

Licensing Efficiency – Important to Safety

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US NRC REG CON

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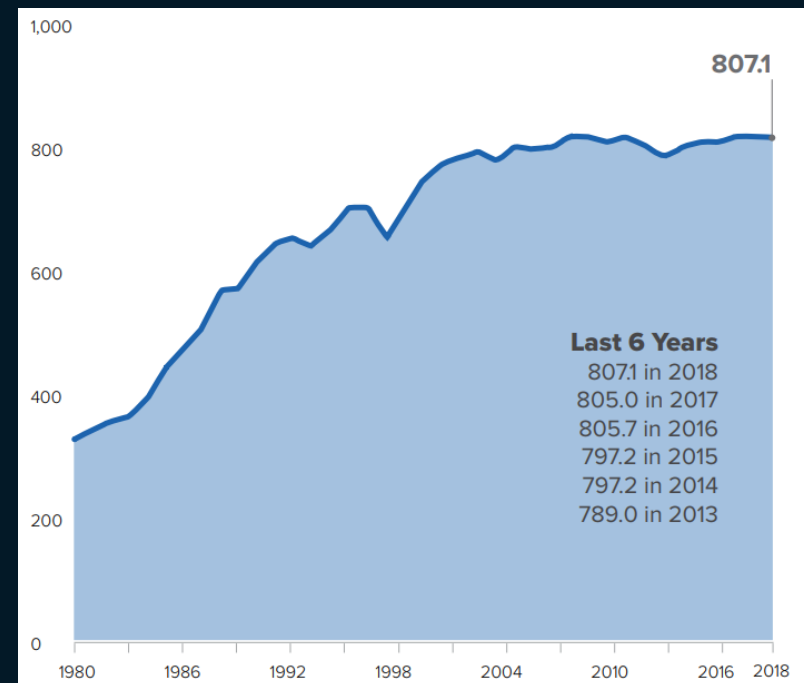
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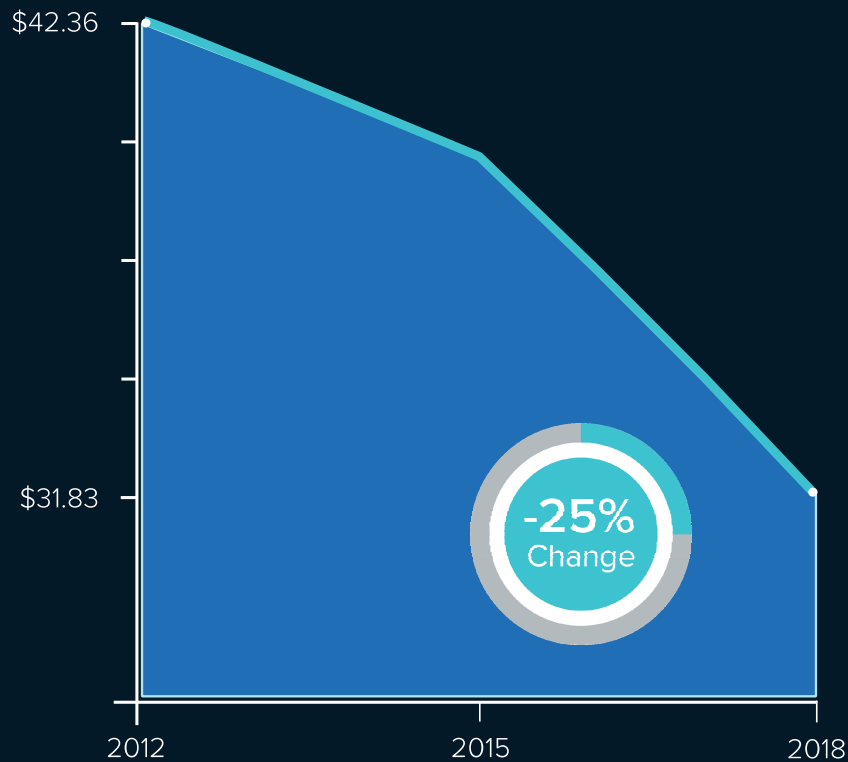


Nuclear Electricity – more than ever

U.S. Nuclear Power Plants

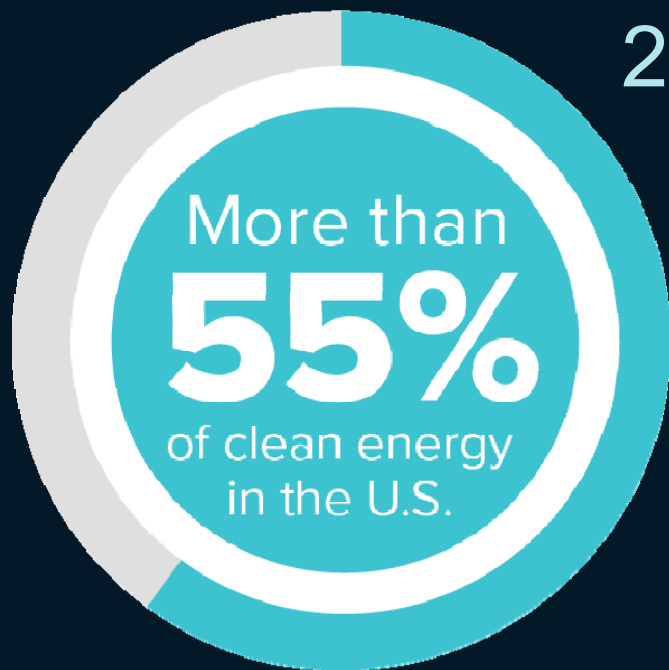
- 98 reactors across 59 sites
- 99,355 megawatts-electric of baseload capacity
- 807.1 billion kilowatt-hours in 2018
- 92.3 percent capacity factor in 2018





Total U.S.
Nuclear Plant
Generating Costs
In Dollars per Megawatt-Hour
-25% Change From 2012-2018

2018 Nuclear Share of U.S. Emissions-Free Energy



**Social Cost of CO₂, NO_x, & SO₂
avoided by Nuclear = \$28.1 B/yr.**

Used Fuel in the U.S.

Used fuel inventory*

Approximately 82,500 MTU
Increases 2 - 2.4k MTU annually

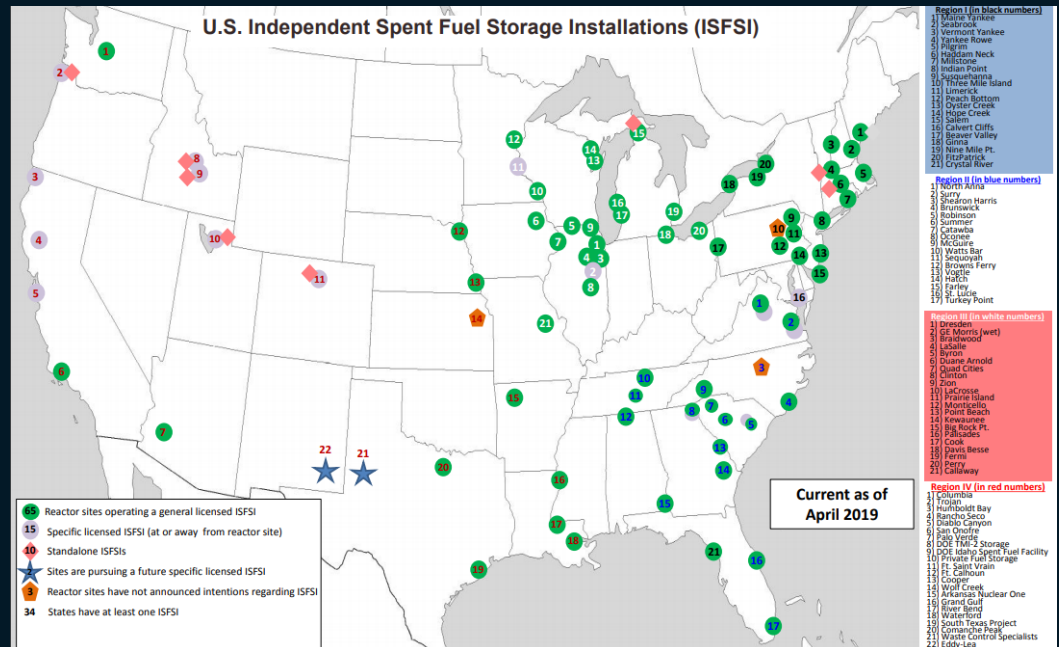
ISFSI** storage

134,843 assemblies
38,200 MTU (46%)
3,069 casks/modules loaded
73 Operating ISFSIs
72 dry storage, 1 pool
Eventually to be deployed at 76 sites
Fuel from 119 reactors

Long term commitment to ISFSIs

Licenses being extended to 60 years
Licenses extensions approved at 30 sites

Efficiency will be key to future success



*As of June, 2019

** ISFSI = Independent Spent Fuel Storage Installation

NRC's Principles of Good Regulation

January 17, 1991

- Independence
- Openness
- **Efficiency**
- Clarity
- Reliability

Efficiency:

The American taxpayer, the rate-paying consumer, and licensees are all entitled to the best possible management and administration of regulatory activities. The highest technical and managerial competence is required, and must be a constant agency goal. NRC must establish means to evaluate and continually upgrade its regulatory capabilities. Regulatory activities should be consistent with the degree of risk reduction they achieve. Where several effective alternatives are available, the option which minimizes the use of resources should be adopted. Regulatory decisions should be made without undue delay.

But this is not efficiency...

- Over the last 25 years the 15 NRC approved dry storage Certificates of Compliance (CoCs) have been amended 74 times. Preparation of Amendments requires between two and nine months of effort on the CoC holders part and one to three years of review at NRC – although in a few cases it has taken considerably longer. The process typically involves two rounds of Requests for Additional Information (RAIs) from NRC. Staff can also issue Requests for Supplemental Information and Requests for Clarification. Normally NRC asks between one and two dozen RAIs with many RAIs having multiple subparts.
- It is not unusual for a single dry storage facility to have between 2 and 7 distinct and different sets of licensing documentation for casks that are essentially identical

The Cost of Inefficiency ?

- Assumption: A CoC amendment costs about the same as a decommissioning plant license amendment or exemption
 - This may **or may not** be a valid assumption
- Fact: Decommissioning licensing actions are costing between \$1.75M and \$4.5M each (~55% of this is NRC review costs)
- At the same unit cost, 74 CoC amendments would have cost between \$130M and \$330M
- How much of this was really necessary to assure safety?
- And **money is not the point** – what we are measuring in dollars are the highly skilled human resources of limited availability we are diverting away from things that are more important to safety

What we are doing to improve efficiency

- Improving the usability of the 10 CFR 72.48 change control process (NEI 12-04) so that things that are not important to safety do not consume licensing resources
- Implementing highly effective CoC/license renewal guidance (NUREG 1927 Rev 1, MAPS Report, NEI 14-03) so that long-term dry storage can be managed in a stable and predictable manner
- Piloting a graded approach CoC (RIRP-I-16-01) to reduce unnecessary licensing burden by ~34%
- **Better understanding dry storage safety margin to identify further opportunities for improvement**

Why Understanding Margin is Important

- Memorandum from NMSS Director Mark Dapas to NMSS Staff 1/15/2019
 - *“Reviewers should consider the relative margin to any applicable regulatory limits pertaining to the item under review. If the licensee or applicant has reasonably demonstrated that there is significant margin from the regulatory limits, then a detailed review of the item may not be warranted beyond confirming the adequacy of the licensee’s or applicant’s models, codes, and/or approach, including any key parameters and assumptions, used to demonstrate that significant margin exists.”*
 - *“Regulatory standards should already include the appropriate margin the Commission previously deemed necessary to provide for adequate protection. There is no requirement or expectation for additional margin beyond these regulatory standards, even if additional margin is reflected in any “acceptance criteria” contained within guidance documents.”*

Understanding Enables Transformation

Foundational Enablers

Industry
Maturity

Strong
Performance

Understanding
of Safety Margin

Increased
Focus on
Safety
Significance

Transformative Elements

Disposition Low
Safety Significant
Issues Quickly

Implement Graded
Reasonable/High
Assurance Standards

Implement
Performance-based
Inspection

Conclusion

- A better understanding of dry storage performance margin is a missing puzzle piece needed to complete an efficient approach to assuring long term dry storage safety
- Completing the puzzle will bring about transformative change
- Later this year industry will be submitting to NRC a White Paper seeking to advance this goal
- Bob Quinn will describe the White Paper tomorrow afternoon in REG CON Track V
 - In other words “when Quinn the Eskimo gets here, everybody's gonna jump for joy” – *Bob Dylan, the Mighty Quinn*

