



Improving the Spent Fuel Storage and Transportation Regulatory Framework

Michael D. Waters
Kristina L. Banovac

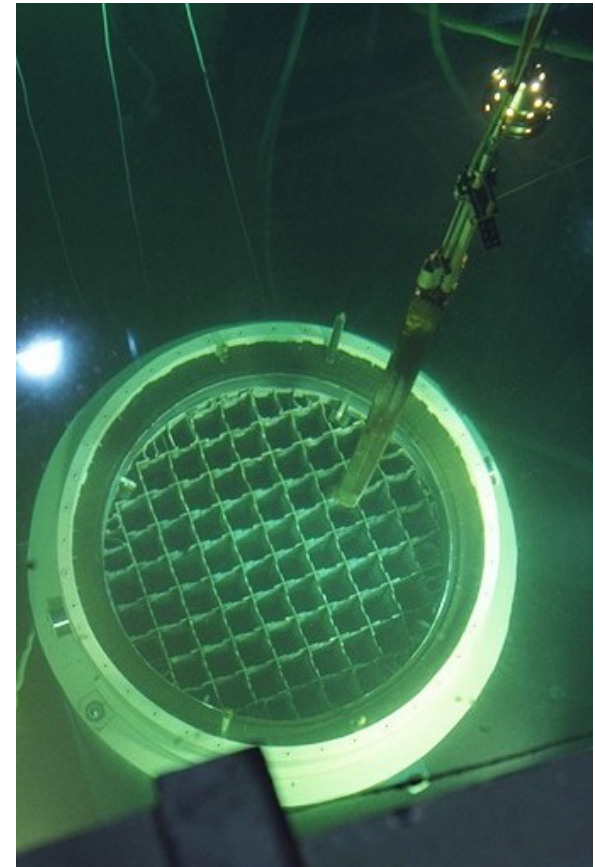
Meeting to Obtain Stakeholder Feedback on Enhancements
to the Licensing and Inspection Programs for
Spent Fuel Storage and Transportation
August 16, 2012

Key Points

- A New Paradigm
- Process Overview
- What is Success?

NRC Oversight of Commercial Spent Fuel*

- Spent fuel pools at 65 reactor sites in 31 States
 - 175,000 fuel assemblies
- Dry storage casks at 58 operating storage facilities
 - Over 60,000 fuel assemblies
 - Over 1600 loaded dry storage casks
 - Over 50 approved storage cask design variations



*Approximate values from various sources including NRC Digest, UxConsulting, Gutherman Technical Services, and NEI (2011-2012)

Regulatory Framework

- Key Legislation
 - Nuclear Waste Policy Act; Atomic Energy Act
- Key Regulations
 - 10 CFR Part 71
 - 10 CFR Part 72
 - 10 CFR Part 50
- NRC Guidance
 - Regulatory Guides; NUREGs; Staff Guidance
- Licensing and Inspection Procedures
 - Internal Office Instructions; Inspection Manual

Key Storage and Transportation Regulatory Activities

- Review Emergent Storage and Transportation Certification Needs
- **Improve the Regulatory Framework for Storage and Transportation under a New Paradigm**
- Develop a Technical Basis for Extended Storage and Transportation

A New Paradigm

- U.S. is still assessing new options for disposal and centralized storage
- Spent fuel will be stored for much longer times and transported with new approaches than that initially conceived by industry and policy makers, when the current framework was developed
- Experience has demonstrated the safety provided within the current regulatory framework, but has also indicated opportunities for improved integration, efficiency, and effectiveness

Process Overview

- Consider past licensing and inspection experience
- Targeted stakeholder feedback
- Develop recommendations, which may include changes to regulations, policy, guidance, or NRC procedures or processes
- Implement framework improvements, as warranted

Stakeholder Input – First Meeting

- July 27, 2011
 - Compatibility and integration of 10 CFR Parts 71 and 72 requirements for dual purpose casks
 - Streamlining process for 10 CFR Part 72 cask certification
 - Inspection Program

Stakeholder Input – This Meeting

- Compatibility of Requirements for Storage and Transportation of Spent Nuclear Fuel - Retrievability, Cladding Integrity, and Safe Handling
- Regulating Stand-Alone Independent Spent Fuel Storage Installations
- Applicability and Consistency of Spent Fuel Storage Regulatory Framework
- Administration of Storage Certificates of Compliance (CoCs) and Amendments to CoCs
- Inspection Process Improvements

Key Milestones (Licensing Review)

- January 2013 – Provide opportunity for formal stakeholder comments (issue Federal Register Notice)
- 2013 – 2014 – Develop recommendations for improving the licensing framework; consult with the Commission, as needed
- 2013 – 2016 – Guidance updates (as needed)
- 2015 – 2018 – Rulemaking (if needed)

Key Milestones (Inspection Review)

- 2011 – Staff completed internal review and developed recommendations for enhancing the inspection program
- 2012 – Staff is currently implementing approved recommendations
- 2013 – Staff plans to complete implementation of recommendations

What is success?

- Framework maintains continued safety
- Regulatory policy issues in new paradigm are successfully identified and resolved
- Regulatory improvement areas from two decades of experience are addressed for improved effectiveness
- Framework remains flexible for new technologies and future changes in National spent fuel management policy

Feedback



Additional Information

- References and Background -

References

- *Near-Term Program Improvements*
 - <http://www.nrc.gov/waste/spent-fuel-storage/public-involvement.html>
 - COMSECY-10-0007, “Project Plan for the Regulatory Program Review to Support Extended Storage and Transportation of Spent Nuclear Fuel” (ML101390216)
- *Extended Storage and Transportation*
 - SECY-11-0029, “Plan for the Long-Term Update to the Waste Confidence Rule and Integration with the Extended Storage and Transportation Initiative” (ML110330445)
 - SECY-12-0078, “Annual Status Report: Activities Related to Extended Storage and Transportation and the Long-term Waste Confidence Update” (ML12129A231)
 - “Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel (Draft Report for Comment),” May 2012 (ML120580143)
- *Waste Confidence*
 - “Background and Preliminary Assumptions For an Environmental Impact Statement—Long-Term Waste Confidence Update (Draft Report for Comment),” December 2011 (ML11340A141)

References (cont.)

Other Activities

- SECY-11-0093, “Near-Term Report and Recommendations for Agency Actions Following The Events in Japan” (ML11186A950)
- SECY-12-0095, “Tier 3 Program Plans and 6-month Status Update In Response to Lessons Learned from Japan’s March 11, 2011, Great Tohoku Earthquake And Subsequent Tsunami” (ML12165A089)
- PRM-72-6, “C-10 Research and Education Foundation, Inc.: Upgrade Interim Dry Cask Storage Code Requirements” (www.regulations.gov, Docket ID: NRC-2008-0649)
- “Rulemaking Revising Security Requirements for Facilities Storing Spent Nuclear Fuel and High-Level Radioactive Waste” (www.regulations.gov, Docket ID: NRC-2009-0558)
- Spent Nuclear Fuel Transportation Security Rulemaking - “Requirements for Physical Protection of Irradiated Reactor Fuel in Transit” (www.regulations.gov, Docket ID: NRC-2009-0163)
- Nuclear Energy Institute Regulatory Issue Resolution Protocol (ML102640080)
- Electric Power Research Institute Extended Storage Collaboration Program: www.epri.com
- Blue Ribbon Commission on America’s Nuclear Future: www.brc.gov

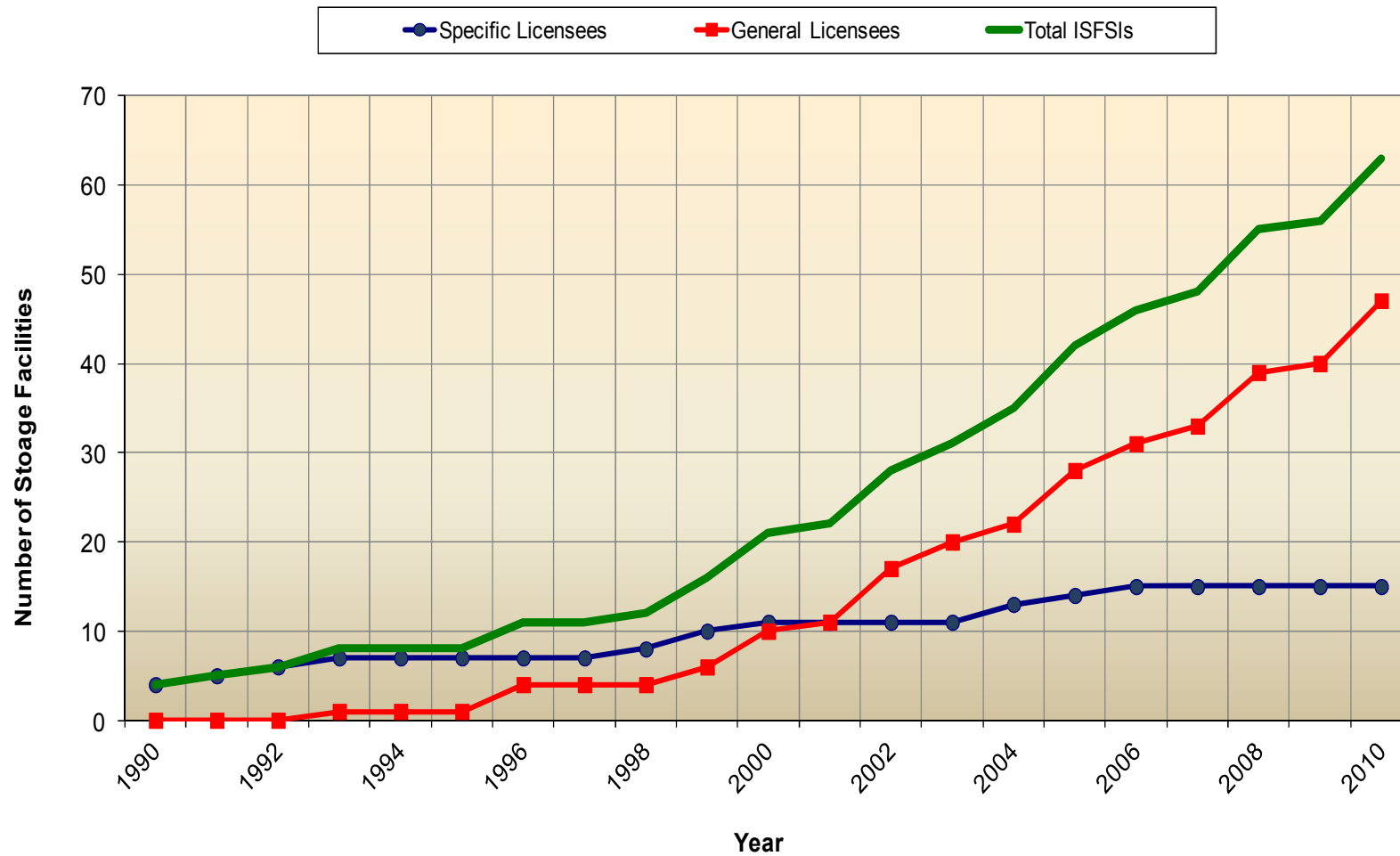
References (cont.)

- *Regulations and Guidance*
 - Title 10 Code of Federal Regulations (CFR) Part 71 “Packaging and Transportation of Radioactive Material”
 - 10 CFR Part 72 “Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater than Class C Waste”
 - Regulatory Guide 3.72 “Guidance for Implementation of 10 CFR 72.48, Changes, Tests, and Experiments”
 - NUREG-1536 – “Standard Review Plan for Dry Cask Storage Systems”
 - NUREG-1567 – “Standard Review Plan for Spent Fuel Dry Storage Facilities”
 - NUREG-1617 – “Standard Review Plan for Transportation Packages for Spent Nuclear Fuel”
 - NUREG-1927 – “Standard Review Plan for Renewal of Spent Fuel Storage System Licenses and Certificates of Compliance”
 - NUREG-1745, “Standard Format and Content for Technical Specifications for 10 CFR Part 72 Cask Certificates of Compliance”
 - “Final Safety Culture Policy Statement” (76 FR 34773; June 14, 2011)

References (cont.)

- Upcoming Stakeholder Interactions
 - September 12 – 13, 2012: Annual SFST Regulatory Conference (<http://www.nrc.gov/public-involve/conference-symposia/2012-spent-fuel-storage-conf.html>)

Growth of Dry Cask Storage



Options for Spent Fuel Storage

- Site Specific License
 - 10 CFR Part 72 Subparts A – J
 - Available to reactor licensees and other entities
 - Opportunity for Hearing
 - License to store and possess spent fuel at single site in U.S.
 - 20-40 year License Terms



Options for Spent Fuel Storage

- General License
 - 10 CFR Part 72 Subparts K-L*
 - Granted to Part 50 and 52 reactor licensees
 - Requires use of certified cask design
 - Certificate application submitted to NRC by a cask vendor
 - Approved design added to Part 72 regulations with the NRC rulemaking process
 - Licensee required to perform site evaluation to verify compatibility of site with design parameters
 - 20 - 40 year certificate terms



Spent Fuel Transportation

- General License
 - 10 CFR Part 71
 - Granted to NRC licensees
 - Requires use of package design certified by NRC
 - Certificate application submitted by vendor to NRC for approval
 - User required to verify that package satisfies design and content specifications in Certificate
 - User required to have NRC approved Quality Assurance Program



Technical Review Guidelines

- Standard Review Plan for Dry Cask Storage Systems (NUREG-1536)
- Standard Review Plan for Spent Fuel Dry Storage Facilities (NUREG-1567)
- Standard Review Plan for Renewal of Spent Fuel Dry Cask Storage System Licenses and Certificates of Compliance (NUREG-1927)
- Standard Review Plan for Transportation Packages for Spent Nuclear Fuel (NUREG-1617)
- Interim Staff Guidance Documents