The Interim Storage of Spent Nuclear Fuel

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Office of Nuclear Material Safety and Safeguards
Questions of Interest

Why do we need Interim Storage?
Can we safely store our nations spent fuel?
What is the NRC's role in the storage process?
What storage systems are available?
What storage systems are on the horizon?
Why Do We Need Interim Storage?

- The capacity of the fuel pools is finite.
  - Based on DOE projections 26 facilities will need some form of increased capacity prior to the year 2000
  - The DOE proposes to start receiving fuel by 1998
What are the options for Interim Storage?

- Three options currently exist for licensees
  - Increase the capacity of the existing fuel pool
  - Transshipment of fuel to another facility
  - Acquire an Independent Spent Fuel Storage Installation
Can we safely store our nations spent fuel?

- Waste Confidence Decision of 1984/1989
- Pessimistic Assumptions
  - Yucca Mtn. Dropped in 2000
  - Prolonged Wet / Dry Storage
- Storage Safe for at least 100 years
  - 40 yrs Operation
  - 30 yrs License Renewal
  - 30 yrs Post Shutdown
What is the NRC's Role in the Storage Process?

- Licensing of the Technologies of Spent Fuel Storage
  - Issuing a Certificate of Compliance
  - Approval of Topical Report
- Licensing the Actual Storage of Spent Fuel
  - Site Specific License
  - General License
General objectives of the licensing Process

- Safe confinement of the spent fuel
- Prevent degradation of the fuel cladding
- Compatibility with transportation
  - Reload at the fuel pool
  - Reload Separately
  - Dual Purpose Certification
Licensing of Independent Spent Fuel Storage

• Site Specific License
  – Direct Review or
  – Topical Report Approval

• General License
  – Available to Part 50 Licensees
    • System must have a Certificate of Compliance
    • Conditions for use must be satisfied
Overview of the General License

- General License issued to power reactor licensee for storage of spent fuel in NRC-approved casks
- Safety requirements of 10 CFR Part 72 remain in effect
- Current safeguards requirements of 10 CFR Part 73 for fixed sites remain applicable
- Rule approved four cask designs
- New cask designs to be added by rulemaking
Certificate of Compliance

- 20 year renewable certificate
  - Casks manufactured under a Certificate of Compliance may be used for 20 years (longer if certificate renewed)
  - Description of cask and references to appropriate drawings
What Storage Systems Are Available Today?

- Steel "Storage Only" Casks
  - NAC-C28 S/T
  - NAC-S/T
  - MC-10
  - CASTOR V/21
  - TN-24
    (under review)

- Modular Vault Dry Storage
  - Foster Wheeler

- Concrete and Steel "Storage Only"
  - NUHOMS 52 B
    (under review)
  - NUHOMS 7P / 24P
  - VSC 24
    (under review)
NUHOMS Horizontal Storage Module (HSM)
NUHOMS Dry Shielded Canister (DSC)

- Top Shield Plug and Cover Plate
- Support Rod
- Guide Sleeve
- Spacers
- Basket Assembly
- Grapple Ring
- Bottom Shield Plug
- Bottom Cover Plate

*Fixed Poison Material Used for Channelled BWR Fuel
Modular Vault Dry Storage (MVDS)
What Storage Systems are on the Horizon?

- Dual Purpose Casks
  - Stainless Steel
  - Concrete Container and Steel Multi Element Canister
- Multi Purpose Casks
  - Storage, Transport, and Disposal
## Licenses Issued

<table>
<thead>
<tr>
<th>Reactor Site</th>
<th>Docket &amp; License</th>
<th>Model</th>
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</thead>
<tbody>
<tr>
<td>Surry Power Station</td>
<td>72-2; SNM-2501</td>
<td>Castor V/21</td>
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<td>NAC-128 S/T</td>
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<td>H. B. Robinson</td>
<td>72-3; SNM-2502</td>
<td>NuHoms-7P</td>
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<tr>
<td>Oconee Nuclear Station</td>
<td>72-4; SNM-2503</td>
<td>NuHoms 24P</td>
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<tr>
<td>Fort St. Vrain</td>
<td>72-9; SNM-2504</td>
<td>MVDS</td>
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<td>Calvert Cliffs</td>
<td>72-8; SNM-2505</td>
<td>NuHoms 24P</td>
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# License Applications Received

<table>
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<tr>
<th>PLANT SITE</th>
<th>DOCKET NO.</th>
<th>SYSTEM</th>
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<tbody>
<tr>
<td>BRUNSWICK</td>
<td>72-6</td>
<td>NUHOMS-7P</td>
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<tr>
<td>PALISADES</td>
<td>72-7</td>
<td>VSC-24</td>
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<td>[WITHDRAWN 8/90]</td>
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<td>PRAIRIE ISLAND</td>
<td>72-10</td>
<td>TN-40</td>
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<td>RANCHO SECO</td>
<td>72-11</td>
<td>NUHOMS Dual Purpose</td>
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## Applications for Certificate

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<tr>
<th>VENDOR</th>
<th>MODEL</th>
<th>DOCKET NO.</th>
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<tr>
<td>PACIFIC NUCLEAR FUEL SERVICES, INC.</td>
<td>NUHOMS-24P</td>
<td>72-1004</td>
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<td>NUHOMS-52B</td>
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<td>TRANSNUCLEAR</td>
<td>TN-24</td>
<td>72-1005</td>
</tr>
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<td>B&amp;W FUEL COMPANY</td>
<td>CONSTAR-32</td>
<td>72-1006</td>
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<td>PACIFIC SIERRA NUCLEAR ASSOCIATES</td>
<td>VSC-24</td>
<td>72-1007</td>
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</table>
## Topical Reports Under Review

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Model</th>
<th>Capacity</th>
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<tbody>
<tr>
<td>GENERAL NUCLEAR SYSTEMS, INC.</td>
<td>CASTOR X</td>
<td>28 PWR or</td>
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<td>METAL CASK</td>
<td>33 BWR</td>
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<td>NAC-STC</td>
<td>26 PWR</td>
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<td>DUAL PURPOSE METAL CASK</td>
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</table>
Spent Fuel in Dry Storage
Total Number of Assemblies

Ft. Saint Vrain
1482 Elements

Surry
252

Oconee
96

H.B. Robinson
56

Source:
SR/CNEAF/92-01

5 January, 1993