

Introduction and Operations-Focused Approach to Aging Management

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Meeting to Obtain Stakeholder Input on Potential
Changes to Guidance for Renewal of Spent Fuel Dry
Cask Storage System Licenses and Certificates of
Compliance

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Background

Spent Fuel Storage Renewal Requirements

- Renewal of Independent Spent Fuel Storage Installation (ISFSI) licenses and storage cask designs for a period not to exceed 40 years (10 CFR §72.42 and §72.240)
- Time-limited aging analyses
- Description of the Aging Management Program (AMP)
- Design bases information as documented in the most recently updated final safety analysis report

Background

Current Spent Fuel Storage Renewal Guidance



- Guidance located in NUREG-1927, Standard Review Plan for Renewal of Spent Fuel Dry Cask Storage System Licenses and Certificate of Compliances (CoCs)
 - Provides NRC guidance for renewal of 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 Renewal Reviews & Guidance

- 2 ISFSI license and 1 storage cask design CoC renewal applications currently under staff review
- Currently, multiple year reviews & request for additional information cycles
- ~11 ISFSI license and storage CoC renewal applications expected within next 6 years
- Staff review experience of renewal applications indicates that NUREG-1927 guidance may need enhancement in several areas

Current Challenges

Modes of Materials Degradation

- Storage & reactor operating experience indicates potential degradation of structures, systems, and components
 - 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 Team

- Established Storage Renewal Team with members from across NRC to:
 - Assess current storage renewal regulatory framework to determine if changes (e.g., guidance updates and/or guidance development) are needed
 - Reflect on storage operating experience, staff's storage renewal review experience, and reactor renewal experience
 - Develop learning, proactive, and responsive approach to renewals
- Storage Renewal Team currently working to address questions and issues related to storage renewal applications and staff reviews

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/Living” AMPs that assess and respond to operating experience and incorporate results of confirmatory research

Path Forward

Potential Guidance Updates or Development

- High-priority AMPs (develop)
- NUREG-1927 (update)
- Storage Aging Management NUREG (develop)
 - Dry cask storage – focused aging management guidance, similar to NUREG-1801, Generic Aging Lessons Learned Report
- Inspection guidance for inspection of licensees' aging management activities in the period of extended operation (develop)
- Internal NRC guidance for licensing reviews of renewal applications (develop)

Purpose and Focus of This Meeting

- Staff is soliciting stakeholder input on staff's current considerations for revisions to NUREG-1927 and will consider the input as it develops the draft revised guidance for public comment
- Potential NUREG-1927 guidance updates under consideration include the following:
 - Implementation of an operations-focused approach and “learning/living” AMPs
 - More detailed guidance on elements of AMPs
 - Examples of AMPs for canisters and concrete
 - “Lead” system inspection
 - Format and content of CoC renewal applications
 - Considerations for CoC renewals and general license implementation of AMPs
 - Fuel performance and cask/canister internals

Public Involvement and Schedule for NUREG-1927 Update

- Consider stakeholder input received during this meeting in development of draft revised guidance
- Assess need for additional public meetings
- Publish draft revised guidance for public comment before end of calendar year 2014 (schedule will depend on public/stakeholder input received at public meeting(s))
- After consideration of public comments on draft guidance, publish final guidance in Summer 2015

Current Considerations for Operations-Focused Approach: Operating Experience

- Backward-look and forward-look at operating experience (OE)
 - Consider past OE for development of AMPs
 - Consider ongoing OE for implementation of AMPs (“learning/living” AMPs)
- Framework for collecting and sharing dry cask storage system (DCSS) / ISFSI aging-related OE
 - Institute of Nuclear Power Operations OE database – some entities (CoC holders, ISFSIs at shutdown or decommissioned reactor sites) may not be a part of; question of being able to filter/search for DCSS/ISFSI aging OE
 - Industry exploring this area
- Rely on NRC inspection findings from inspections of AMP implementation
- Consider need for conditions in licenses and CoCs re: reporting of age-related ISFSI/DCSS OE

Current Considerations for Operations-Focused Approach: Learning AMPs

- What should a learning AMP respond to?
 - Operating experience at the ISFSI site
 - Operating experience at other ISFSI sites that use the same DCSS
 - Relevant research and industry initiatives (e.g., work on CISCC)
 - New technologies that are deployable (e.g., future tools/techniques for examination/inspection of DCSSs)
 - Development of, or changes to, consensus codes and standards (either referenced in AMP already or applicable to a particular AMP for the DCSS)
- Licensees and CoC holders to assess AMP effectiveness by evaluating OE on an ongoing basis
 - Appropriate time periods / intervals for evaluation of AMP effectiveness?

Current Considerations for Operations-Focused Approach: Learning AMPs for CoCs

- General licensees report aging-related entries/inputs from their corrective action programs to CoC holder
 - Include as a condition in the CoC or does adequate framework already exist for this sharing of OE?
- CoC holder tracks, aggregates, and evaluates on a periodic basis, OE from general licensees
 - Evaluate to determine if AMP is effective or whether changes are needed
- CoC holder provides a summary report of its evaluations to NRC on a periodic basis
 - Include as a condition in the CoC?

Discussion Topics

- Framework for collecting and sharing DCSS / ISFSI aging-related OE
- Consider need for conditions in licenses and CoCs re: reporting of age-related ISFSI/DCSS OE
- What should a learning AMP respond to?
- Appropriate time periods / intervals for evaluation of AMP effectiveness?
- Summary report of evaluation of AMP effectiveness?
- Learning AMPs for CoCs – how will general licensees share/report OE to CoC holder?

References

- 10 CFR Part 72
<http://www.nrc.gov/reading-rm/doc-collections/cfr/part072/>
- “License and Certificate of Compliance Terms” Final Rule
<http://www.gpo.gov/fdsys/pkg/FR-2011-02-16/pdf/2011-3493.pdf>
- NUREG-1927
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1927/>
- NUREG-1801
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1801/>
- IN 2013-07
<http://pbadupws.nrc.gov/docs/ML1232/ML12320A697.pdf>
- IN 2012-20
<http://pbadupws.nrc.gov/docs/ML1231/ML12319A440.pdf>

Acronyms

- AMP – Aging Management Program
- CFR – Code of Federal Regulations
- CISCC – Chloride-Induced Stress Corrosion Cracking
- CoC – Certificate of Compliance
- DCSS – Dry Cask Storage System
- IN – Information Notice
- ISFSI – Independent Spent Fuel Storage Installation
- ISI – In-Service Inspection
- OE – Operating Experience