

Subsequent License Renewal: Making **SAFE** Operation Beyond 60-Years **POSSIBLE**

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U.S. Nuclear Regulatory Commission

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A scenic view of a coastal town with colorful buildings and a church dome in the background. The text is overlaid on the image.

Hello

Buenas Tardes

Good Afternoon



48 of 97 in PEO* (> 40 years)



94 of 97 first renewal



PEO = Period of Extended Operation

NRC has continuously improved its license renewal reviews

River Bend

License renewed in 2018

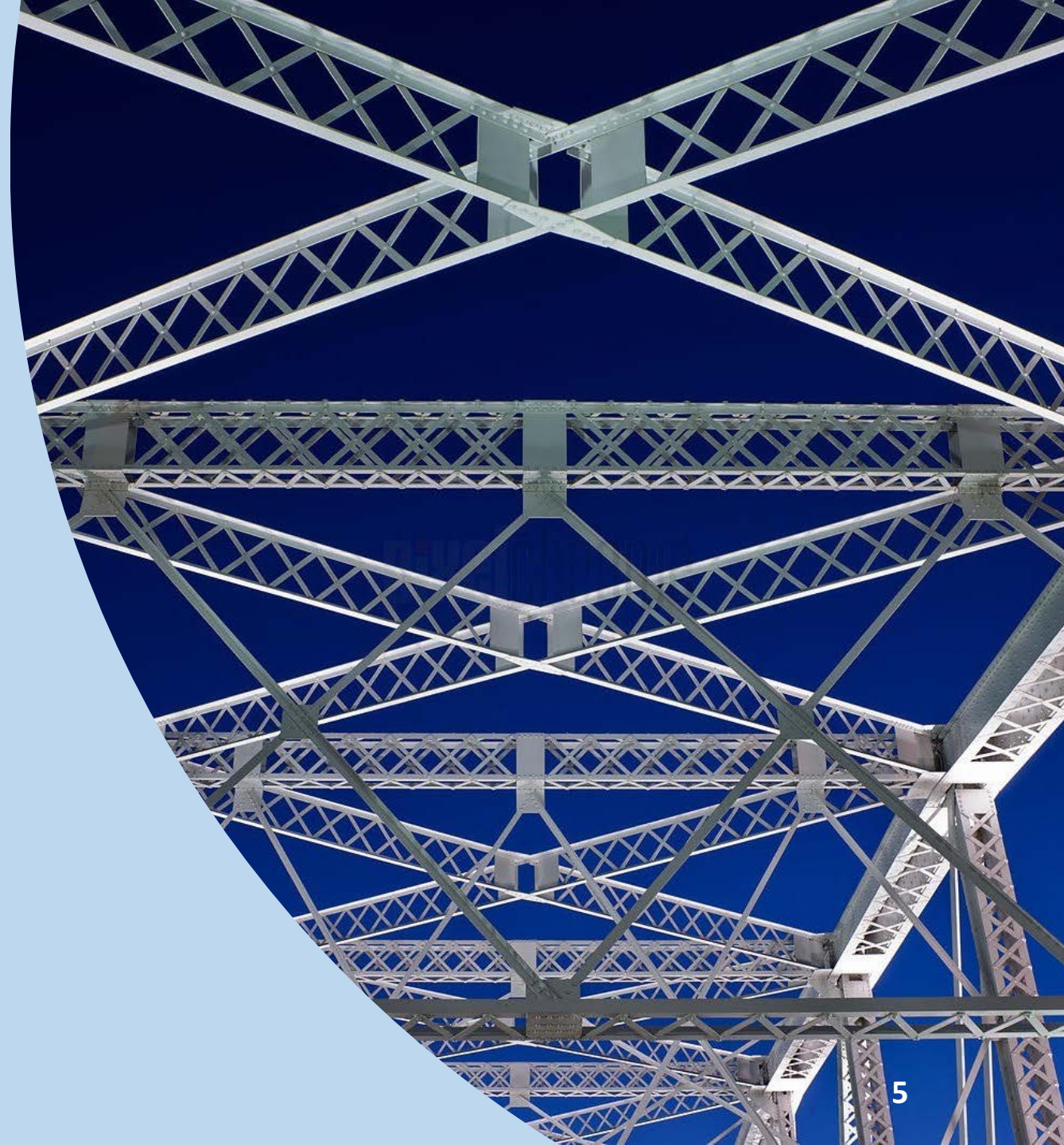
Expires in 2045

NRC review in **16 months**

SER length **430 pages**







SLR Framework

- Builds on lessons learned from initial license renewals
- Optimized review activities:
 - ✓ Pre-submittal meetings
 - ✓ Early outreach to other agencies
 - ✓ Audit process improvements
 - ✓ More use of information technology
 - ✓ Streamlined safety evaluation reports
 - ✓ Better schedule milestone coordination
- **NRC Goal = 18-month technical and environmental review**



LR

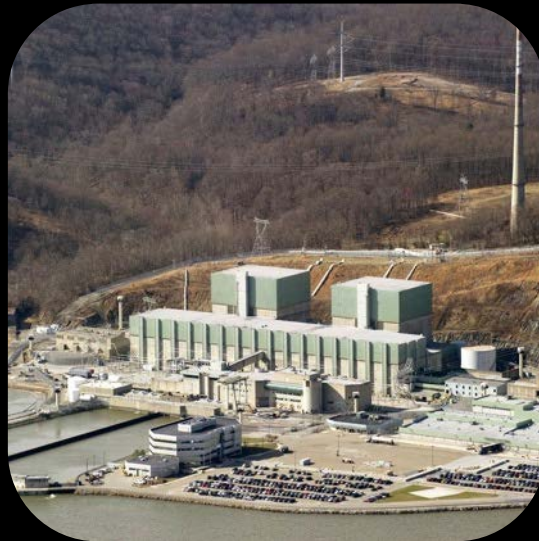
SLR

10 CFR 51 and 54		
Guidance	GALL (NUREG 1801)	GALL-SLR (NUREG 2191) + 4 Key Technical Issues
Timely renewal provision (submit 5-yrs before expiration)		
NRC review focused on ageing management of passive SSCs		

NRC is reviewing 3 SLR applications



- Turkey Point units 3 & 4 (FL)
- Current expiration 2032 & 2033
- Technical and environmental review complete by 10/2019



- Peach Bottom units 2 & 3 (PA)
- Current expiration 2033 & 2034
- Technical and environmental review complete by 03/2020



- Surry units 1 & 2 (VA)
- Current expiration 2032 & 2033
- Technical and environmental review complete by 06/2020

Subsequent license renewal, if approved, may add an additional 20 years for up to a total operating life of 80 years.



29 more SLR applications forecasted

SLR Key Technical Issues (SRM SECY-14-0016)

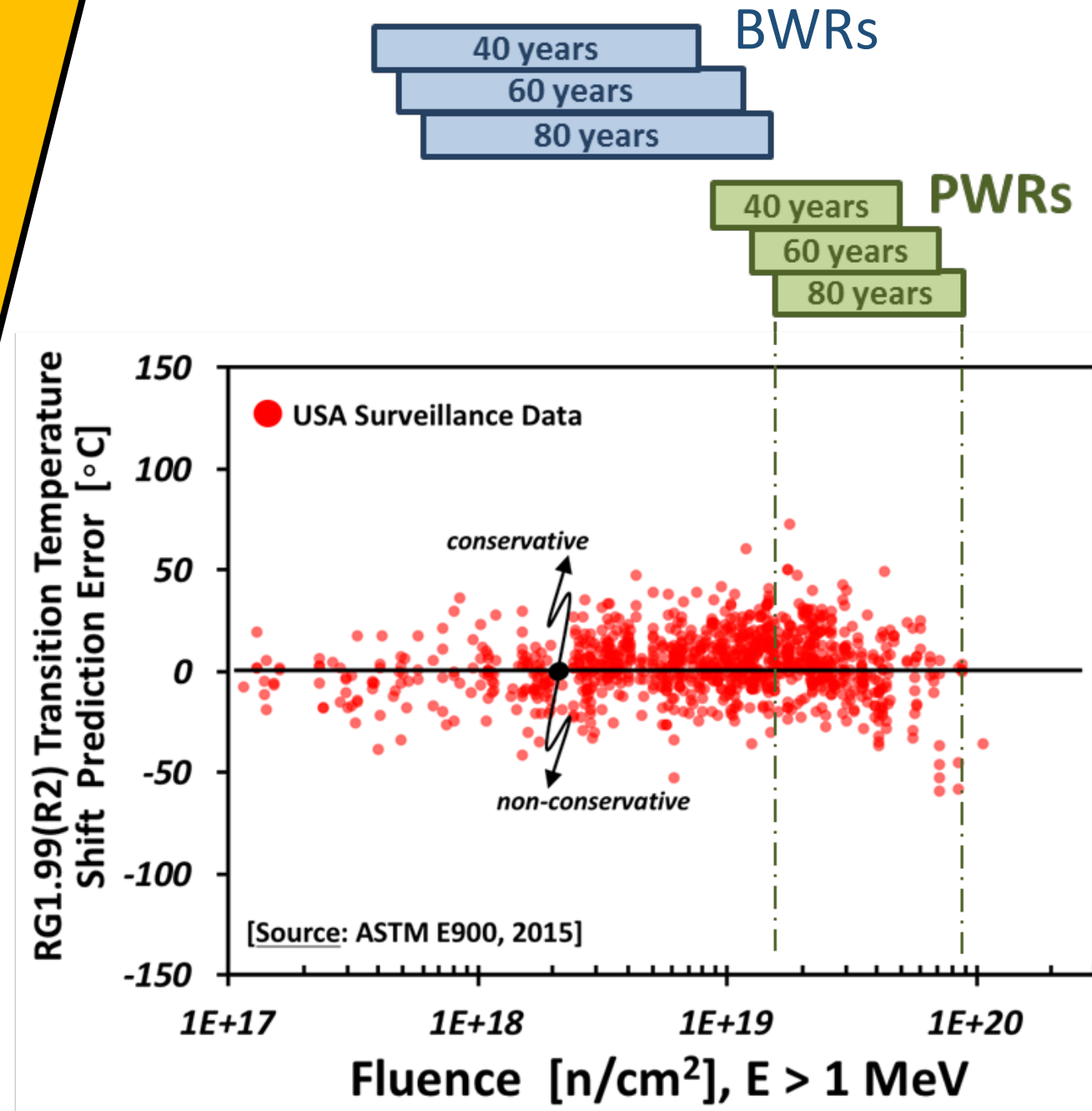
- Reactor pressure vessel neutron embrittlement at high fluence
- Irradiation-assisted stress corrosion cracking (IASCC) of reactor internals and primary system components
- Concrete and containment degradation
- Electrical cable qualification and condition assessment

Reactor Pressure Vessel Integrity

Neutron embrittlement at high fluence

Surveillance testing

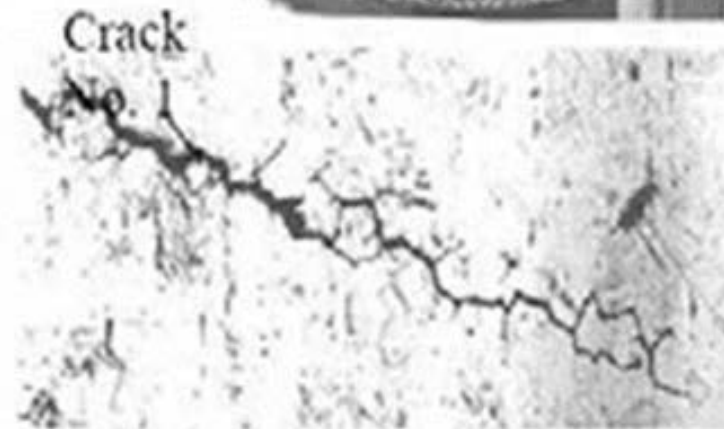
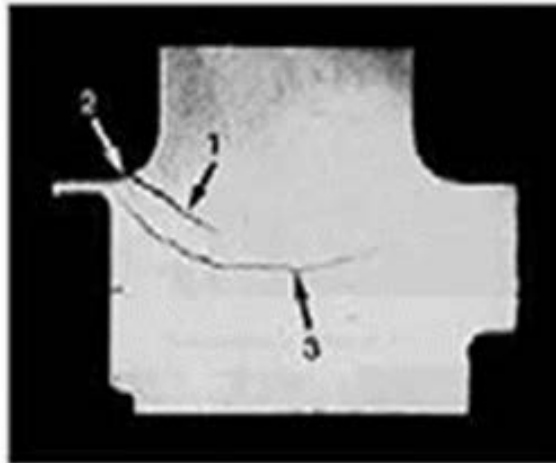
Predictive modelling



Reactor Internals and Primary System

Irradiation-assisted stress corrosion cracking (IASCC)

Materials testing

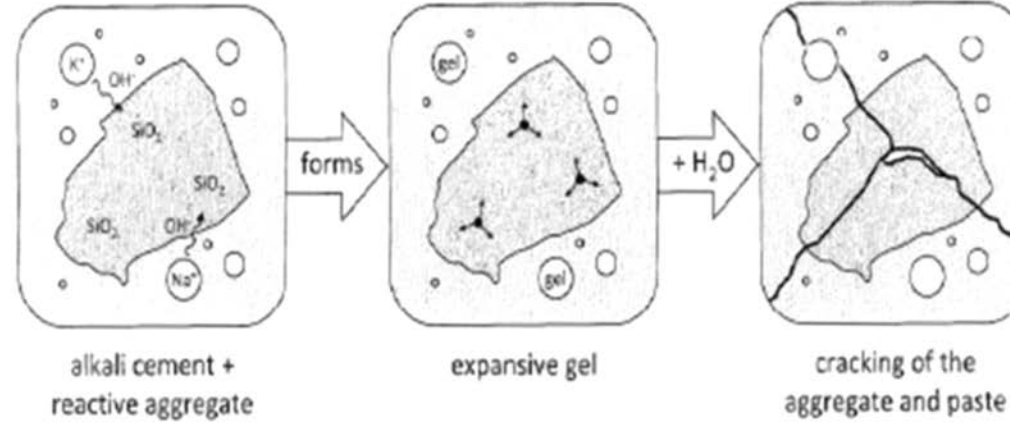


Concrete and Containment Degradation

Structural integrity

Research and testing

- Alkali-silica reaction
- Freeze-thaw effects
- Irradiation effects



N.B. alkali-silica reaction is not a widespread phenomenon in US NPPs



Reactive Aggregate

Cracking through Aggregate

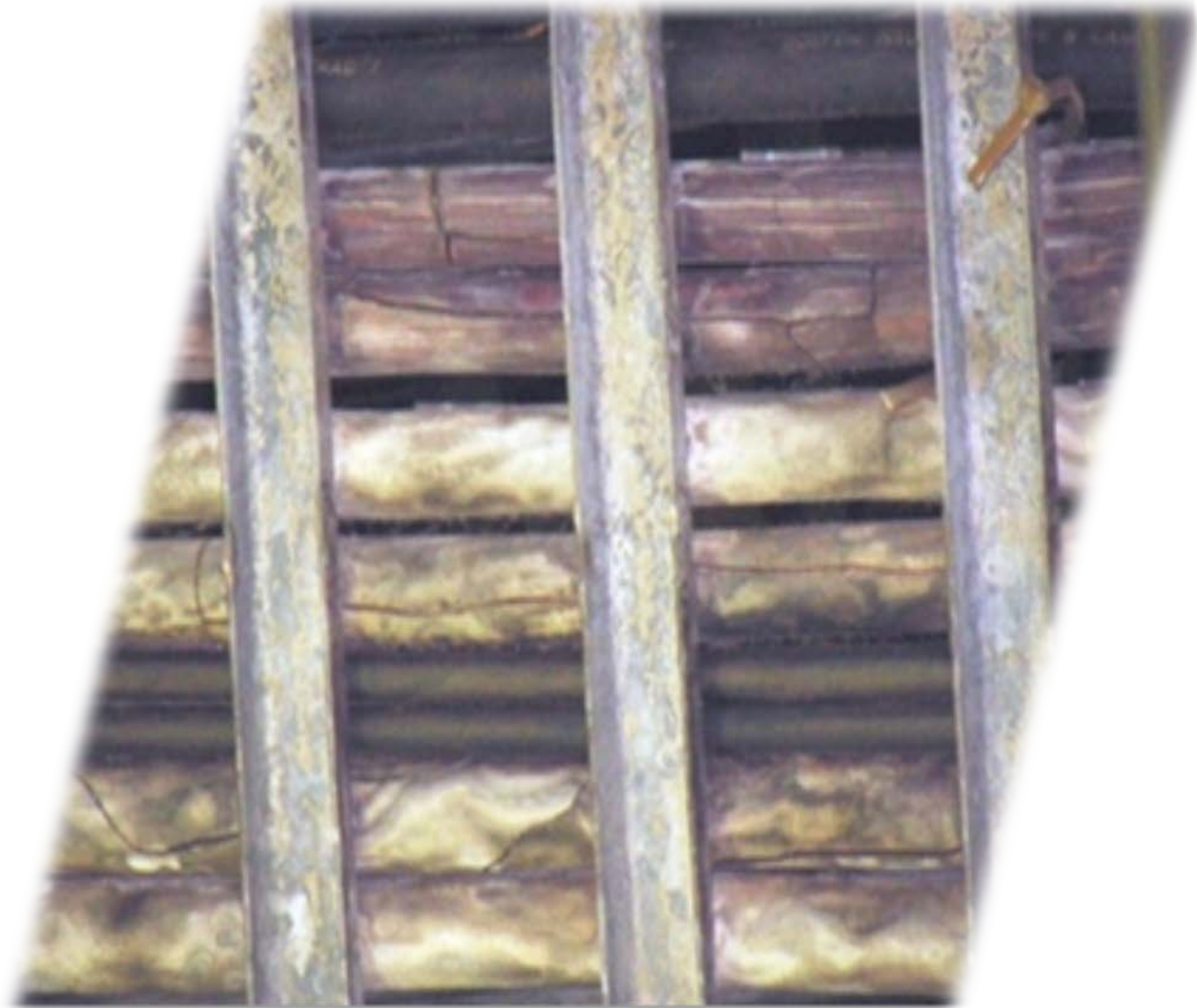
ASR Gel Ring

Electrical Cable Qualification

Synergistic effects

Radiation and thermal

Condition assessment



Jacketed cable



Inspecting License Renewal Performance

- Pre-approval (IP 71002)
- Post-Approval (IP 71003)
- Additional post-approval inspections being added to the Reactor Oversight Process
 - Maintenance Effectiveness
 - Age-related correction actions

Initial SLR Lessons Learned

- Early and frequent communication are beneficial to the review process
- Onsite audits have reduced the need for requests for additional information
- Use of technology improves the effectiveness of audits
- Flexible milestones can still support an 18-month review goal



Scope of review
focused on SSCs of
highest risk

Depth of review
guided by risk
significance





Thank You

Muchas Gracias

Questions?