September 29, 2008

Proposed NAC-UMS Amendments Storage Docket No. 72-1015 Transportation Docket No. 71-9270

for the DOE's Transportation, Aging and Disposal (TAD) Canister-Based System

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NAC – NRC Meeting Agenda

- Introductions
- Licensing Approach & Strategy - Storage
- Licensing Approach & Strategy - Transport
- Overview of the NAC TAD System (UNITAD)
- Schedule
- NRC Questions

UNITAD Storage
Licensing Approach and Strategy

- Docket 72-1015
- Amendment 6 to NAC-UMS CoC
- FSAR, Rev. 7
- Specific appendix prepared for each chapter
- Base document referenced as appropriate
- Addition to CoC and Technical Specifications
- Not applicable to current UMS users

UNITAD Transport Licensing Approach and Strategy

- Docket 71-9270
- Revision 4 to NAC-UMS CoC 9270
- SAR, Rev. 2
- Specific appendix prepared for each chapter
- Base document referenced as appropriate
- Addition to CoC
- Not applicable to current UMS users

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UNITAD System Design Overview

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UNITAD System Design Overview

- Meets DOE TAD Canister System Performance Specification Requirements
- Major components:
  - Canister for 21 PWR fuel assemblies
  - Transportation System
  - Vertical Concrete Cask (VCC)
  - UNITAD Transfer Cask (UTC)

UNITAD System Design Overview

- **Designed and analyzed based on proven, certified NAC UMS System and components**
- **Facilitates integration and use as a complete storage, transport, aging and disposal system**

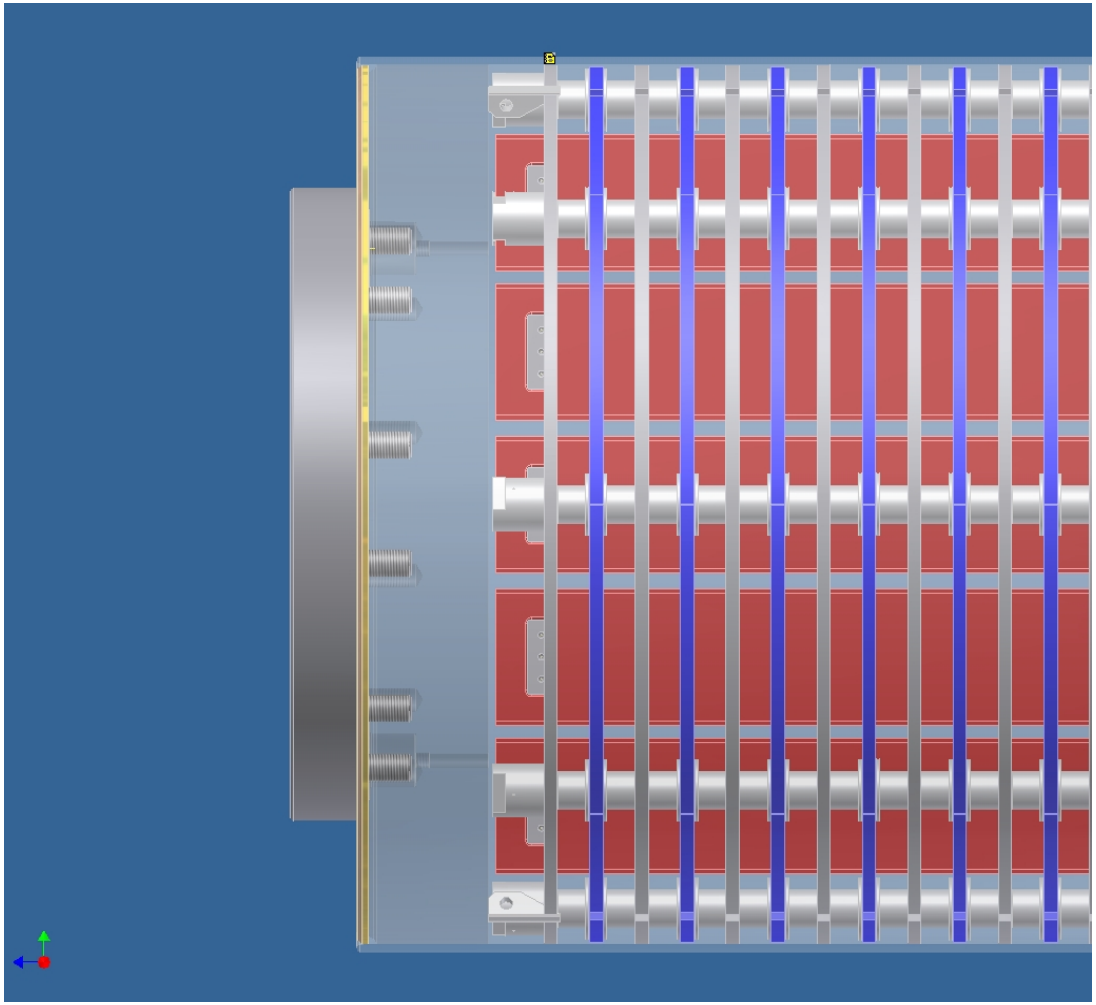
UNITAD Canister Design

- All-welded, stainless steel confinement and containment vessel designed to ASME Code, Section III, Subsection NB
- Designed for ease of fabrication, use and operation based on NAC's currently certified multipurpose UMS System

UNITAD Canister Design

- Provided in two cavity lengths (173 & 183 inches)
- The single closure lid design minimizes operator dose and reduces welding and NDE times and exposures
- The overall canister lengths are 189 and 199 inches including the universal lift fixture
- The canister diameter of 66.5 inches and shell thickness of 0.5 inch satisfy all DOE dimensional requirements

UNITAD Canister Design



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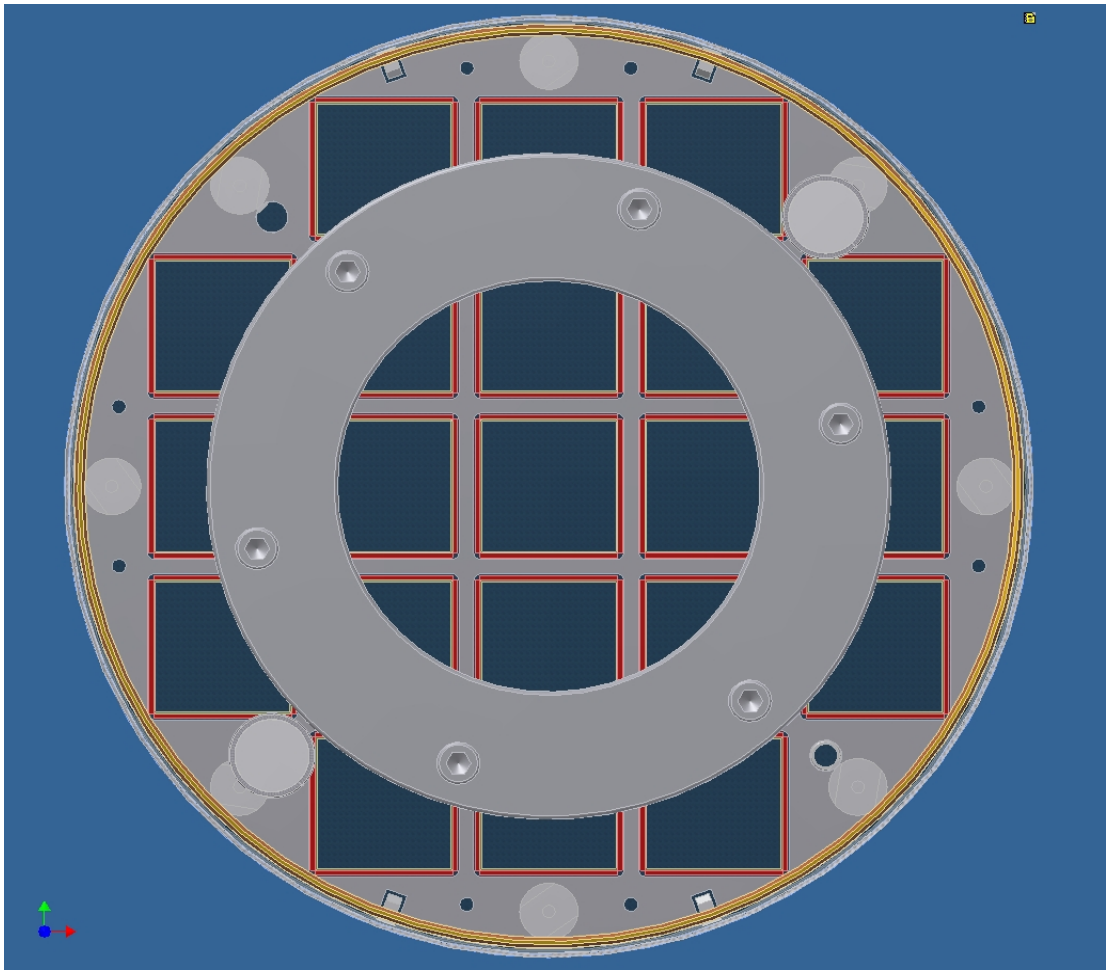
UNITAD Canister Basket Design



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UNITAD Canister Basket Design

- 21-PWR basket design is based on currently certified UMS 24-PWR basket design
- Basket utilizes the proven “flux-trap” and “tube-and-disk” UMS and MPC design
- Basket assembly consists of alternating 1-inch-thick stainless steel and aluminum disks

UNITAD Canister Basket Design

- Thermal analysis based on readily certifiable conduction and radiation heat transfer methods and ISG-11, Revision 3 guidance
- Neutron absorber provided by mechanically assembled borated stainless steel fuel tubes
- The basket nominal fuel tube opening is 9 x 9 inches
- Basket is designed and analyzed in accordance with ASME Code Section III, Subsection NG

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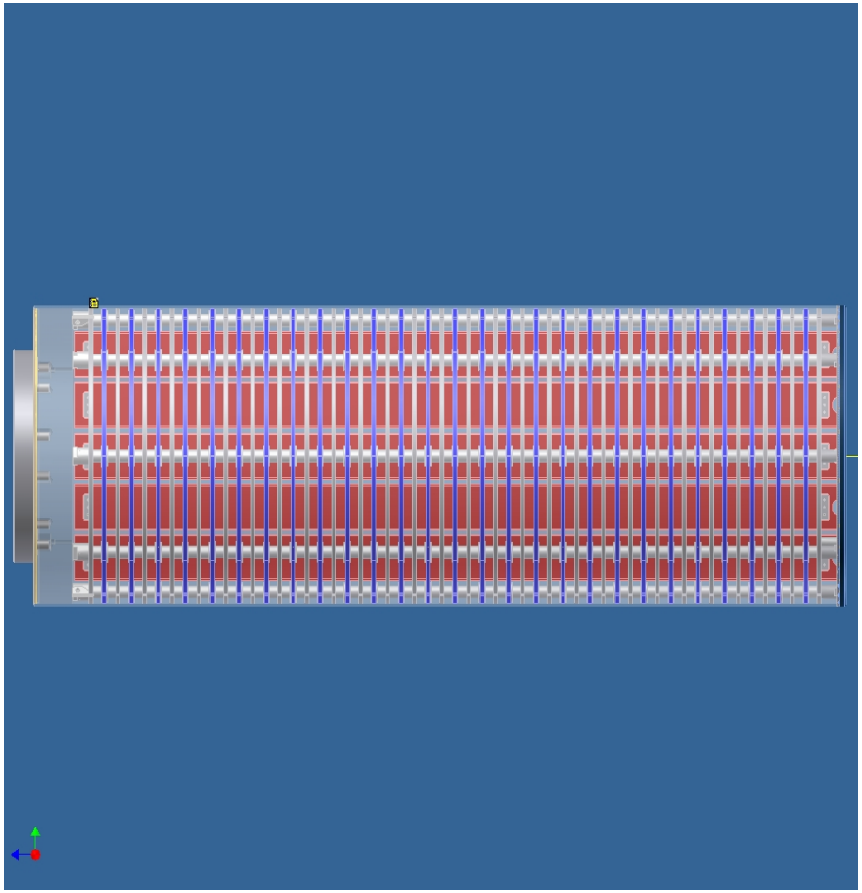
UNITAD Canister and Basket Design



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UNITAD VCC Design

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UNITAD VCC Design

- Vertical Concrete Cask (VCC) - Storage overpack used at ISFSI
- Provides passive structural support, heat dissipation, biological shielding, and protection from environmental and site accident conditions
- Designed and will be constructed in accordance with ACI-349 and ACI-318

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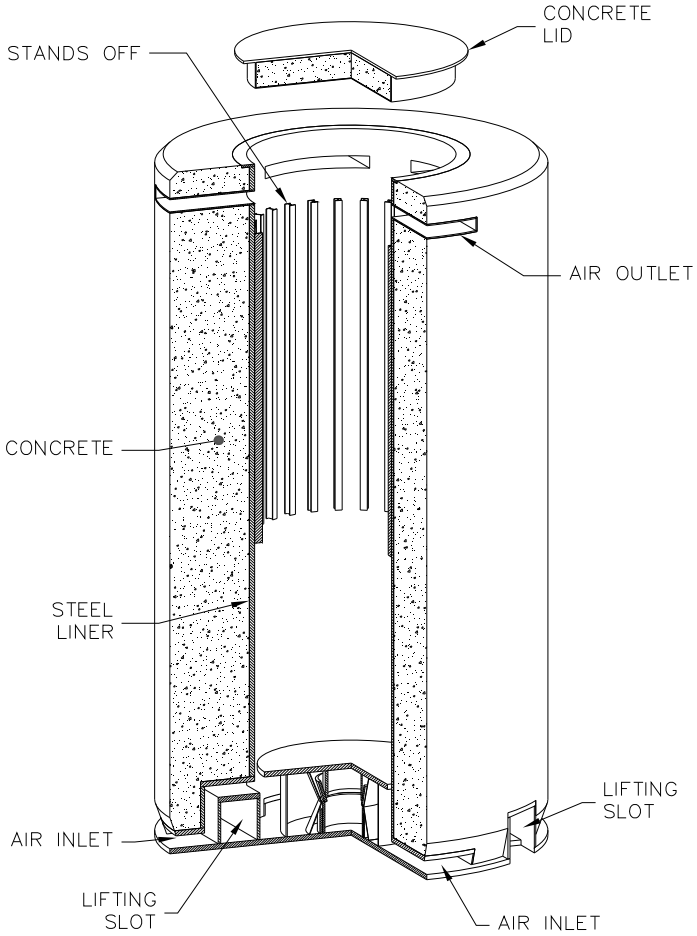
UNITAD VCC Design

- Design and construction of the steel components will be in accordance with ASME Code, Section VIII and AWS D1.1
- Design is similar to NRC-certified VCCs currently in service (UMS and MPC Systems)
- Design analyzed to show that fuel cladding temperatures are maintained below regulatory limits

UNITAD VCC Design



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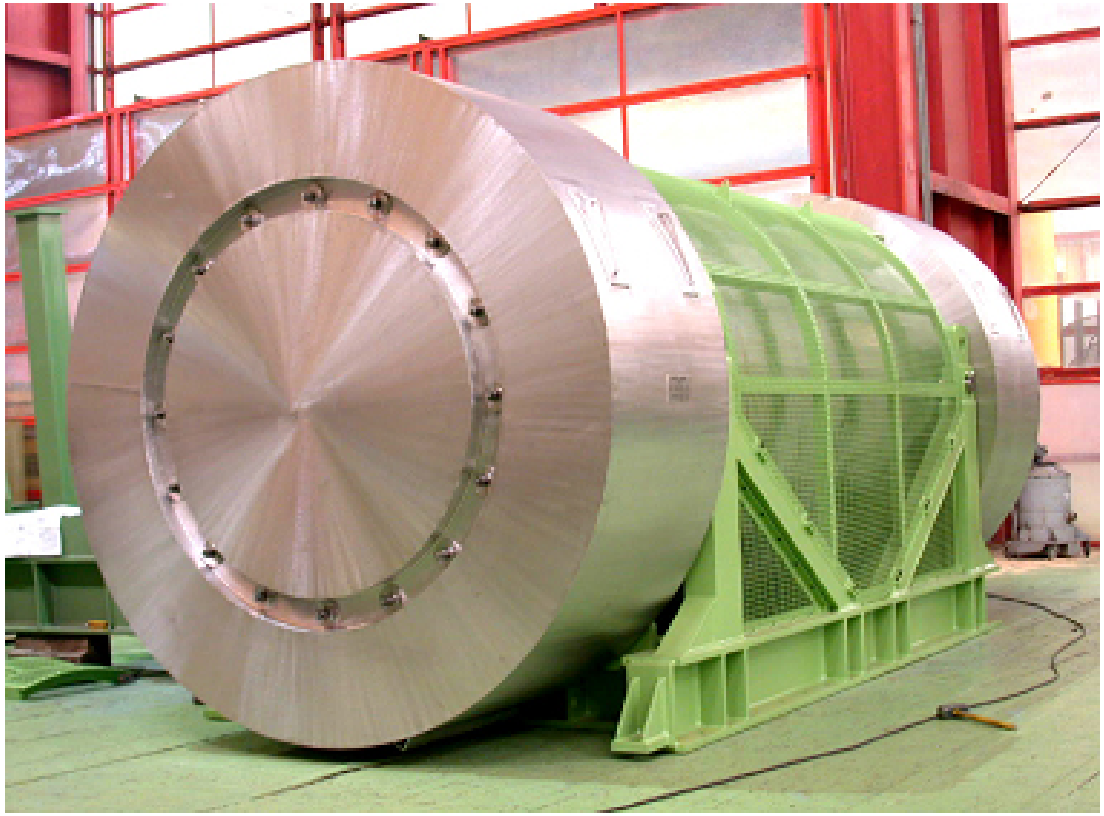
UNITAD VCC Design

- Optimized to minimize top & side surface dose rates for low operator and off-site doses
- Designed to interface with UNITAD Transfer Cask (UTC) and adapter
- Constructed on site utilizing a steel baseplate and liner assembly, two sets of steel reinforcement, and reusable exterior forms

UNITAD Transport Cask System Design

- Based on the certified UMS Transport Cask
- Cask body is a multiwalled cask consisting of stainless steel inner and outer shells separated by a poured-in-place lead gamma shield and surrounded by a solid neutron shield
- Developed based on certified, and operationally proven, transportation cask systems (e.g., NAC-STC)

UNITAD Transport Cask System Design



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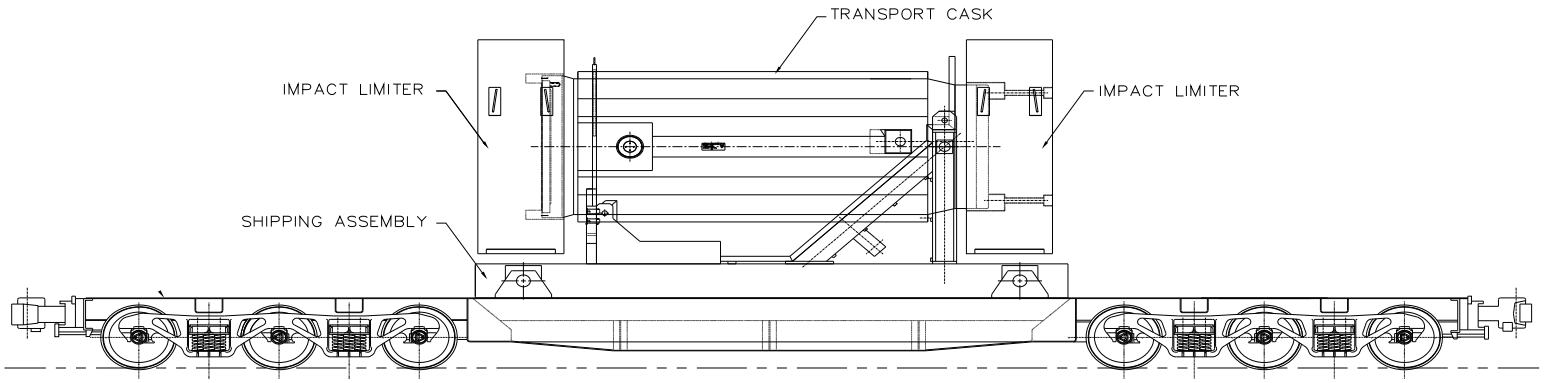
UNITAD Transport Cask System Design

- **Designed to accommodate both UNITAD canister lengths with the use of an axial spacer to meet the DOE performance specification**

UNITAD Transport Cask System Design



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UNITAD Transport Cask System Design

- Transport Cask and contents are protected from accident loadings by impact limiters
- Impact limiters are balsa and redwood filled with stainless steel shells designed to meet the hypothetical accident conditions of 10 CFR 71.73

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UNITAD System Design Characteristics

- Decay heat load capability:
  - Storage – approximately 25 kW
  - Transport – approximately 18 kW
- Maximum transport cask load on cask handling crane 125 tons
- Maximum transportation package weight on rail car < 180 tons

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UNITAD System Design Characteristics

- UTC weight < 120 tons
- VCC weight < 180 tons
- System confinement/containment leak rate – leak tight per ANSI N14.5-1997

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Design/Licensing Summary

- UMS Amendments address DOE requirements
- Notable changes limited to:
  - Capacity decrease from 24 to 21 assemblies
  - Fuel tubes/neutron absorber change to borated stainless steel
- Other changes (previously reviewed by NRC)
  - Single closure lid
  - VCC operational enhancements
  - Optimized impact limiters

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Anticipated Schedule

- **Based on published NRC timeliness goals per RIS 2005-27, Rev 1**
- **Initial submittals** *(Storage & Transport)*
  - September 2009
- **Acceptance reviews complete & docketing**
  - October 2009
- **Final transport CoC issued – October 2010**
- **Storage CoC completed – December 2010**
  - Effective date – May 2011 (DFR)

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Questions?

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