

Calvert Cliffs ISFSI License Renewal

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Presentation Overview

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ISFSI Licensing: Site Specific vs General License

- Site-Specific License
 - Issued to specific site (station) under 10 CFR 72
 - Includes site-specific Tech Specs; station maintains the SAR
 - The station renews its Part 72 license
 - License renewal application 2 years prior to license expiration
- General License
 - Cask vendor holds the approved storage cask Certificate of Compliance (CoC) under 10 CFR 72, maintains the SAR
 - Part 50 licensees use the approved storage cask as Part 72 general licensees, and must comply with the CoC
 - The CoC holder (vendor) applies for renewal of the storage cask
 - License renewal application 30 days prior to CoC expiration



License Renewal

- One of the tenants of license renewal since issuance of **10 CFR 54** (Requirements for Renewal of Operating Licenses for Nuclear Power Plants) is the **continued adequacy of the current design basis for the renewal period.**
- **NUREG-1927** (Standard Review Plan for Renewal of Spent Fuel Dry Cask Storage System Licenses and Certificates of Compliance) **Section 2.3 echoes this:**

"The NRC bases a license or CoC renewal on the *continuation of the existing licensing basis throughout the period of extended operation* and on the maintenance of the intended functions of the SSCs important to safety. The NRC does not intend a license or CoC renewal to be a vehicle for imposing new regulatory requirements ..."

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Exelon Dry Cask Storage

- Exelon Generation Company manages eleven (11) ISFSI facilities
 - Five facilities in Illinois
 - Two facilities in Pennsylvania
 - Two facilities in New York
 - One facility in Maryland
 - One facility in New Jersey
- Exelon Generation has one (1) ISFSI facility under construction in Illinois
- Exelon Generation will take possession of the Zion ISFSI facility in Illinois after the site is decommissioned
- *Calvert Cliffs is the only Exelon facility with a site-specific license*

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Calvert Cliffs



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Calvert Cliffs ISFSI

- 76 Filled Dry Casks on the ISFSI Pad
 - 48 NUHOMS 24P
 - 28 NUHOMS 32P



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Calvert Cliffs ISFSI – Transfer Cask



8 Exelon DCS 2012 Campaign Summary



Calvert Cliffs ISFSI – Preparing to Load DSC Into HSM



Exelon DCS 2012 Campaign Summary



Calvert Cliffs - ISFSI History

- **Nov 1992** – Received site-specific license (SNM-2505), for 20 years
 - NUHOMS-24P design (Nutech/Pacific Nuclear/Vectra/Transnuclear) ... Dry Shielded Canisters (DSCs) placed into Horizontal Storage Modules (HSMs); 24 PWR fuel assemblies
 - Initial 48 HSMs poured-in-place (facility originally designed for 120)
- **Nov 1993** – First 24P loading
- **2000 - 2001** – Added 24 more poured-in-place HSMs
- **2005** – 32P DSC license amendment, first 32P loading
 - 32 PWR fuel assemblies in each DSC
 - No changes to HSMs, no equipment changes
- **2010** – “32P+” license amendment
 - Licensed increase in 32P burn-up limit from 47 to 52 GWd/MTU
 - No design change to the 32P DSC

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Calvert Cliffs - ISFSI History (continued)

- **Sep 2010** – Submitted application for ISFSI license renewal
 - 20-year license to expire Nov 2012
 - At least 2 years before the expiration of existing license, per 72.42(b)
- **2012** – Performed lead canister inspections for license renewal
- **2013** – Installed 24 pre-fabricated HSMs (HSM-HB)
- **2014** – Submitted License Amendment Request for 32PHB DSC
 - Allows higher burnup (to 62 GWd/MTU) and initial enrichment (up to 5%)
 - Allows higher heat load (up to 29.6 kW)
 - Increases licensed facility capacity from 120 to 132 HSMs
- **Oct 23, 2014** – NRC issues renewed ISFSI license

Currently have forty-eight (48) 24P and twenty-eight (28) 32P DSCs loaded

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Calvert Cliffs - ISFSI License Renewal History

- The original 20-year ISFSI license was to expire on November 30, 2012
- License Renewal Application (LRA) was submitted on September 17, 2010 (40-year extension)
 - NRC acceptance questions (10) received Dec 2010; answered Feb 2011
 - NRC 1st set of RAIs (23) and Environmental Report questions (6) received Apr 2011; answered Jun 2011
 - Maryland Department of Natural Resources questions (6) received May 2011; answered Aug 2011
 - NRC 2nd set of RAIs (9) received Oct 2011; answered Dec 2011
 - Lead canister inspection performed at Calvert in Jun 2012, report submitted Jul 2012

12 Exelon OCS 2012 Damage Summary



Calvert Cliffs - ISFSI License Renewal History (cont)

- NRC 3rd set of RAIs (3) received Oct 2012, answered Apr and Jun 2013
- NRC 4th set of RAIs (15, most related to AMP) received Jun 2014; answered Sep 2014
- D.C. Circuit Court had vacated NRC Waste Confidence Decision, June 2012, resulting in no licenses being issued
- NRC published new Continued Storage of Spent Nuclear Fuel Rule (replacing the Waste Confidence Rule), effective October 20, 2014
- NRC issued renewed ISFSI license for Calvert Cliffs on October 23, 2014 ... expires November 30, 2052

13 Exelon DCS 2012 Campaign Summary



Lead Canister and EPRI Canister Inspections

- Day 1 (June 27, 2012)
 - Lead canister (HSM-15) Visual Inspection through Rear Outlet Vent
 - EPRI Canister (HSM-1) Visual Inspection through Rear Outlet Vent
- Day 2 (June 28, 2012)
 - Raise HSM-15 Door 2-feet for Lead Canister
 - Perform Temperature Measurement on DSC Bottom End
 - Perform Visual Inspection of DSC Bottom End, HSM Doorway and Seismic Restraint
 - Replace and Re-weld HSM-15 Door
 - Remove HSM-1 Door for EPRI Canister
 - Perform Temperature Measurement on DSC Bottom End
 - Perform Visual Inspection of DSC Bottom End, HSM Doorway and Seismic Restraint
 - Install Radiation Shield
 - Move scaffold in front of HSM-1
 - Perform Temperature Measurements on Upper DSC Shell
 - Perform Salt Measurement and Dust Sample Collection on Upper DSC Shell
 - Remove HSM Radiation Shield
 - Replace and Re-weld HSM-1 Door

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Canister Inspection



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Canister Inspection



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ISFSI License Renewal Process Reflections

Success due to collaborative efforts over many years...

Determination of required information in the Aging Management Programs (AMPs)

- Use of the current plant programs
- Recognition of plant license renewal aging management programs

Learning Aging Management Programs

- "Toll Gate" concept
 - Chloride Induced Stress Corrosion Cracking
 - High Burn-up Fuel Storage

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Looking to the Future

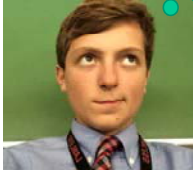
- High burn-up demonstration implementation
- Additional canister inspection NDE techniques
 - Calvert Cliffs ISFSI canister inspections
- Design criteria to address inspection results as needed
 - ASME code development effort
- Chloride Induced Stress Corrosion Cracking (CISCC) inspection frequencies informed by flaw growth potential
- NEI, EPRI and NRC documents and revisions
- Guidance document development and revision
- Calvert Cliffs ISFSI licensed to November 2052

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Thank you for your attention

Safely Stored Awaiting Transport



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