



**U.S.NRC**

United States Nuclear Regulatory Commission

*Protecting People and the Environment*

# Spent Fuel Storage Renewal Strategy Development

Kristina Banovac

NMSS/SFST/SMMB

Aladar A. Csontos

NMSS/SFST/SMMB

NEI Used Fuel  
Management Conference  
May 6, 2014

# Key Messages from RIC

## Storage Renewal Guidance Improvement

- Predictable Flexible Efforts to Regulatory Stability with Stakeholder Engagement
- Storage Renewal Strategy Improvement
  - Operations-focused Aging Management
  - Learning, Proactive, & Responsive Aging Management Approach
- NUREG-1927 Update(s)
- Storage Aging Management (SAM) NUREG
  - GALL-like AMP/TLAA Guidance

# Background

## Spent Fuel Storage Renewal Requirements



- Renewal of ISFSI licenses & CoCs for a period not to exceed 40 years (10 CFR 72.42 & 72.240)
- Time-limited aging analyses (TLAAs) that show ITS SSCs perform their intended function for the requested period of extended operation
- Description of Aging Management Programs (AMPs) for issues associated with aging that could adversely affect ITS SSCs
- Design bases information as documented in the recently updated final safety analysis report

# Background

## NUREG-1927 SRP for Renewals



- Guidance located in NUREG-1927 (Standard Review Plan for storage renewal)
- NUREG-1927, SRP for Renewal of Spent Fuel Dry Cask Storage System Licenses and Certificate of Compliances (CoC)
  - Provides NRC guidance for renewal of Independent Spent Fuel Storage Installation (ISFSI) licenses and CoCs for storage cask designs
  - Issued in March 2011 to accompany the 10 CFR Part 72 final rulemaking for “License and Certificate of Compliance Terms”

# Current Challenges

## Current Renewals & Guidance

- 2 ISFSI license and 1 storage cask design CoC renewal applications currently under staff review
- ~11 ISFSI license and storage CoC renewal applications expected within next 6 years
- Currently, multiple year reviews & RAI cycles
- NUREG-1927 (2011): SRP for Renewal of SF DCS Licenses & CoCs to provide staff guidance
- Staff review experience of renewal applications indicates that NUREG-1927 guidance may need improvements, e.g. AMPs, TLAA's, etc.

# Current Challenges

## Modes of Materials Degradation

- Storage & reactor operating experience indicates potential degradation of SSCs
  - IN 2013-07: Premature degradation of cask structures and components from environmental moisture
  - IN 2012-20: Chloride-Induced Stress Corrosion Cracking (CISCC)
- Known vs. Unknown degradation mechanisms
- Difficult to define and assess all operable degradation modes for all potential chemistries for all locations

# Path Forward

## Storage Renewal Strategy Team



- Established Storage Renewal Strategy Team
- Members from across NRC – Kickoff 12/18/13
- Mission:
  - Reflect on storage/reactor operational experiences, staff’s storage renewal review experiences, reactor license renewal experience, and existing guidance
  - Assess current storage renewal regulatory framework to determine if changes (e.g., guidance updates and/or guidance development) are needed
  - Develop learning, proactive, & responsive approach

# Path Forward

## Operations-Focused Approach

- Based on achievable operational methodologies:
  - Condition based monitoring and/or in-service inspections (ISI)
- Assessment of monitoring and/or ISI findings and data
- Report, aggregate, & trend operational experiences
- Criteria for actions/decisions:
  - Prevention, repair, replacement, or mitigation measures
- Learning AMPs that assess and respond to operating experience and incorporate confirmatory research
- Update of NUREG-1927 SRP
- Development of DSC-focused GALL-like Guidance (Storage Aging Management (SAM) NUREG)

# Path Forward

## Potential Guidance Updates or Development



- High-priority AMP Development (underway)
- NUREG-1927 (updates)
- SAM NUREG (develop)
- Extensive stakeholder engagement 2014-2015
- Inspection guidance for inspection of licensees' aging management activities (AMAs) in the period of extended operation (develop)
- Internal NRC guidance for licensing reviews of renewal applications (develop)

# Acronyms

- AMP: Aging Management Plan
- AMR: Aging Management Review
- CISCC: Chloride Induced Stress Corrosion Cracking
- CoC: Certificate of Compliance
- DCSS: Dry Cask Storage System
- GALL: Generic Aging Lessons Learned Report (NUREG-1801)
- ISFSI: Independent Spent Fuel Storage Installation
- ITS: Important to Safety
- LR: License Renewal
- HBUF: High-Burnup Fuel
- NMSS: NRC Office of Nuclear Material Safety and Safeguards

- NRR: NRC Office of Nuclear Reactor Regulation
- OpE: Operational Experience
- RAI: NRC Request for Additional Information
- RSI: NRC Request for Supplemental Information
- SAM: Storage Aging Management Report (Future NUREG Report)
- SRP: NRC Standard Review Plan
- SSC: Structure, System, and Components
- TLAA: Time Limiting Aging Analysis