

# Industry Petition for Rulemaking PRM 72-7

To improve the effectiveness and efficiency of dry storage regulation

Rod McCullum

NEI

NRC/SFM REG CON 2014

November 19<sup>th</sup>, 2014 • Rockville, MD

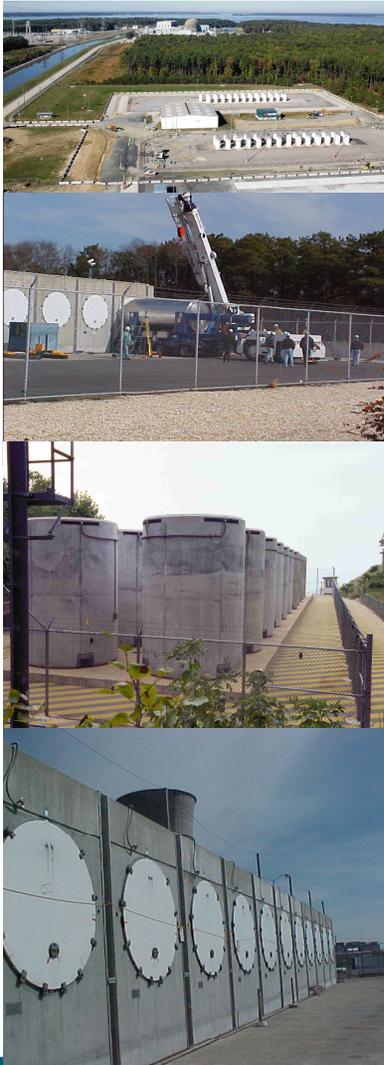
# A challenging journey requires an efficient way to manage the headwinds



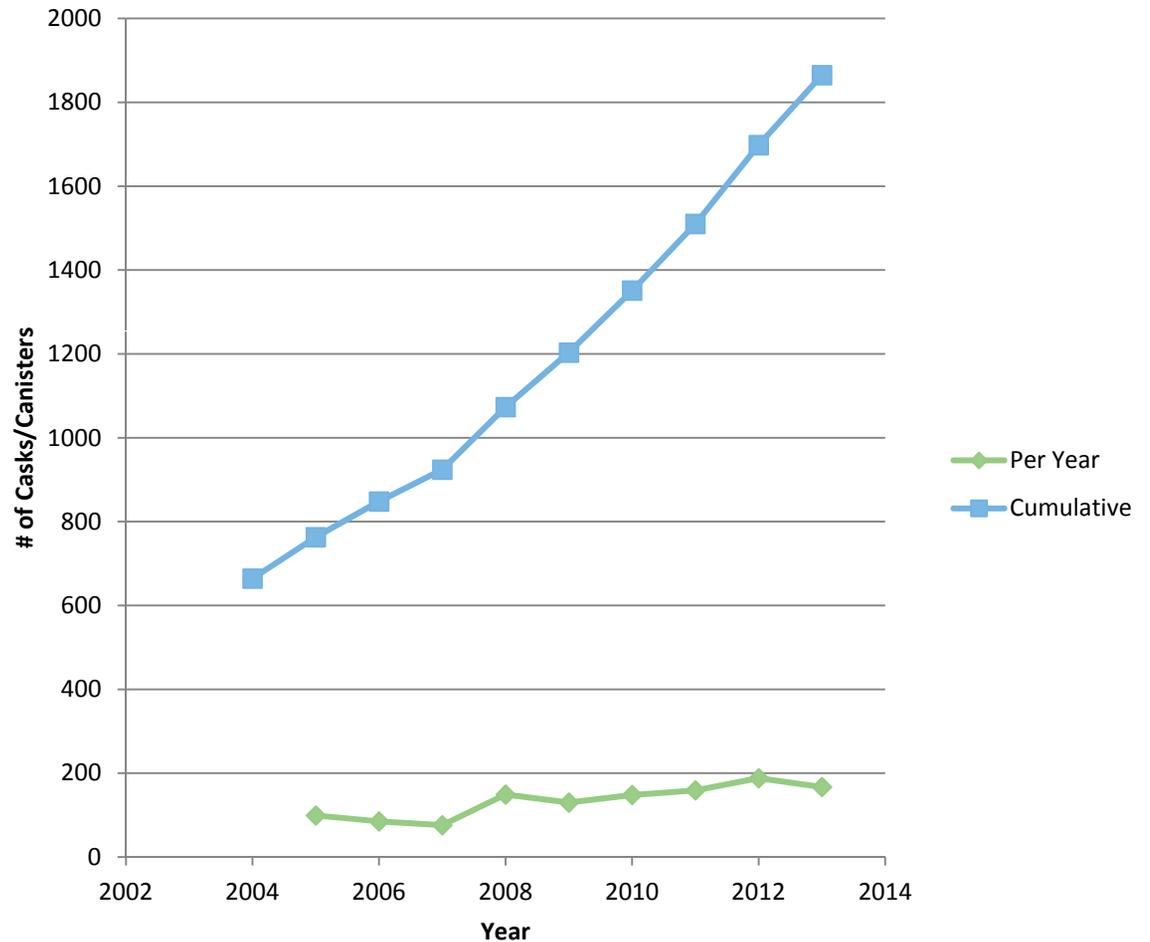
# PRM 72-7 Vision

- Standardize Dry Storage Licenses
  - CoC/Tech Spec Format and Content
  - Level of Detail
  - Consistency with Commission Policy Statement on Improved TS
- Achieve Appropriate Risk Prioritization in Dry Storage Licensing
- Place more information under licensee control
- Extend Back-fit Protection to CoC holders
- Make specific changes to the rule to improve its efficiency

# Historical Growth of U.S. Dry Cask Storage



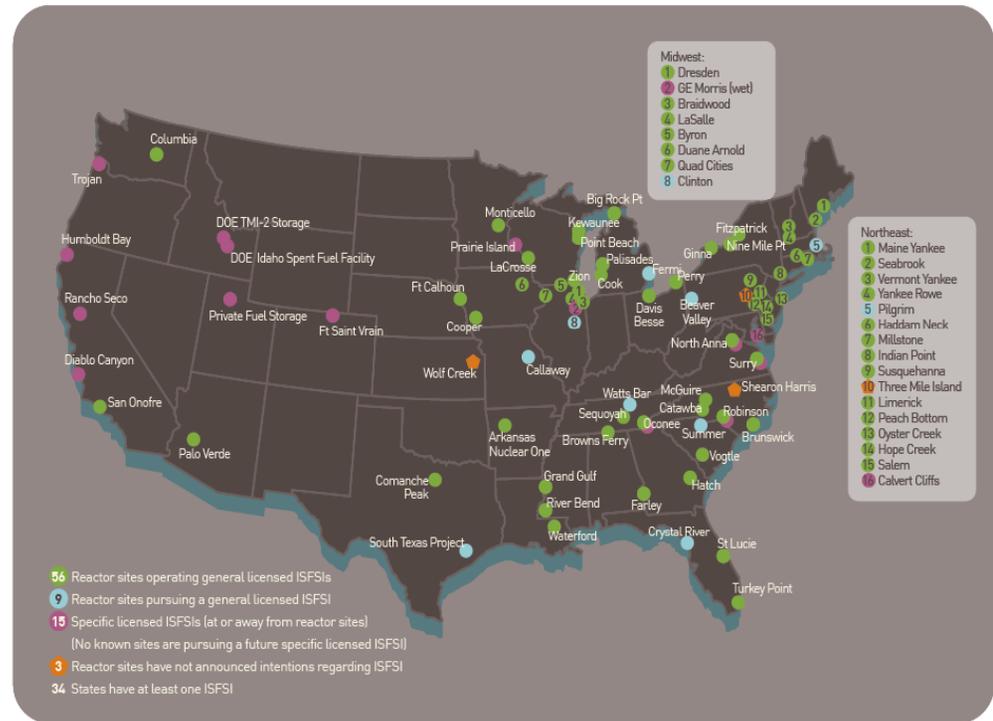
Canisters/Casks in Dry Storage



# Used Nuclear Fuel in Storage in the U.S.

July 2014

- **Used fuel inventory**
  - Approximately 74,000 MTU
  - Increases 2 - 2.4k MTU annually
- **ISFSI\* storage**
  - 83,281 assemblies
  - 23,000 MTU
  - 1,947 casks/modules loaded
  - 64 Operating ISFSIs
    - 1 pool ISFSI, 1 modular vault
- **Projections for 2020**
  - Estimating 88,000 MTU total
  - Estimating 31,000 MTU at ISFSI
  - 3,000 casks/modules loaded
  - At 76 ISFSIs
    - All plant sites + Morris & INEL
  - Fuel from 119 reactors
- **ISFSI Storage will have long-term use**
  - DOE projects consolidated storage 2021-2025, repository 2048



# Dry Storage Licenses and Amendments

- 15 Active Site Specific Licenses
  - Covering 13 actual and 2 proposed ISFSIs
  - 4 of these ISFSIs are now loading under General Licenses
- 14 Active CoCs
  - Being used under General Licenses
  - These CoCs have been amended 54 times
  - One CoC has been amended 13 times
  - Because the original or any amendment may be used, there are 70 different cask licensing bases in effect
  - Approximately 4 additional amendments are pending

# Cumulative Impact

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**NUCLEAR REGULATORY  
COMMISSION**

[Docket No. NRC-2014-0104]

**Agency Information Collection  
Activities: Proposed Collection;  
Comment Request**

**AGENCY:** Nuclear Regulatory  
Commission.

**ACTION:** Notice of pending NRC action to  
submit an information collection

3. *How often the collection is required:* Required reports are collected and evaluated on a continuing basis as events occur; submittal of reports varies from less than one per year under some rule sections to up to an average of about 80 per year under other rule sections. Applications for new licenses, certificates of compliance (CoCs), and amendments may be submitted at anytime; applications for renewal of licenses are required every 40 years for an Independent Spent Fuel Storage Installation (ISFSI) or CoC effective May 21, 2011, and every 40 years for a Monitored Retrievable Storage (MRS) facility.

4. *Who is required or asked to report:* Certificate holders and applicants for a CoC for spent fuel storage casks; licensees and applicants for a license to possess power reactor spent fuel and other radioactive materials associated with spent fuel storage in an ISFSI; and the Department of Energy for licenses to receive, transfer, package and possess power reactor spent fuel, high-level waste, and other radioactive materials associated with spent fuel and high-level waste storage in an MRS.

6. *The number of hours needed annually to complete the requirement or request:* 69,065.7 hours (27,630.7 reporting + 38,683.0 recordkeeping + 2,752.0 third party disclosure).

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60 Years  
STORIED HISTORY  
BRIGHT FUTURE

# Dry Storage License Renewal

## PART 72 CoC EXPIRATION\*

### PART 72 SPECIFIC LICENSE EXPIRATION

SPECIFIC LICENSEE/ISFSI	HBU Fuel?	LICENSE/CoC EXPIRATION
Constellation/Calvert Cliffs**	Yes	2052
Xcel Energy/Prairie Island	Yes	2013*
Dominion/North Anna	No	2018
PGE/Trojan	No	2019
SMUD/Rancho Seco	No	2020
PG&E/Diablo Canyon	Yes	2024
PG&E/Humboldt Bay	No	2025
Dominion/Surry**	No	2046
Progress Energy/Robinson**	No	2046
Duke Energy/Oconee**	No	2050

\* Renewal under review

\*\* Operating in first renewal period

CASK MODEL/CoC	CoC EXPIRATION	CASK USERS
VSC-24	2013**	Palisades, ANO, Point Beach
Standardized NUHOMS/1004	2015	Nine Mile, <u>Ginna</u> , Millstone, Limerick, Oyster Creek, Davis-Besse, Robinson, Brunswick, Oconee, Crystal River, Beaver Valley, Susquehanna, Duane Arnold, Fort Calhoun, Cooper, Monticello, Kewaunee, Palisades, Point Beach,
HI-STAR/1008	2019	Dresden, Hatch
NAC-MPC/1025	2020	Yankee-Rowe, Connecticut Yankee, LaCrosse
HI-STORM/1014	2020	Vermont Yankee, Pilgrim, <u>FitzPatrick</u> , Cook, Fermi, Indian Point, Perry, Dresden, Byron, Braidwood, LaSalle, Quad Cities, Clinton, Columbia, Salem, Hope Creek, Comanche Peak, Palisades, ANO, Grand Gulf, River Bend, Waterford, Hatch, Farley, Vogtle, Sequoyah, Browns Ferry
NAC-UMS/1015	2020	Maine Yankee, McGuire, Catawba, Palo Verde
TN-68/1027	2020	Peach Bottom
TN-32/1021	2020	McGuire
<u>FuelSolutions</u> /1026	2021	Big Rock Point
Advanced NUHOMS/1029	2023	San Onofre
NUHOMS HD/1030	2027	Seabrook, Surry, North Anna, St. Lucie, Turkey Point
MAGNASTOR/1031	2029	McGuire, Catawba, Zion
HI-STORM FW/1032	2031	Sequoyah, Summer, South Texas, Palisades
UMAX/1040	2054 (est.)	Callaway

\* Part 72 general license for all users of the cask under that CoC expires (or is renewed) concurrent with the CoC

\*\* Renewal under review

# PRM 72-7



Anthony R. Pietrangolo  
SENIOR VICE PRESIDENT AND  
CHIEF REGULATORY OFFICER

October 3, 2012

Ms. Annette L. Vietti-Cook  
Secretary  
Attn: Rulemaking and Adjudications Staff  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Subject: Petition to Amend 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"

- 3. Proposed Amendments to 10 CFR Part 72 ..... 7
- 3.1 Add New Rule for Certificate of Compliance Format and Content ..... 7
- 3.2 Revise the Backfit Rule to Apply to CoCs and CoC Holders..... 10
- 3.3 Delete the Requirement for the Review of the Cask SER ..... 11
- 3.4 Clarify the Requirement for the Review of Programs and Plans Governed by Other Parts of the Regulations..... 12
- 3.5 Revise the Requirement for Cask Marking..... 12
- 3.6 Clarify the Applicability of the Criticality Monitoring Exemptions ..... 12



### 3.1 Add New Rule for Certificate of Compliance Format and Content

NEI requests that 10 CFR Part 72 Subpart L be amended to provide specific criteria for the format and content to be included in a spent fuel storage cask Certificate of Compliance (CoC). We believe this is the single-most important near-term regulatory improvement that can be made, as it would provide the largest benefit to regulatory clarity and stability by assuring that the level of detail in CoCs is consistent and risk-informed. This change is also necessary to realize the full benefit of ongoing improvements to the guidance governing implementation of 10 CFR 72.48 and to the inspection program.

# PRM 72-7

#### Proposed rule language for 10 CFR 72

Add a new section "10 CFR 72.237: Certificate of Compliance" with the following rule language:

"(a) Each applicant for a CoC under the general license provision shall include in the application a proposed Certificate of Compliance that includes the Certified Design, Inspections Tests and Evaluations, and Technical Specifications in accordance with the requirements of this section. A summary statement of the bases or reasons for such proposed specifications, other than those covering administrative controls, shall be included in the application, but shall not become part of the Certificate of Compliance.

(b) The Certificate of Compliance will include items in the following categories:

(1) *Certified Design.* Certified Design is implemented by the Certificate Holder and includes:

(i) *Technology.* A concise description of the dry storage system for the purpose of identifying whether future modifications would be considered a significant deviation to the type of technology or included components, or fundamental manner in which the cask system operates, such that modification to these could not be performed through an amendment under 72.244.

(ii) *Design Features.* The design features that would have a significant effect on safety if altered or modified, such as materials of construction and geometric arrangement, would require an amendment under 72.244 in order to modify.

(2) *Inspections, Tests, and Evaluations.* Inspections, Tests, and Evaluations (ITE), and acceptance criteria, that are necessary and sufficient to provide reasonable assurance that, if the ITE are performed and the acceptance criteria met, a cask has been manufactured and will operate in conformance with the certified design, and that the safety functions of confinement, sub-criticality and shielding will be performed. The entity responsible for implementing the ITE (i.e., Certificate Holder or Licensee) will be identified. Documentation that the ITE and acceptance criteria are satisfied is not submitted for NRC review or approval, but shall be available for NRC inspection.

(3) *Technical Specifications.* Technical Specifications are implemented by the licensee and will include the following:

(i) *Limiting Conditions for Operation and Monitoring.* Limiting conditions are the lowest functional capability or performance levels of equipment required for safe operation of

the ISFSI facility and cask. Functional and operating limits for a cask are limits on fuel handling and storage conditions that are found to be necessary to protect the integrity of the stored fuel, to protect employees against occupational exposures and to guard against the uncontrolled release of radioactive materials. Monitoring instruments and limiting control settings for casks are those related to fuel handling and storage conditions having significant safety functions. A technical specification limiting condition for operation of the ISFSI facility or cask must be established for each item meeting one or more of the following criteria:

(A) *Criterion 1.* Installed instrumentation that is used to detect, and indicate a significant abnormal degradation of the cask confinement boundary;

(B) *Criterion 2.* An initial condition of a design basis accident that either assumes the failure of or presents a challenge to the integrity of a fission product barrier;

(C) *Criterion 3.* A structure, system, or component which operating experience or risk considerations have been shown to be significant to public health and safety.

(ii) *Surveillance Requirements.* Surveillance requirements are those that confirm the limiting conditions for operation and monitoring are met.

(iii) *Approved Contents.* Approved contents are the minimum set of parameters defining the contents approved for storage in the certified design that would have a significant effect on safety if altered or modified. Information in the Approved Contents section of the technical specifications must meet one or more of the following criteria:

(A) *Criterion 1.* The characteristic or parameter is identified in 10 CFR 72.236(a);

(B) *Criterion 2.* A characteristic or parameter for which verification is a necessary condition to provide reasonable assurance that the cask safety functions of confinement, sub-criticality, and shielding will be performed;

(C) *Criterion 3.* A characteristic or parameter which operating experience or risk considerations have been shown to be significant to ensure public health and safety.

(iv) *Administrative Controls.* Administrative controls include the organization and management of procedures, recordkeeping, review and audit, and reporting requirements necessary to assure that the operations involved in the storage of spent fuel and reactor-related GTCC waste in an ISFSI are performed in a safe manner.

(c) A Certificate Holder is not required to propose to modify any Certificate of Compliance approved before *{DATE TBD}*, to satisfy the requirements in paragraph (b) of this section but may choose to do so at any time."

# PRM 72-7 – Moving Forward with the Vision

Federal Register / Vol. 79, No. 138 / Friday, July 18, 2014 / Proposed Rules

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## NUCLEAR REGULATORY COMMISSION

### 10 CFR Part 72

[Docket Nos. PRM-72-7; NRC-2012-0266;  
NRC-2014-0067]

### Spent Fuel Cask Certificate of Compliance Format and Content

**AGENCY:** Nuclear Regulatory  
Commission.

**ACTION:** Petition for rulemaking;  
consideration in the rulemaking  
process.

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**SUMMARY:** The U.S. Nuclear Regulatory  
Commission (NRC) will consider in its

rulemaking process six issues raised in  
a petition for rulemaking (PRM), PRM-  
72-7, submitted by Anthony  
Pietrangelo, on behalf of the Nuclear  
Energy Institute (NEI or the petitioner).  
The petitioner requests that the NRC  
amend its regulations to improve the  
efficiency of the licensing and oversight  
of spent fuel dry cask storage.

The NRC published a notice of receipt of the petition and request for public comment in the **Federal Register (FR)** on February 5, 2013 (78 FR 8050). After analyzing the issues raised in the petition and reviewing the public comments, the NRC concludes that the issues are appropriate for rulemaking consideration.

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Years  
STORIED HISTORY  
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# Keys to Assuring Safety with More Information Under Licensee Control

- 10 CFR 72.48 Change Process
  - NRC and Industry must have confidence in and a common understanding of process
    - Industry submitted 72.48 guidance (NEI 12-04) in September 2012 to supersede guidance in NEI 96-07, Appendix B once endorsed.
- Aging Management Programs
- NRC Inspection Programs

## Also Important to PRM 72-7 Implementation

- Retrievability
  - Framework for retrievability should focus on the dry storage system to perform the safety function, with cladding as defense in depth
  - Technologies exist today to handle fuel with gross ruptures or structural defects.
  - Consideration of potential DOE activities is inappropriate and unnecessary to provide reasonable assurance
  - A revised performance-based and risk-informed definition for “canister-based” retrievability needs to be established.

# Summary

- There are significant and timely opportunities to create efficiencies in dry storage licensing by implementing a risk-informed basis.
- Efficient dry storage licensing processes are essential for effective management of the growing and aging dry storage cask population
- PRM 72-7 is fundamental to the regulatory reform needed to assure an effective and consistent industry approach.



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