

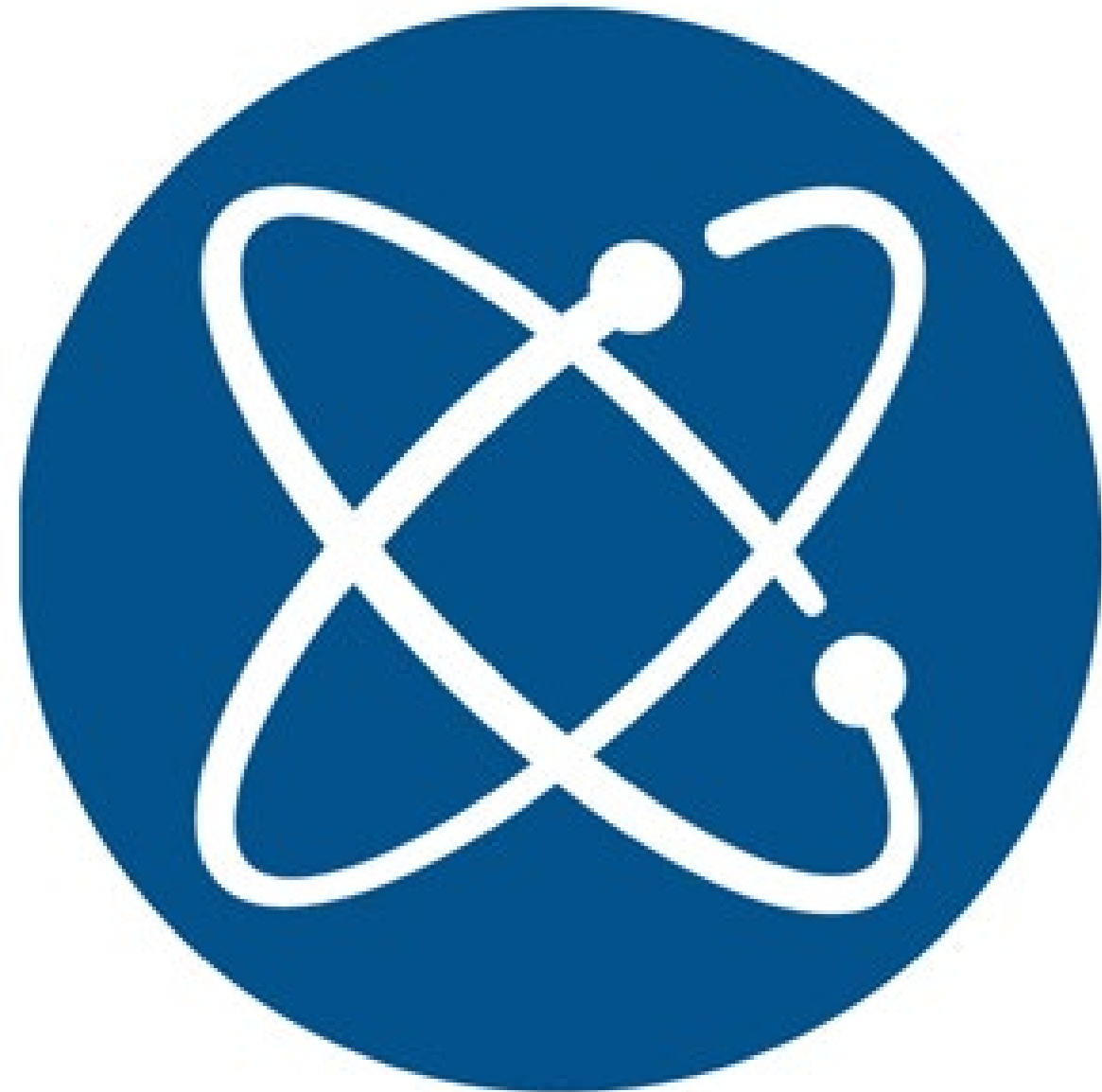


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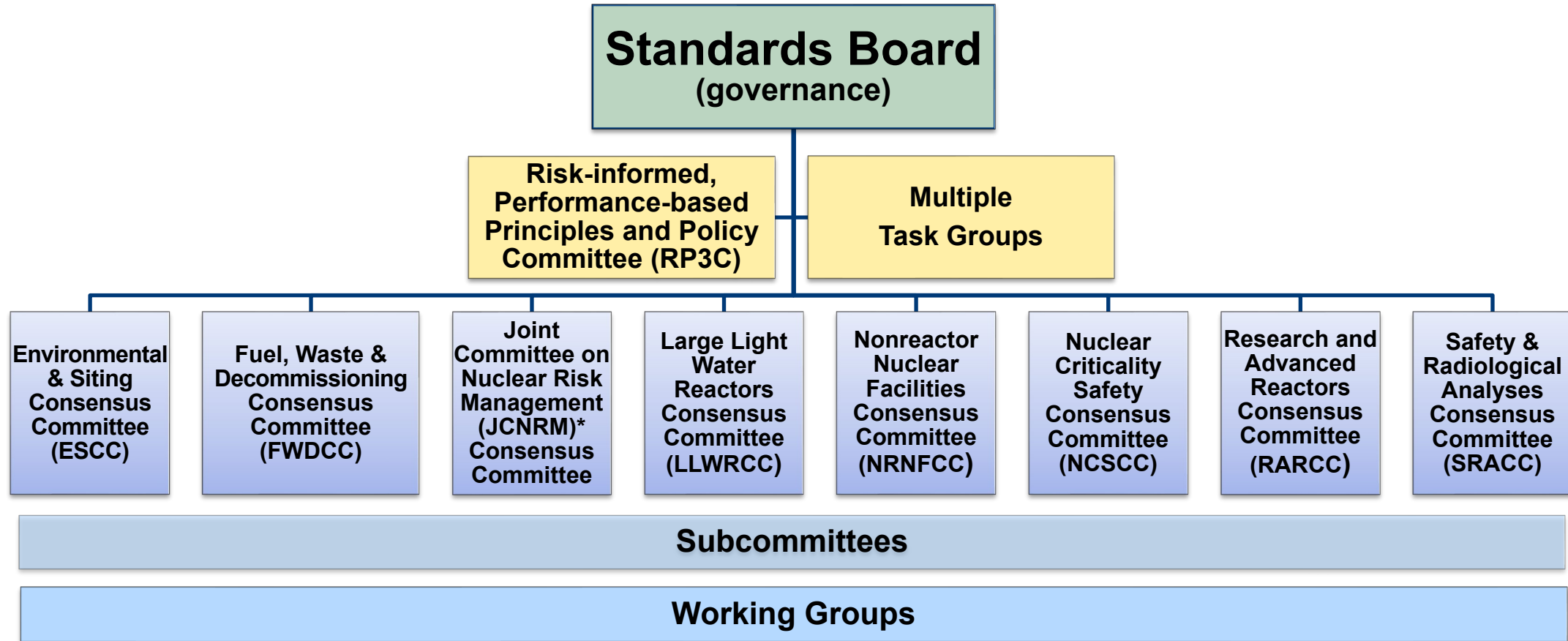
Process for Infrastructure Aging Management and Life Extension of Nonreactor Nuclear Facilities

**Defense Nuclear Facilities Safety Board Public Hearing
Benchmarking Best Practices in Management of Aging Safety
Infrastructure - August 14, 2024**

**Todd Anselmi, ANS Standards Board Vice Chair and ANS-3.14
Working Group Chair**



The ANS Standards Committee



Activities relevant to ARs span all eight consensus committees.

Purpose of ANS-3.14

- Addresses need for a process that provides a systematic review of non-reactor nuclear facility structures, systems, and components (SSCs) for aging management and life extension.
- Provides a methodology to evaluate the site and facility infrastructure, processes, and physical conditions.
- Typical SSCs considered include safety important or other significant elements that can have a detrimental safety, cost, or schedule impact on the enterprise, for example:
 - structures, vessels, piping, large tanks, fire protection systems, building confinement ventilation

Scope of ANS-3.14

- Thousands of SSCs are subject to aging degradation in a nuclear facility, **but** not all affect the long-term reliability of the facility.
- **IN SCOPE:** SSCs that are typically long-lived and passive may not be within the scope of engineering and maintenance programs and degradation is not always apparent until more consequential failure occurs.
- **NOT IN SCOPE:** Active components that fall within the scope of engineering or maintenance programs (e.g., pressure boundary testing or preventive maintenance) and, upon failure, would be typically detected by these programs or identified.

What ANS-3.14 Provides the User

A process for scoping and screening of SSCs

A process for the identification of facility degradation and aging mechanisms

Guidance on development of an Aging Management Program (AMP) to manage the resulting degradation

Selection of Facility Systems, Structures, and Components (SSCs)

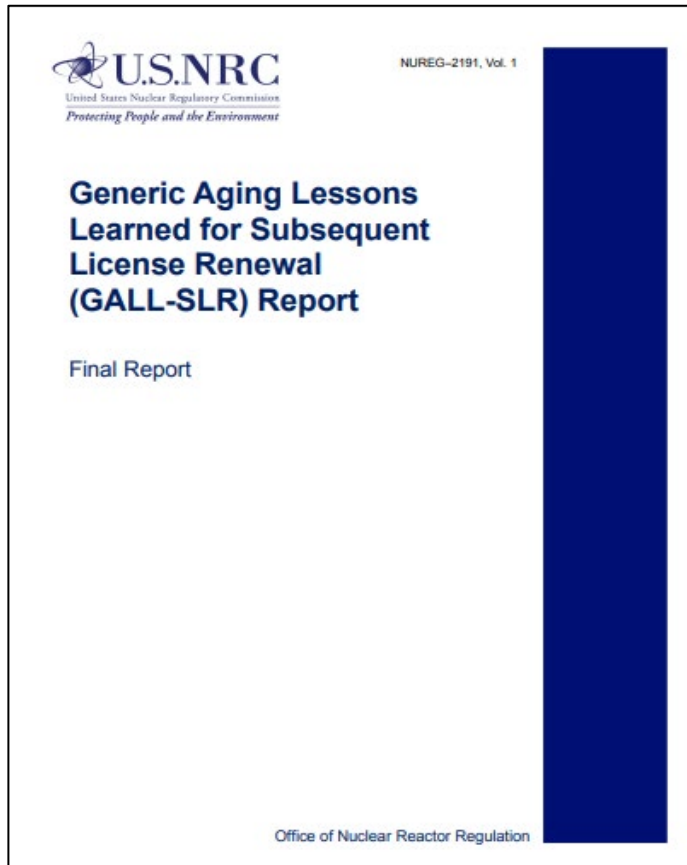
Selection (or screening) considers factors such as the importance of the SSC to safe and reliable operation of the facility.

- Selection starts with the entire system and down selects these systems, or portions of a system, that can negatively impact facility operations, or safety.
- These systems are further evaluated at the structure and component level.

- ✓ Safety important function
- ✓ Facility outage
- ✓ > \$ value to correct
- ✓ Recurring issue
- ✓ Management discretion

Review for Aging Mechanisms

ANS 3.14 suggests a similar process as used by the US commercial nuclear power plants to accomplish the review for aging degradation mechanisms.



- Numerous materials and environmental conditions are included in the USNRC Generic Aging Lessons Learned (GALL) Reports (NUREGs-1801 and -2191). *NOTE that this is not a requirement and that other sources can be used.*
- Known degradation mechanisms are then identified with the material/environment combinations.
- Facility then determines if the degradation mechanism is currently being managed by facility processes or programs.
- If not managed, then flagged for development of a new Aging Management Program (AMP).

What is an Aging Management Program

Using the results of the Aging Management Review, determine the effectiveness of current programs or need for a new program.

- Current programs typically involve components that perform standby or active functions.
- Potential failure is identified through testing, condition monitoring and periodic inspections.
- Many programs today typically do not address long lived components or structures that often require special access or sampling.

Facilities may have programs currently in place which provide some aging management capability

- Predictive and preventive maintenance programs
- System Health Monitoring and Reporting
- Spare parts and obsolescence programs
- Structural monitoring

AMP Implementation & Facility Life Extension

Management of aging mechanisms is only one part of an overall life extension plan for a nuclear facility.

- Facility may have to plan for procurement of replacement equipment and upgrades.
- These decisions are based on the facility needs and future operating strategy and are not specifically addressed in this standard.
- Appendix provides facility managers some context to develop a strategy.



Figure D.3 – Extended life program

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