Light years ahead!

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AREVA TN Americas

- Established in 1965 to transport nuclear materials in the U.S.
- AREVA TN manages globally more than 6,000 shipments of radioactive materials every year by road, rail and sea
- Dry storage since 1985
- Acquired high-performance NUHOMS® horizontal system in 1998
- Market leader with more than 900 systems loaded in the U.S.
Outline of the Presentation

- The NUHOMS® EOS System
- NUHOMS® EOS Innovations
- NUHOMS® EOS Design Philosophy
- EOS 37PTH and EOS 89BTH DSCs
- NUHOMS® EOS Inspection
- NUHOMS® EOS Corrosion Proof
- Conclusions

The NUHOMS® EOS System

- The Next Evolution in Dry Storage from AREVA TN
- Result of Significant Innovation in Dry Storage Technology
- High Capacity, High Heat Load - BWR and PWR Systems
- Still based on Low Risk, Horizontal Storage Concept
- Licensing Application Submitted to NRC – December 2014
- NUHOMS® EOS Available 2017
NUHOMS® EOS Innovations

- Highest capacity and highest heat load in industry
- EOS 37PTH for PWR and EOS 89BTH for BWR
- EOS-HSM is optimized for heat transfer and shielding
- Built-in inspection port built for ease and effectiveness of long-term aging management
- Duplex stainless steel canisters ensure corrosion proof system for plants in marine environments
- Building enclosure for plants located in geographic areas where physical appearance is important

NUHOMS® EOS Innovations

- Basket Design Streamlined for ease of fabrication
- Innovative non-welded, high strength low alloy basket
- Basket Heat Transfer Characterized by Conduction and Radiation
- Increased Heat Rejection to 50 kW with significant margin to safety
- EOS-HSM Airflow Path Optimized to achieve the most efficient heat rejection capability and offer the best shielding performance
NUHOMS® EOS Design Philosophy

Still Above Ground, Still Horizontal

Maximizing Thermal Margins
- Basket Heat Transfer does not require Internal Convection
- Low Helium Backfill Pressure
- Fuel Cladding Temperature not affected by Helium within DSC Cavity

Maximizing ISFSI Operational Performance
- Ease of DSC insertion and withdrawal
- No Lifting of a Loaded DSC
- Same Footprint as existing HSM-H Design
- No change to DSC heat removal Air Flow Paths
- Still Free Standing and compatible with existing HSM arrays

Reinforcing the NUHOMS® Advantage
- Simplicity – Construction and Operation
- Lowest Risk
- Highest Seismic Capability
- Lowest Dose
- Secure Protection from Environmental Hazards
- Axial Position of the DSC above the ground makes it practically immune to effects of flooding, including “smart flood” or “smart wind”
- Licensing Basis Evaluations do not result in any Site-Specific or “Licensee Required” Analysis for Operational Evolutions
- Ease of Inspections for Aging Management – DSC is not lifted
NUHOMS® EOS 37PTH and EOS 89BTH

**NUHOMS® EOS 37PTH System**
- 37 PWR Fuel Assemblies
- Maximum Planar Average Initial Enrichment – 5.00 wt. % U-235
- Maximum Assembly Average Burnup – 62 GWD/MTU
- Minimum Cooling Time – 3 Years
- Variable Fuel Assembly Length

**NUHOMS® EOS 89BTH System**
- 89 BWR Fuel Assemblies
- Maximum Planar Average Initial Enrichment – 4.80 wt. % U-235
- Maximum Assembly Average Burnup – 62 GWD/MTU
- Minimum Cooling Time – 3 Years
- Variable Fuel Assembly Length

**Aging Management Plan**

**NUHOMS® EOS Inspection**

**Inspections**
- NUHOMS® EOS horizontal storage modules have built-in inspection port
- Above ground system allows for ease of inspection of 100% of DSCs without lifting

**Non-Destructive Examination (NDE) Tools**
- NDE techniques include high resolution cameras, surface deposit sampling, eddy current inspection
- Established NDE techniques used to inspect canisters with implementation tool well into development

**Above ground, horizontal system allows for:**
- Simple retrieval for inspection
- Ease of retrieval for shipment off site
- Ease of accessibility in case of need for cleaning or repair
**NUHOMS® EOS Corrosion Proof**

- **NUHOMS® EOS Canister in Duplex Stainless Steel**
  - Not susceptible to stress corrosion cracking in chloride environments
  - Highly resistant to localized and general corrosion
  - Exceptional heat transfer capabilities
  - Exceptional mechanical strength and energy absorption
- **Used in other AREVA Nuclear Waste Applications**
  - TRUPACT-III Transportation Package Containment Boundary
  - High Integrity Radioactive Waste Containers
- **Use 80+ years in aggressive corrosive environments**

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**Conclusion**

- **NUHOMS® EOS** builds on a state-of-the-art and proven system with innovations that prepare for the future...
  - Unparalleled safety and low dose performance
  - Lowest risk and dose in canister loading and transfer
  - Highest seismic capability
  - High capacity
  - High-strength alloy materials with enhanced thermal performance ... 50kW
  - Innovative non-welded basket design
  - Streamlined fabrication process
  - Corrosion-proof duplex stainless steel for plants in marine environments
  - Built-in inspection port for Aging Management
  - Building enclosed for plants located in areas where appearance is important
NUHOMS® EOS
Extended Optimized Storage

Light years ahead!