NAC INTERNATIONAL

Transportation Infrastructure

May 8, 2013

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MAGNASTOR

NEI Used Fuel Management Conference

St. Petersburg, FL

Corporate Cask System Technology & Licensing Information

Cask Designation	U.S. NRC CoC Number or Docket Number	Amendment Number / Application
MAGNASTOR	72-1031 71-9356 Pending	2/Storage
UMS	71-9270 72-1015	3/Transport, 5/Storage
NAC-MPC	71-9235 72-1025	12/Transport, 6/Storage
NAC-STC	71-9235 72-1013 **	12/Transport, 0/Storage
NAC-I28 S/T	72-1020 *	0/Storage
NAC-C28 S/T	72-1003 *	0/Storage
NAC-I26 S/T	72-1002 *	0/Storage
NAC-LWT	71-9225 NRC 71-9225 DOE	57/Transport 8/Transport
NAC-1	71-9183 *	13/Transport
NLI-10/24	71-9034 *	9/Transport
NLI-1/2	71-9010 *	41/Transport

* Certificate no longer active
** Site Specific
☐ NAC acquired these cask designs





NAC Licensing Status & DOE Infrastructure Needs

- **More than 3,000 UNF shipments covering 1.7 million miles have been conducted in the US over the past 40 years. None of these shipments suffered any release of their contents - So, we're good to go for future shipments right?**
- **Not quite. What we have done, and what we need to do are two VERY different things.**
- **The size of future UNF disposition shipments from utilities and the scale of the shipment campaign require many changes to the status quo.**

NAC Licensing Status & DOE Infrastructure Needs

- **More than 3,000 UNF shipments … miles have been conducted in th… y… …pments s… th… …e good to g… …ri…**
- **Not quite. What w… …ve done, and what we need t… …do are two VERY diffe… things.**
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Some of the larger, rail sized casks used in the past are no longer certified.

Most shipments done to date have been in smaller capacity casks that can't support shipment of the canisters in dry storage.

The rail cars used in the past do not meet the requirements of S-2043, and the railroads can refuse them

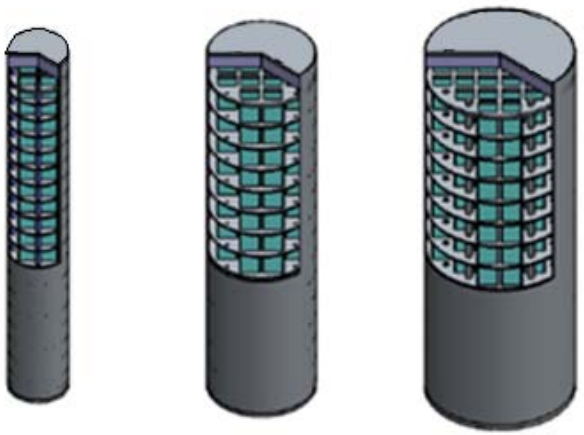
NAC Licensing Status & DOE Infrastructure Needs

- **Shipping casks don't exist for most of the canisters in Dry storage, and there are lots of different designs;**
- **Commercial rail cars approved to meet the required operating standard of AAR-S-2043 don't exist;**
- **Training and support for emergency responders has not been provided;**
- **A Discussion Draft of the Nuclear Waste Administration Act of 2013 is out for review:**
  - This draft does not change the requirements for NRC certification of Casks to store and transport UNF from utilities to consolidated storage, or to a repository
  - This draft does not change any of the requirements to use rail cars that meet the AAR-S-2043 Specification
  - This draft does not change the licensing basis for either a CSF or a Repository.

NAC Licensing Status & DOE Infrastructure Needs

- **Shipping casks are licensed but haven't been fabricated for most of the canisters currently in dry storage; and there are lots of different transport cask designs;**
  - Current canisters in dry storage map to as many as 13 different transportation cask systems.
  - The cost of procuring each transport cask with the required ancillary equipment is significant. Depending on the capacity of the cask, full rail sized cask systems can cost from $4.5M - $6.5M
  - The cost of storing and maintaining a large inventory of transport casks is significant.
  - Before DOE embarks on a large capital acquisition campaign to stock an inventory of rail casks, consideration should be given to standardizing on a few designs to cover the range of canisters to be shipped.

- **Each vendor has multiple canister designs. These range in size from 24 PWR, to 39 BWR assemblies**
  - Each canister size is typically licensed for transportation in one specific transport cask. The canister is part of the licensed content for that transport cask.
  - It is possible to license 1 large transport cask per vendor to take each of that vendor's canisters with the use of shims and spacers.



NAC Licensing Status & DOE Infrastructure Needs

- **Commercial rail cars approved to meet AAR-S-2043 don't exist;**
- **The PFS prototype rail car did not successfully complete the individual car qualification testing, and never started the consist tests.**
- **A Navy cask car has successfully completed stability testing, but has not undergone consist testing, and does not have the required active monitoring systems installed yet.**

NAC Licensing Status & DOE Infrastructure Needs

- **Developing and qualifying rail cars to meet AAR-S-2043 is not a trivial effort;**
  - Includes all cars in the trains including buffer & security cars;
  - Requires static and dynamic modeling before construction;
  - Requires full scale characterization, static, and dynamic; testing of each car and the train as a whole;
  - Requires a 100,000 mile evaluation period.
- **In addition to performance testing, the cars must include**:
  - Requires Electronically Controlled Pneumatic (ECP) Brakes;
  - Real Time Monitoring of:
    - Longitudinal, vertical and lateral Car Body acceleration
    - Bearing Temp
    - Wheel flat indication
    - Roll angles (the car has to sustain 5^{o} over 3 cycles)
- **Development time can take 5 – 7 years**

NAC Licensing Status & DOE Infrastructure Needs

- **Training and support for emergency responders has not started. It will take 5-7 years to develop and then implement a program compliant with the current NWPA Section 180(c)**
  - The discussion draft for the Nuclear Waste Administration Act expands the activities funded under “Transportation Assistance”. This expansion would likely increase the time required to implement a functioning program;
  - To make the most of planning efforts, DOE should involve transportation service providers from industry to provide informed perspective and practical inputs. All emergency response will have to integrate well with industry provided hardware;
  - Integrating an emergency responder exercise with a package performance study at TTCI would be immensely helpful. This would allow emergency responders to address an actual accident site and would help identify training and equipment gaps.

- **Integrating Waste Management Activities**
  - One of the greatest needs for the waste management system is better integration between the short, and long term UNF management activities;
  - DOE has taken some important first steps with pursuit of design concepts for both interim storage and standardized canisters for transportation aging and disposal;
  - Although it would be ideal to have a viable repository plan in place, there are interim steps DOE could take in moving toward a better integrated system prior to having all of the answers;
  - Creating a framework that maximizes the potential for integration now will introduce significant infrastructure cost and schedule savings over the life of the waste management program – no matter who runs it.

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