

## Audit Status

Mailed RFP to 8 Chicago Area CPA Firms

Interviewed 3 Finalist

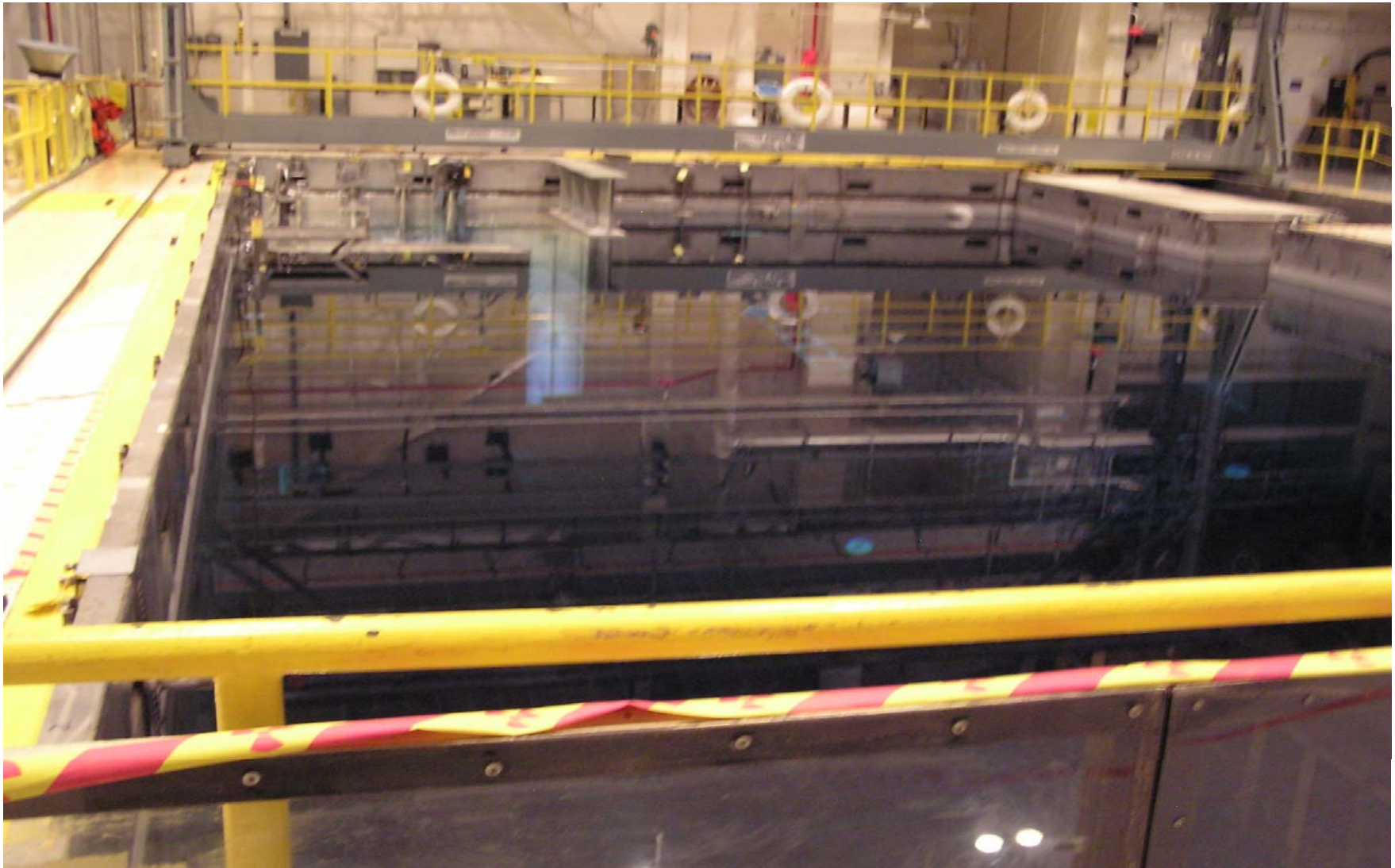
Close to Awarding the Audit

Commence ASAP to Ensure Report by Year End

# Design Standards for ISFSI



# Now – Wet Storage in Fuel Building



# Next – Dry Cask Storage Facility



# Dry Fuel Storage Location



# Zion Dry Cask Storage System

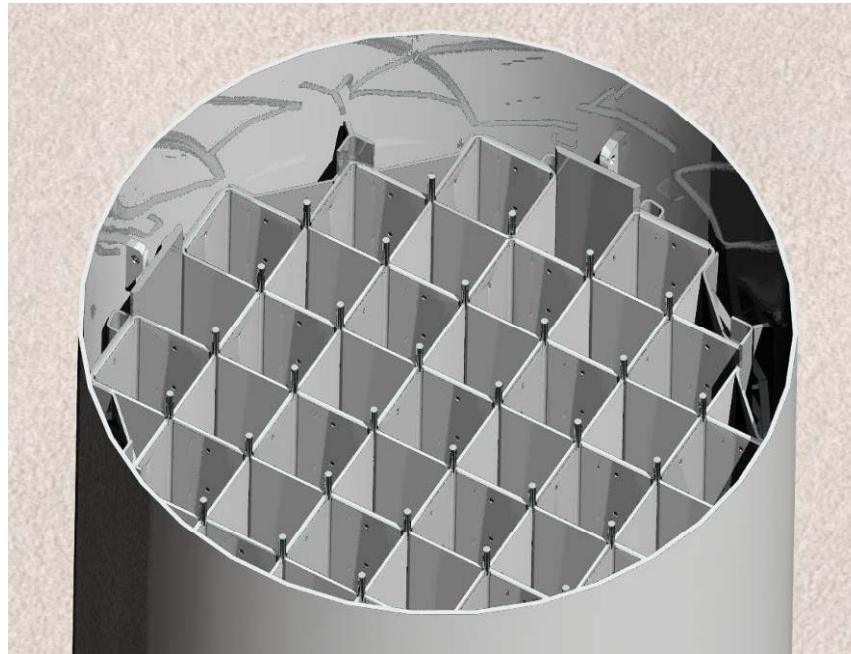
**MAGNASTOR System  
61 Fuel + 4 GTCC**

**2 Transfer Casks  
for SNF and GTCC**

**Concrete Cask**

**Canister**

**Transfer Cask**



# Dry Cask Storage Components

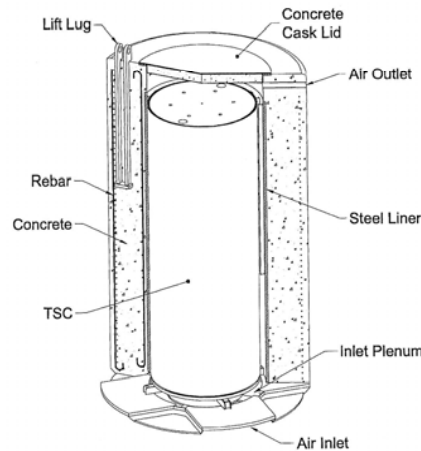
## Transportable Storage Canister

6' diameter X 15'-5" high

Empty weight: ~20 tons

Loaded weight: ~51 tons

Capacity: 37 used fuel  
assemblies



## Vertical Concrete Cask

11'-4" diameter X 18'-9"  
high

Loaded weight: 157 tons

Steel liner: 1 $\frac{3}{4}$ " thick

Concrete: 26" thick

# Zion Vertical Concrete Casks





## Code of Federal Regulations

### U.S. Nuclear Regulatory Commission Part 72

Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater-Than-Class-C Waste

NAC International, Inc. submits  
Modular Advanced Generation Nuclear All-purpose Storage  
(MAGNASTOR®) Dry Cask Storage System  
**Final Safety Analysis Report**

NRC reviews and prepares  
**Safety Evaluation Report**  
**CERTIFICATE OF COMPLIANCE NO. 1031**  
Amendment 2  
Docket No. 72-1031  
Amendment 3 – Expected December 2012

# NRC Safety Evaluation Report - Contents



- Spent fuel to be stored
- Structural evaluations
- Thermal evaluations
- Confinement (leakage) evaluations
- Shielding evaluations
- Radiation protection evaluations
- Accident and natural phenomena
- Technical Specifications and operating controls
- Criticality evaluations
- Materials evaluations
- Operating procedures evaluations
- Acceptance tests and Maintenance Program evaluations
- Quality Assurance

## 72.212 Conditions of the General License

- The general license is limited to spent fuel which the licensee (*Zion Solutions*) is authorized to possess at the site.
- This general license is limited to storage of spent fuel in casks approved under 10 CFR 72.
- The license for the storage of spent fuel in each cask is granted for 20 years and can be renewed through Certificate of Compliance process.

## 72.212 Conditions of the General License

- Review the **Safety Analysis Report** referenced in the **Certificate of Compliance** and the related NRC **Safety Evaluation Report** to make sure the (Zion NPS) site parameters, including analyses of earthquake intensity and tornado missiles, are enveloped by the cask design bases considered in these reports
- Protect the spent fuel against the threat of radiological sabotage.

## MAGNASTOR Criteria

- Temperature: -40°F to +133°F
- Snow & Ice: 100 psf
- Seismic:
  - 0.37 g horizontal
  - 0.25 g vertical
- Flood: 50 feet above fuel casks
- Seiche: 15 fps, fully submerged
- Fire/Explosion: 22 psig
- Tip-over (accidental): canister maintains structural integrity
- Tornado: 360 mph

## ZNPS Site Criteria

- Temperature: -26°F max / +105°F
- Snow & Ice: 39 psf
- Seismic:
  - 0.17g horizontal
  - 0.11g vertical
- Flood: ~6 feet below fuel casks
- Seiche: below fuel casks
- Fire: No equivalent criteria
- Tip-over: No equivalent criteria
- Tornado: 360 mph

## **Dry Storage Canister Design & ZNPS Licensed Criteria**

- 2.5" diameter pipe at 190 mph
- 8" diameter wood pole at 225 mph
- 6", 8", 10", 12" diameter pipes at 225 mph
- 4"x 12" wood at 255 mph
- 4000# automobile at 255 mph
- 75# concrete block at 255 mph

## **NRC Regulatory Guide 1.76 Design Basis Tornado Missiles**

- 1" diameter steel sphere at 18 mph
- 6.5" diameter pipe at 92 mph
- 4000# automobile at 92 mph