



# **U.S. NRC Approach to Dry Storage of Spent Nuclear Fuel**

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## Presentation Overview

- Regulatory Background and Framework
- Status of Dry Cask Storage in U.S.
- Licensing – General vs. Site-Specific
- SFST Review Guidance
- Future Challenges

## Regulatory Framework

- Atomic Energy Act of 1954
- 10 CFR Part 72 added in 1980
- Nuclear Waste Policy Act (NWPA) of 1982

Permanent Federal Repository and DOE dry cask storage system

- 10 CFR Part 72

1990 General Licensing for Independent Spent Fuel Storage Installations (ISFSIs)

## Nuclear Waste Policy Act

- Required DOE to accept spent fuel for disposal
- Directed DOE to develop dry storage alternatives for spent nuclear fuel
- Directed NRC to develop a certification process to minimize the need for site-specific NRC approvals

## 10 CFR Part 72

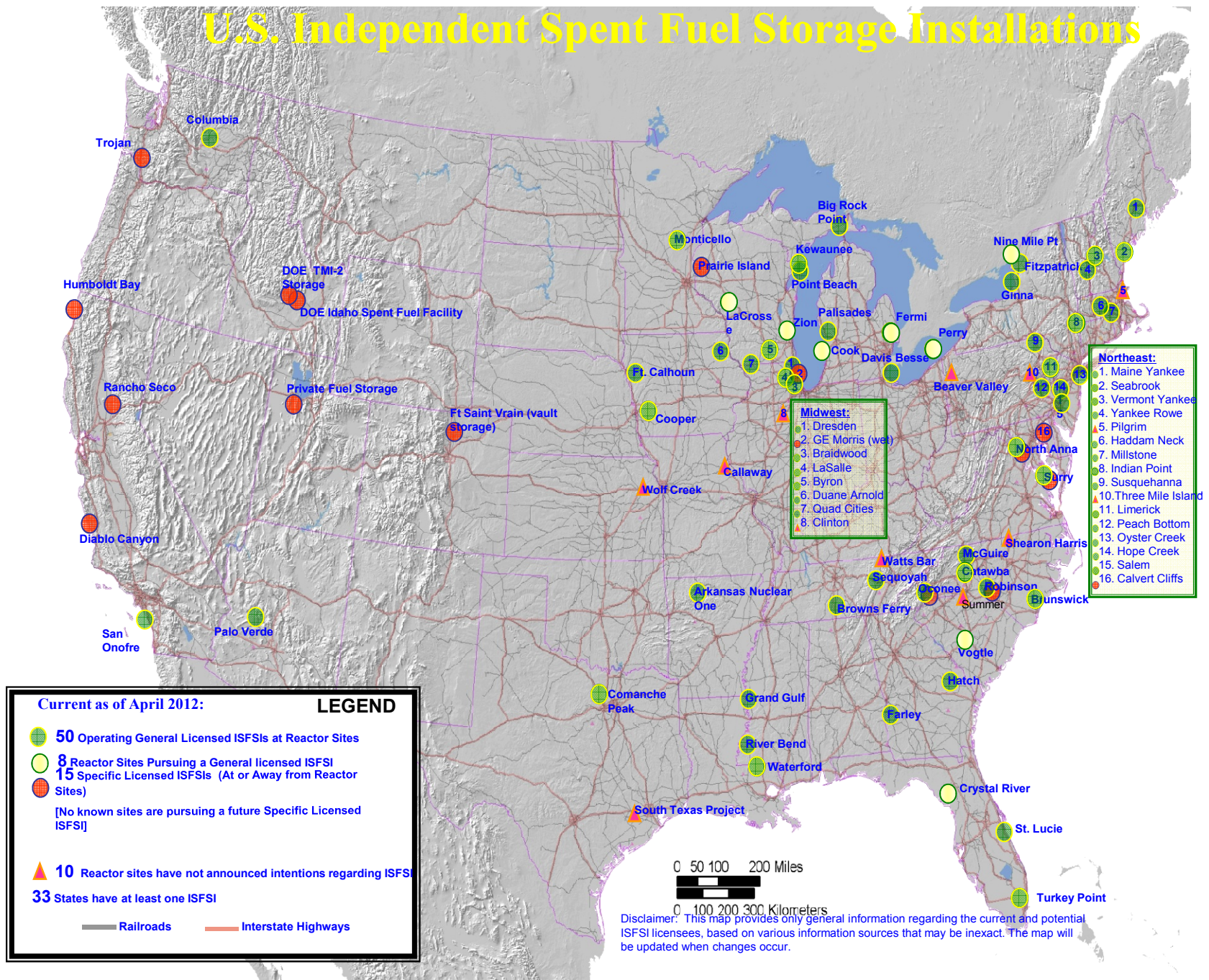
- 1980 - 10 CFR Part 72 issued to address the need for alternative storage methods for spent fuel
- 1990 – General license provisions added, in response to NWPA
- Part 72 addresses wet or dry storage; at-reactor or away-from-reactor ISFSIs

## 10 CFR Part 72

- Requirements for licenses for receipt, transfer, and storage of power reactor spent fuel in an ISFSI
- Requirements for Certificates of Compliance (CoCs) for spent fuel storage cask designs
- 72.13 - Applicability



# U.S. Independent Spent Fuel Storage Installations



# Licensing Process

- Safety Reviews
- Site Specific License
- General License



## Safety Reviews

- Structural
- Thermal
- Shielding
- Criticality
- Confinement
- Materials
- Quality Assurance

## Safety Reviews

- Types of Hazards Considered
  - Off-normal (Unusual) Events
    - Include temperature and pressure extremes and partial air flow blockage
  - Accidents
    - Include earthquakes, fires, floods, lightning, tornado, complete air flow blockage, and cask drop and tip-over

## Site Specific Licensing Process

- Specified in 10 CFR Part 72, Subpart B
- Application Submitted to NRC with Safety Analysis Report and Environmental Report
- NRC Issues Notice of Proposed Action and Opportunity for Hearing
- NRC Prepares Environmental Impact Statement or Environmental Assessment, as appropriate
- Option for Part 50 Licensees
- Required for “Away from Reactor” Sites

# General License Process

## Overview

- Certificate of Compliance Issuance (Rulemaking vs. licensing)
- Reactor Licensee Selection of Dry Cask Storage System, Evaluation of Site (72.212), and Construction of ISFSI
- NRC Inspections

## General License Process

- Certificate of Compliance Issuance
  - Vendor submits an application (SAR) to NRC
  - Application made available for public inspection
  - NRC performs safety review
  - NRC issues a draft safety evaluation report, environmental assessment, and Certificate of Compliance (Rulemaking package)
  - Federal Register Notice of rulemaking published
  - NRC reviews and addresses public comments
  - NRC issues final safety evaluation report and Certificate of Compliance

## General License Process

- **Certificates of Compliance - Use**
  - General license provisions specified in 10 CFR Part 72, Subpart K
  - Limited to Part 50 reactor licensees
  - No application or license issuance
  - Requires use of NRC-certified cask designs

## General License Process

- Part 50 License Holder Actions  
(72.212 evaluations)
  - Performs detailed evaluation to demonstrate that the cask design is compatible with the facility (reviews SAR, SER, & CoC; considers site-specific issues, such as soil properties, tornado missiles, earthquake effects)
  - Conducts dose assessment to demonstrate compliance with the off-site dose limits



## General License Process

- Part 50 License Holder Actions (cont.)
  - Evaluate and modify existing programs to support the ISFSI
    - Quality assurance
    - Physical security
    - Emergency planning
    - Training
    - Health physics
    - Procurement

## General License Process

- Part 50 License Holder Actions (cont.)
  - Inform NRC 90 days prior to first planned loading
  - Register each cask with the NRC within 30 days
  - Maintain individual cask records
  - Maintain casks in accordance with CoC

## Site-specific vs. General License

- Licensing vs. Rulemaking
- Hearing Opportunity for site-specific
- NRC evaluates site characteristics for site-specific license
- Design reviews are similar (specific vs bounding)
- Environmental assessments are different
- Similar inspections

## Part 72 Licensing Documents

- SAR
  - Design basis
  - Not a license requirement and can be changed under 72.48
- SER
  - Staff's technical basis for approval
  - Not a license requirement and cannot be used for enforcement actions
- CoC or SNM License
  - Conditions and Technical Specifications
  - Requirements that must be met by licensee
  - Must be unambiguous for use by inspectors
  - Noncompliance subject to enforcement actions

## Review Guidance

- Standard Review Plans
- Interim Staff Guidance

## Standard Review Plans

- Dry Cask Storage Systems  
(NUREG-1536, Revision 1)
- Spent Fuel Dry Storage Facilities  
(NUREG-1567)
- NUREG-0800 – SRP for LWR licensing
- NUREG-1927 – SRP for License  
Renewals

## Benefits of Standard Review Plans

- Greater Consistency in Licensing Reviews
- Focus on Significant Issues
- Improved Applications from Industry



## Interim Staff Guidance

- Addresses Emergent Review Issues in a Timely Manner
- Documents new staff positions
- Provides opportunity for comment
- Eventually Incorporated Into SRPs

## Future Challenges

- Extended Storage and Transportation (SRM-COMDEK-09-0001)
- Lean Six Sigma of Generic License process (including CoC rulemaking approval process)