Extended Dry Storage and Transportation

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NEI Used Fuel Management Conference

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Aging management to assure long term performance

- **Focus on ensuring primary safety functions***
  - **Criticality control, confinement/containment and shielding**
- **Focus on components providing safety functions**
  - **Canister/cask and transport package**
    - Primary for confinement/containment,
    - Can provide criticality control
  - **Concrete storage module**
    - Shielding
  - **Canister/cask internals and fuel**
    - Defense-in-depth for confinement, criticality
- **Focus on activities to provide assurance**
  - **Monitoring**
  - **Inspection**
  - **Mitigation**

*Other function, such as thermal and structural are important, but not primary safety functions

Align ability to perform aging management and components providing safety functions

	Providing safety function	Ability to monitor	Ability to inspect	Ability to mitigate
Canister/cask	High	High	High	High
Concrete module	Med	High	High	High
Fuel, Internals*	Low	Low	Low	Low

*Aging management on fuel and internals requires opening the canister, resulting in unnecessary risk

Long term aging mechanisms of most concern

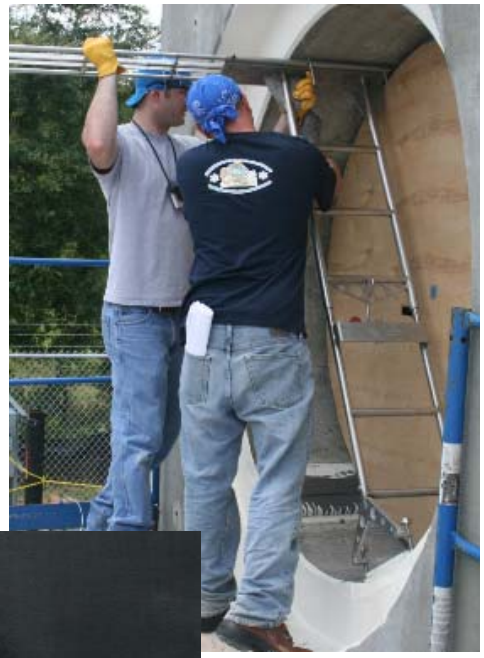
- **Canister**
  - **Chloride induced stress corrosion cracking (CISCC)**
    - Requires sufficient salt, moisture and stress
    - Proven to occur in laboratory, thresholds not fully established
    - Actual field conditions relatively unknown
- **Concrete modules**
  - **Behavior under radiation and higher temperatures (cracking, spallation, etc)**
- **Fuel and internals**
  - **High burn-up fuel (hydride re-orientation)**

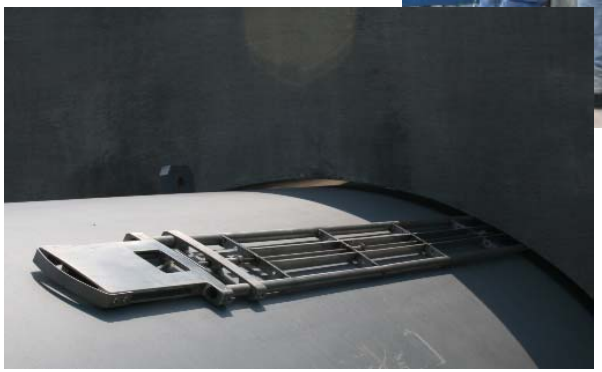
TN activities on canisters for coastal marine sites

- **Current designs**
  - **TN coastal sites in the US**
  - **316L DSC currently in operation**
- **Potential design improvements**
  - **SCC resistant material**
  - **Remove tensile stress on surface**
  - **SCC inhibiting coatings**

TN activities on canister inspection techniques

- **TN has developed the Salt Smart Tool**
  - **An innovative measurement technology to determine the amount of salt on the exterior of DSCs**
  - **Can determine if location/canisters are at risk and if preventive measures are warranted**
  - **First measurement at Calvert Cliffs NPP in the summer 2012**
  - **Recipient of 2013 TIP Award**





Additional TN Activities

- **Concrete**
  - **Enhanced concrete mixes**
    - Improved resistance to impact and to cracking for long term storage
  - **Determine impacts of potential degradation**
  - **Assess feasibility of replacing if necessary**

- **Fuel and internals**
  - **High burn-up data collection project**
    - Validate characteristics and performance of fuel
  - **Participating in discussion on retrievability and clad integrity**
    - Risk based, defense-in-depth role

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