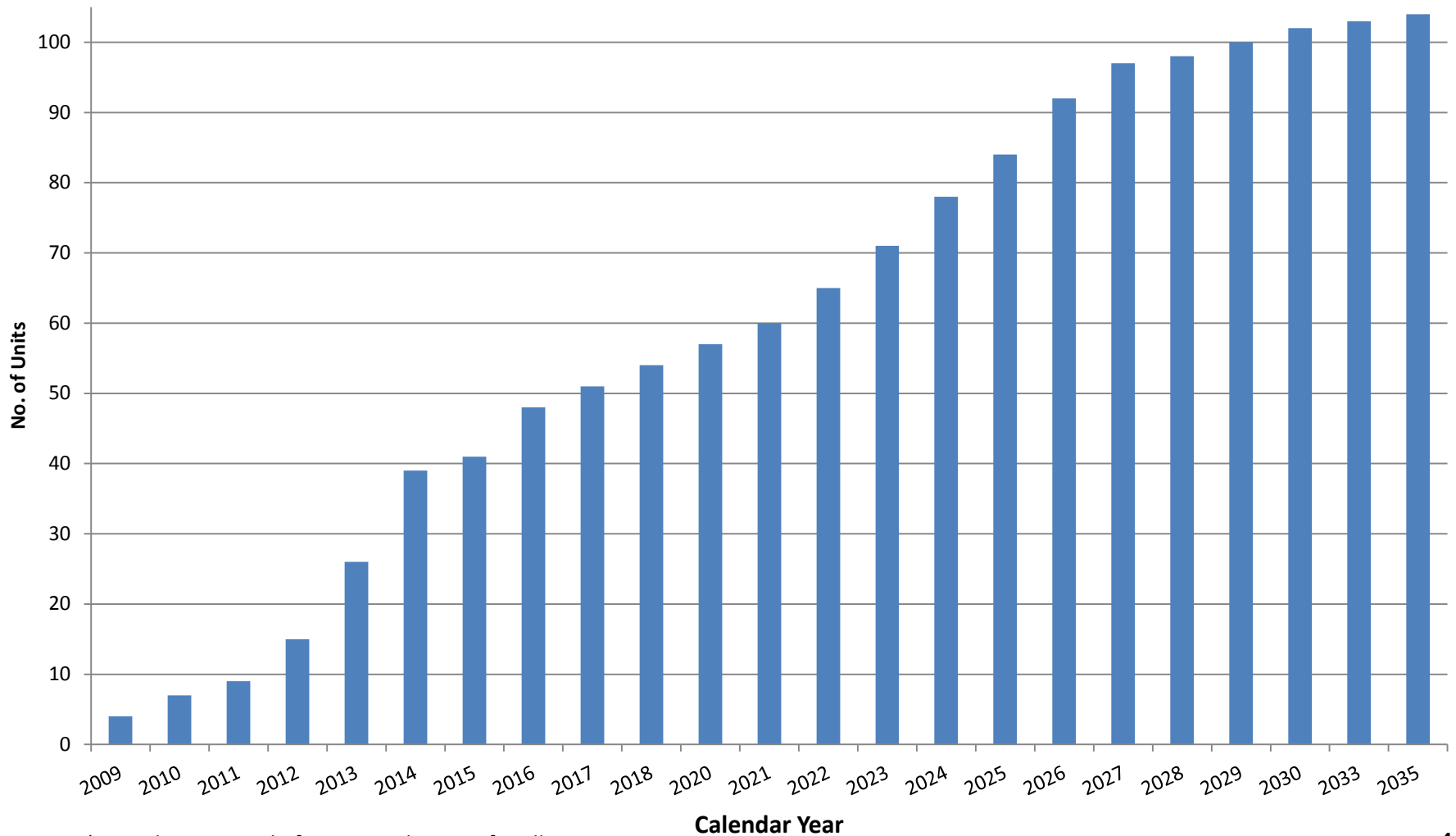
# Overview

- License Renewal Status
- Background
- Industry's Role
- Current NRC Activities
- Importance of Operating Experience
- Considerations for Subsequent Renewal
- Conclusion

# License Renewal Status

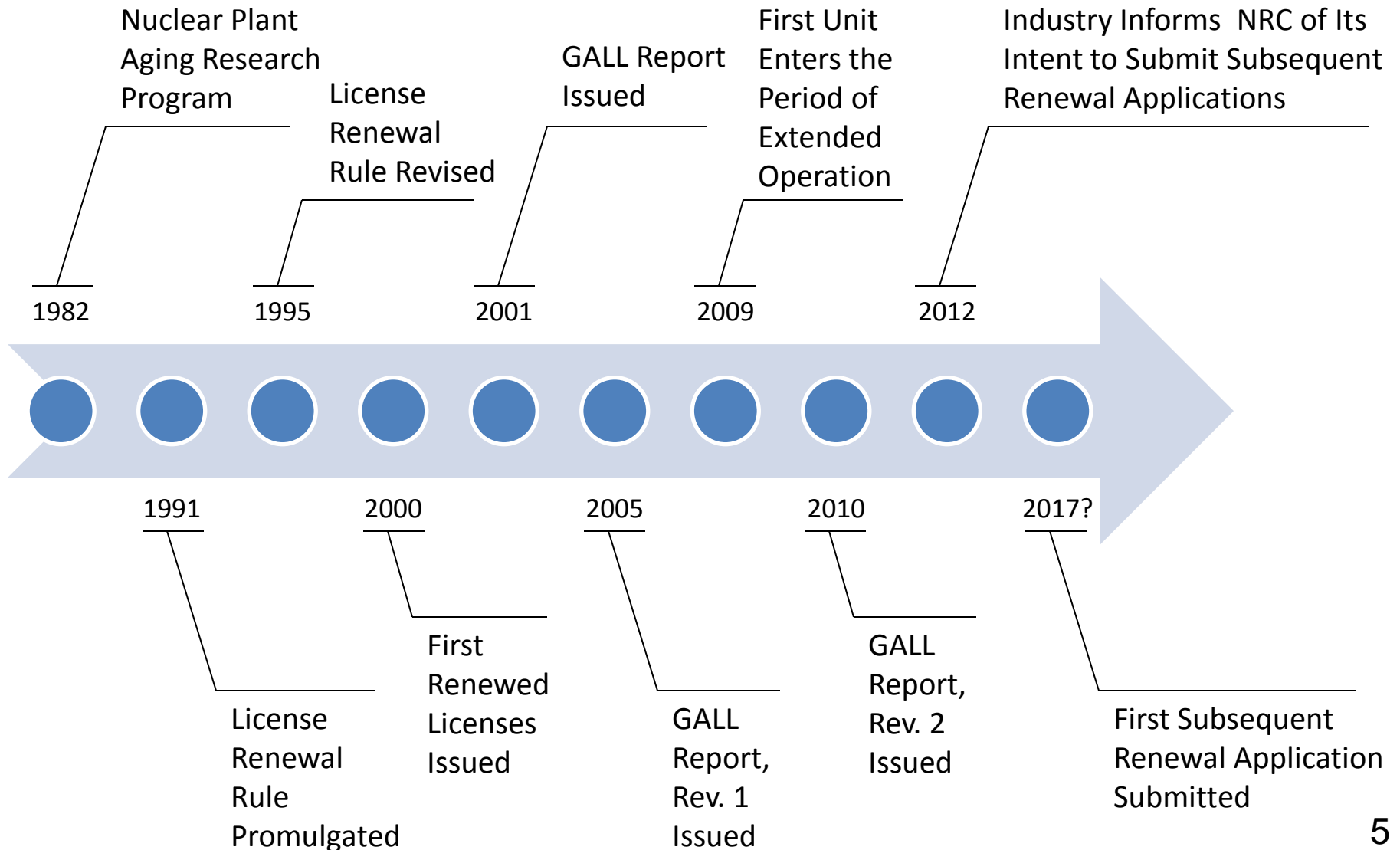
- **First Renewals**
  - Issued renewed licenses for 73 units
  - Currently reviewing applications for 13 units
  - Expect applications for all remaining units
- **Subsequent Renewals**
  - 13 units are in the period of extended operation and eligible for subsequent renewal
  - Industry intends to submit applications for subsequent renewal

## Projection of Total Units in the Period of Extended Operation\*



\* Based on renewal of operating licenses for all 104 units

# License Renewal Milestones



# Industry's Role in Subsequent Renewal

- Take an active lead to develop resolutions to technical issues
  - Adequate understanding of degradation mechanisms
  - Sufficiency of aging management approaches
- Identify specific deliverables and schedules to support initial application submittals

# Current NRC Efforts on Subsequent Renewal

- Technical
  - Aging management program effectiveness reviews
  - Expanded Materials Degradation Assessment
  - Workshops with industry and international colleagues
  - Review relevant domestic and international operating experience
  - Future guidance document updates (e.g., GALL Report)

# Current NRC Efforts on Subsequent Renewal

- Process
  - Held May 9<sup>th</sup> meeting to receive public comments on subsequent license renewal
  - Additional public involvement in fall 2012
  - Commission paper planned



# Importance of Operating Experience

- NRC guidance has evolved to address new aging issues
- Examples
  - Buried piping and tanks
  - Inaccessible non-environmentally qualified cables
  - Spent fuel pool neutron-absorbing materials
  - Pressurized water reactor vessel internals
- Enhancing aging management programs through the ongoing review of operating experience is paramount
- How have licensees enhanced their aging management programs?

# Blocked Fire Protection Piping



# Blocked Fire Protection Piping

- Demonstrates a partial success
  - Fouling was found through implementation of an aging management program
  - Timing should have been earlier to detect the fouling before full blockage of the pipe
- Resulted in NRC finding
  - Licensee failed to incorporate operating experience in accordance with procedures, which impacted the licensee's ability to implement an effective aging management program for the fire protection system

# Failed Containment Tendon



# Failed Containment Tendon

- Broken containment hoop tendon, a passive and long-lived component within the scope of license renewal
- Aging is suspected, although the cause is still being evaluated
- Demonstrates the importance of continually evaluating aging-related degradation mechanisms

# Example Topics to Consider for Subsequent Renewal

1. Maintain “living” aging management programs including upgrades due to operating experience
2. Consider new and significant information in severe accident mitigation alternatives analyses
3. Consider reporting on operating experience and the effectiveness of aging management programs
4. Reconsider past exemptions and evaluations
5. Include within the scope of license renewal items addressed in NRC orders

# Example Topics to Consider for Subsequent Renewal

6. Reconsider renewal term and timing of application
7. Consider aging management in the Reactor Oversight Process and enforceability
8. Conduct a pre-service-type inspection before operating beyond 60 years
9. Reconsider the use of “one-time” inspections
10. Audit aging management program effectiveness and evolution

# Conclusions

- Industry must take an active role in providing the technical basis for long-term operations
- It is prudent for both the NRC and the industry to consider how the license renewal process can be strengthened to ensure safe and environmentally sound plant operation for extended time periods



# Resources

- Submit considerations to the NRC for subsequent renewal: [SLR.Resource@nrc.gov](mailto:SLR.Resource@nrc.gov)
- Summary of the May 9, 2012, public meeting on subsequent renewal: [ML12159A069\\*](#)
- NRC inspection report on blocked fire protection piping: [ML11363A182\\*](#)
- NRC license renewal Web page:  
<http://www.nrc.gov/reactors/operating/licensing/renewal.html>

\* Available in the NRC's Agencywide Documents Access and Management System at  
<http://www.nrc.gov/readingrm/adams.html>

# CENG

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## Industry Use of Operating Experience

NEI LRTF/NRC Meeting

September 20, 2012

Michael Fallin

CENG Fleet Asset Management

# Agenda

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- Site Aging Management Programs (AMPs)
- AMP Infrastructure and Ongoing Performance
- AMP-Informed Operating Experience (OE) Based Plant Changes



# Site AMPs

- CCNPP credits 49 AMPs or activities
- Ginna credits 33 AMPs
- NMP credits 44 AMPs



# Associated Activities for AMP Implementation

- Each site had as many as 500 procedures that required revision or generation for AMP implementation
- Each site had as many as 500 Preventive Maintenance activities that required revision or generation for AMP implementation
- Each plant had/has from 200 to 300 One-Time Inspections to perform before entry into its PEO



# AMP Infrastructure & Performance

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- Implementing Procedures
- Stand alone basis document for each AMP
- AMP Owner Qualification
- AMP activity results documented in Integrated Work Management System
- Site Aging Management Coordinator (AMC) overview



# AMP Infrastructure & Performance (cont'd)

- Any identified aging effects/mechanisms captured in the site Corrective Action Program in Condition Reports (CRs)
- AMP Trend Report generated twice per fuel cycle that documents the CRs written under each AMP
- Plant & Industry Operating Experience (OE)
- Regulatory generic communication
- Fleet Engineering overview – Fleet Program Health reporting



# AMP OE-Informed Plant Changes

- Examples of plant changes, made as a result of plant or industry AMP-based OE, that result in reduction of aging effects:
  - Materials of construction for replaced Steam Generators
  - Materials of construction for replaced Reactor Vessel Heads
  - Heat Exchanger replacements utilizing more degradation resistant materials of construction
  - Coating of Heat Exchanger internals (non-heat transfer surfaces)





# AMP OE-Informed Plant Changes (cont'd)

- Examples of plant changes made based on Plant/Industry OE that result in reduction of aging effects (cont'd):
  - Replacement of Flow-Accelerated Corrosion (FAC) susceptible carbon steel piping with FAC-resistant chrome-molybdenum piping
  - Implementation of Noble Metal Addition and Hydrogen Water Chemistry (BWRs)
  - Installation of O<sub>2</sub> scavenging equipment in Closed-Cycle Cooling Water
  - Adjustment of aging management activity periodicities



# Summary

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AMPs are, in fact, living programs that are maintained and adjusted, as necessary, to ensure preservation of system and component intended functions and to effectively address anomalous discoveries, if and when they occur.



# AMPs are Living Programs

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## Questions?





# **Project: Aging Management Program Technical Assessment for Subsequent License Renewal**

**Rich Tilley**

Sr. Project Manager

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**EPRI Long-Term Operations**

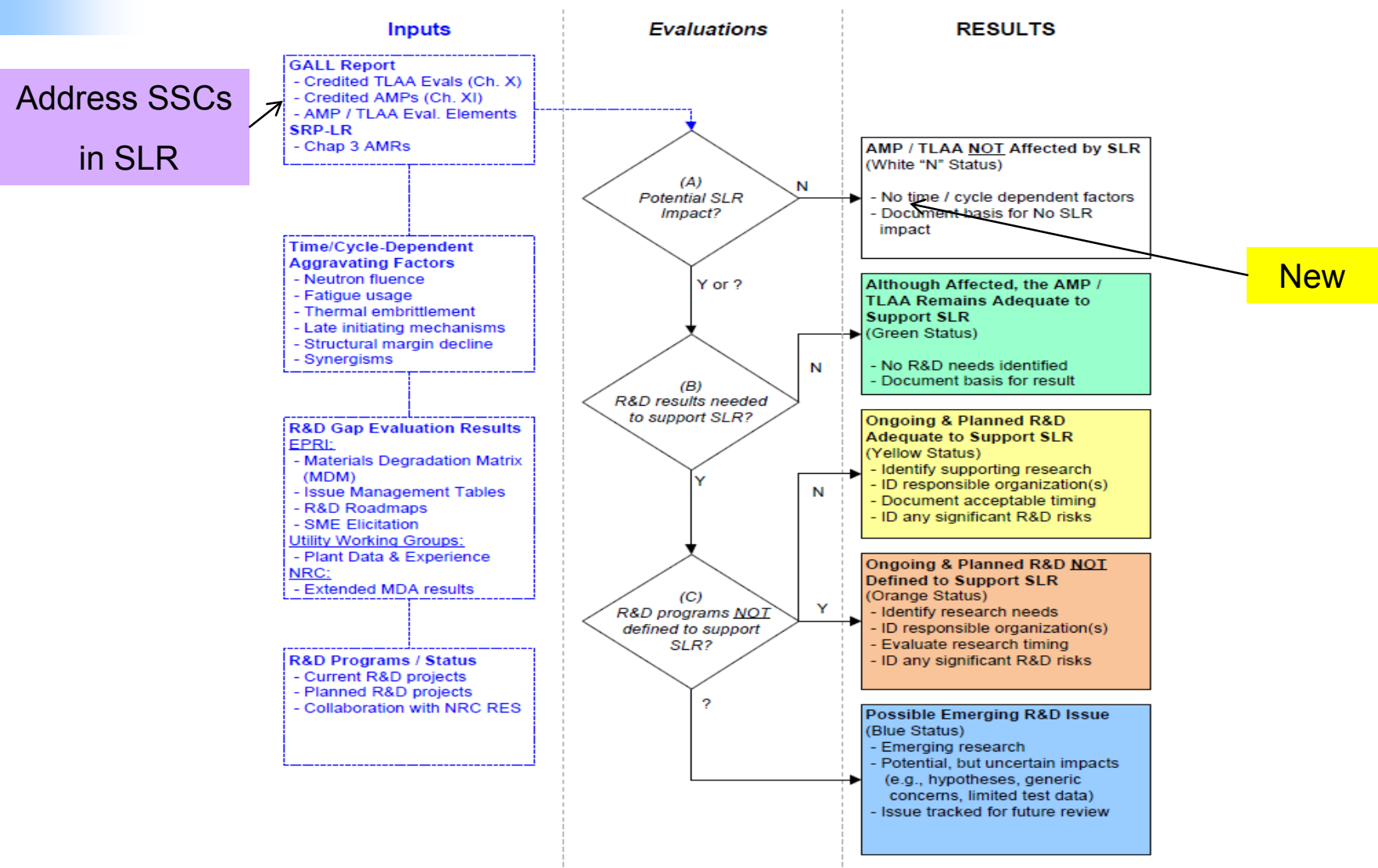
**NEI/NRC License Renewal Meeting**

September 20, 2012

# Objectives

- Develop a **technical** basis/communication document that:
  - Is a proactive industry assessment of technical bases and needs for current Aging Management Programs (AMPs) to support Subsequent License Renewal
    - Looks incrementally at needs for operating beyond 60 years
  - Specifically engages plant-level personnel for input and review
  - Is structured around the current NRC processes and guidance for license renewal (SRP and GALL)

# Flow Diagram for Technical Gap Assessment



AMP / TLAA R&D Evaluation Process

# Inputs and Outcomes

- Engage NEI License Renewal Working Groups for review and comments of applicable sections
  - Mechanical, Electrical, and Structural Areas
  - Additional Technical Review Inputs as Appropriate
  - Another plant perspective versus research focused SMEs
- Input to utilities on technical bases in developing needed changes for plant-specific AMPs to support SLR
- Reference material for NRC consideration
- Expected to be periodically updated

# Framework and Typical Data Sources

- GALL Report: Section XI of the GALL Report will be used as a **framework** for the organization of the report.
  - Review process includes some logical grouping of AMPs – BWR-related, PWR-related, non-Class 1 with periodic inspections, etc... – to facilitate reviews
- EPRI Gap Assessments:
  - Materials Degradation Matrix (MDM): The MDM provides a comprehensive review of degradation mechanisms applicable to light water reactor plant nuclear steam supply system components and assesses the extent to which these degradation mechanisms are understood.
  - Issue Management Tables (IMTs): The IMTs are a summary tool that assist EPRI and the industry in prioritizing and addressing materials related R&D gaps.
- EPRI Strategic Roadmaps: Long-term and strategically significant R&D efforts are tracked by EPRI in summary roadmaps. Input from these documents can be used to evaluate the state and timing of R&D for the materials degradation issues addressed.



# Product Plan

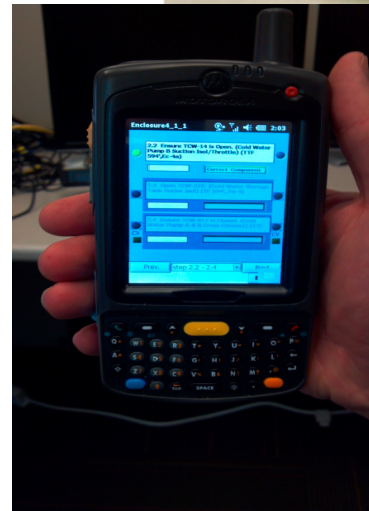
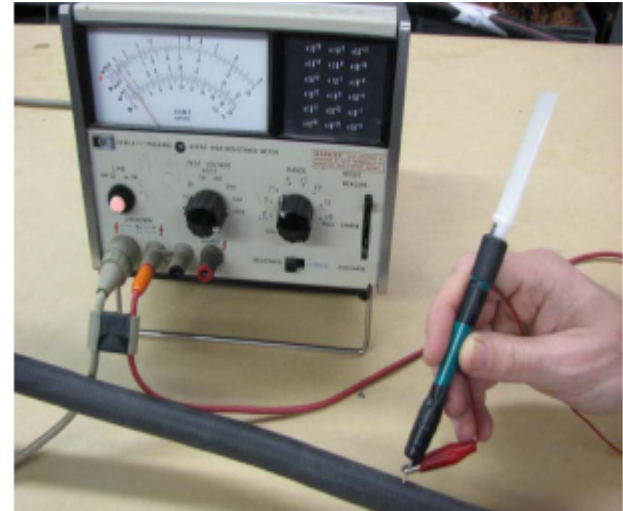
- Solicit AMP-specific input on new/significant issues from reviewers in parallel with developing initial draft
  - Subject matter experts
  - Utility plant working groups (represents plants in PEO)
- Develop draft version
  - Bin AMPs with low risks for changes and highlight those with potential/expected technical issues
  - Provide appropriate sections for follow-on review and resolution of comments
- Iterations to gain consensus from industry
  - Continuing engagement with NRC

# Status

- Draft reviews completed for 34 of 36 Mechanical AMPs and 6 of 8 Structural AMPs. All to be completed by EOM.
  - Phased review process in progress
- Draft summary document for review by EOY
  - Resolution of all reviewer comments
- Document publication in 2013

# Aging Management Programs for 60 to 80 years

- Understanding of aging degradation
  - Mechanisms and failure modes
  - Initiation and growth rates
  - Detection of new degradation mechanisms
- Inspection techniques
- Mitigation strategies
- Condition monitoring
- Prediction of Remaining Useful Life



# EPRI LTO Program Objectives



- ✓ Technical basis for ***decisions*** to operate through an extended period
  - Supports **business case** for Subsequent License Renewal
  - Results by 2014-2019
  
- ✓ Technology to ***manage*** plant assets throughout operating term
  - Includes aging management, asset management, and risk management
  - Addresses safety, performance, and cost

# Criteria for Selecting LTO Activities

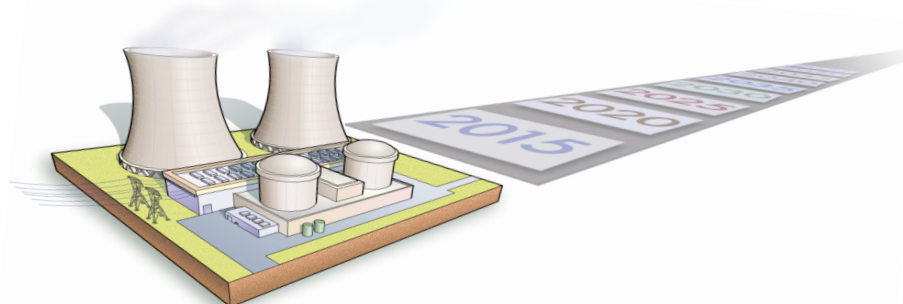
## ✓ **Technical basis for extended operation**

- Investigates a potential “life limiting” issue
- Enhances aging management
- Improves life-cycle management
- Identifies modernization and up-rate opportunity
- Develops enabling technology (e.g., analysis methods)

## ✓ **Not addressed by another EPRI program**

## ✓ **Produces results by 2014 - 2019**

## ✓ **Collaborates with DOE, NRC-RES, member utilities**



# Coordination on Research Timelines

- DOE/EPRI/NRC/NEI Coordination Meetings
- DOE LWRS Program/EPRI LTO Program Joint R&D Plan
  - [https://inlportal.inl.gov/portal/server.pt/community/lwrs\\_program/442/program\\_documents](https://inlportal.inl.gov/portal/server.pt/community/lwrs_program/442/program_documents)
  - Updated Annually
- EPRI Strategic Roadmaps
  - Developed for each EPRI Technical Program
    - Primary System Corrosion Research
    - BWR VIP
    - Materials Reliability Program
    - Long Term Operation Program
    - Etc.

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