

#### NRC Amendment Applications Public Meeting (Closed Session – 9:30am 'till 3:00pm)

Date: December 12, 2013 Docket Nos.: 71-9225, 71-9235, and 72-1031

## Agenda

- Detailed technical discussions of current amendment applications
  - NAC-STC WVDP-HLW and uncanisterized HBU fuel
  - MAGNASTOR Amendment 5
  - NAC-LWT HEUNL
- Closing remarks and discussion of any follow-up items



## **NAC-STC Application (WVDP-HLW)**

- Key aspects of application
  - No modification made to cask body or lids
  - Revised cask cavity spacers position the overpack (i.e. TSC) in the cask body to:
    - Place overpack in an area of the cask body that provides the greatest radiation shielding
    - Retain center of gravity of previously evaluated and approved payloads



## NAC-STC Application (WVDP-HLW) (cont.)





## NAC-STC Application (WVDP-HLW) (cont.)

- No criticality evaluation performed since the quantity of fissile material is below 10 CFR Part 71 exemption limits
- The vitrified HLW glass matrix traps fissile material and any volatiles/gases that were released during reprocessing and glass formation
  - Cask body retained as leak tight boundary
  - No significant pressurization seen at leak tight boundaries
- Low heat load (< 2 kW per loaded overpack) and low radiation sources relative to previously approved STC payloads
  - Analyses demonstrate component temperatures are well below allowables
  - Dose rates are not significant relative to limits (e.g. < 1 mrem/hr. at 1 meter)



# NAC-STC Application (WVDP-HLW) (cont.)

- Structural evaluations demonstrate that total weight and distribution is bounded by previously evaluated and approved payloads
  - Empty positions will be loaded with transport insert
- Due to the loading geometry and dimensions of the HLW canisters, they retain their position through all loading conditions
- Either Redwood or Balsa impact limiters may be used



## **NAC-STC** Application (HBU Fuel)

- Key Aspects of High Burn-up Fuel
  - PWR 17x17 fuel, burnup from 45,000 60,000 MWd/MTU can be directly loaded into the STC without being placed in a damaged fuel can





# NAC-STC Application (HBU Fuel) (cont.)

• Key Aspects of Increased Heat Load



 Basket tube design modified as an alternate basket to accommodate a slightly thicker MMC poison material



## NAC-STC Application (HBU Fuel) (cont.)







## NAC-STC Application (HBU Fuel) (cont.)





#### **MAGNASTOR Amendment 5 Application**



#### **MAGNASTOR** Amendment 5 Application (cont.)

**NAC** INTERNATIONAL



# **MAGNASTOR Amendment 5 Application (cont.)**

• Application may potentially include





## **NAC-LWT HEUNL RAI Responses**

- General overview before lunch
- Detailed review after lunch



## NAC-LWT HEUNL RAI Responses (cont.)

- General overview
  - In response to NRC RAIs, NAC revised several areas of the initial application
  - Areas primarily affected are those involving:
    - Material behavior as function of temperature (freezing) and resulting structural impacts
    - Corrosion
    - Gas generation
  - Minor modifications made to criticality evaluations
  - No RAIs on shielding; no revisions made



#### **NAC-LWT HEUNL RAI Responses (cont.)**





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### **NAC-LWT HEUNL RAI Responses (cont.)**





#### **NAC-LWT HEUNL RAI Responses (cont.)**

- Gas generation (Hydrogen content)
  - Transport cask must be evaluated for generation of combustible gases; in this case Hydrogen
  - NUREG-1609 limits content to 5% (volume)







#### **Break for Lunch**

**Detailed HEUNL review to follow** 



## **NAC-LWT HEUNL RAI Responses**

• Detailed review



#### **NAC-LWT HEUNL - Structural**







# **NAC-LWT HEUNL – Structural (cont.)**







#### **NAC-LWT HEUNL – Structural (cont.)**







#### **NAC-LWT HEUNL – Structural (cont.)**





#### **NAC-LWT HEUNL – Structural (cont.)**







#### **NAC-LWT HEUNL – Structural (cont.)**







#### **NAC-LWT HEUNL – Thermal**

- Heat load for contents of 4 containers uses a bounding value of 12.9 Watts.
- For normal conditions of transport, the modeling of the ISO container, as described in the LWT SAR, is used.





# **NAC-LWT HEUNL – Thermal (cont.)**





#### **NAC-LWT HEUNL** – Thermal (cont.)





#### **NAC-LWT HEUNL – Thermal (cont.)**

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#### **NAC-LWT HEUNL – Thermal (cont.)**





## **NAC-LWT HEUNL – Operations**

- Loading and unloading operations revised to address additional testing and sequencing
- Procedures revised to record container loading life and monitoring controls – corrosion limits



### **NAC-LWT HEUNL – Design/Manufacturing**





# CLOSING REMARKS and FOLLOW-UP ITEMS



