Entergy
Dry Fuel Storage Program

September 25, 2003

Introductions and Opening Remarks

Presentation Outline

- Organization
- Operating Experience
- Schedule for Activities
- Holtec Cask System
- ISFSI
- Cask Crane
- Communications Plan

Organization

- Fleet approach (ENS and ENNE)
- River Bend Station Dry Fuel Storage

Entergy Nuclear South

Dry Fuel Storage Program

Arkansas Nuclear One

Grand Gulf Nuclear Station

River Bend Station

DFS Program Model

- Central direction
- Strong site organizations
- Common contract for the Holtec cask system
- Resource sharing
  - Personnel
  - Equipment

Central Direction

- Provides centralized fleet-wide direction
- Serves as focal point for cask vendor oversight and communications
- Strengthens communications of information and best practices among ISFSIs
- Drives standardized programs and processes
- Maintains a comprehensive strategic plan
- Provides common response to industry issues

Site Organizations

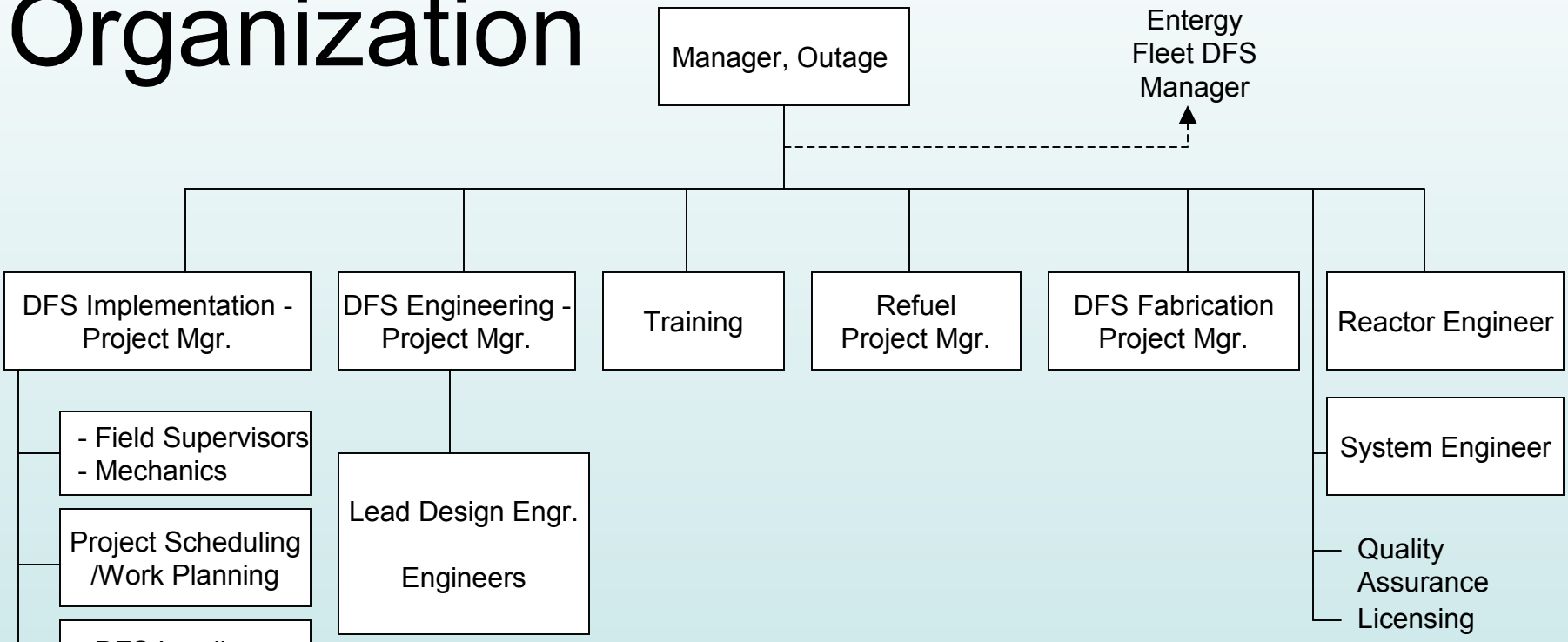
- Develop and implement detailed plans for site activities
- Manage site department interfaces
- Manage site modifications including ISFSI design and construction
- Manage cask loading programs
- Provide continuing in-service cask system performance monitoring and support
- Maintain DFS equipment

DFS Project Team

Headquarters and site representatives

- Management
- Contracts
- Engineering
- Licensing
- Supplier QA
- Operations
- Maintenance
- Training

River Bend Dry Fuel Storage Organization



NOTE:
This organization chart shows functional reporting relationships only for a typical loading campaign. The complicated nature of the projects require an integrated team approach.

Operating Experience

- ANO and Fitzpatrick
- Industry OE
- Trojan
- Holtec Users Group (HUG)

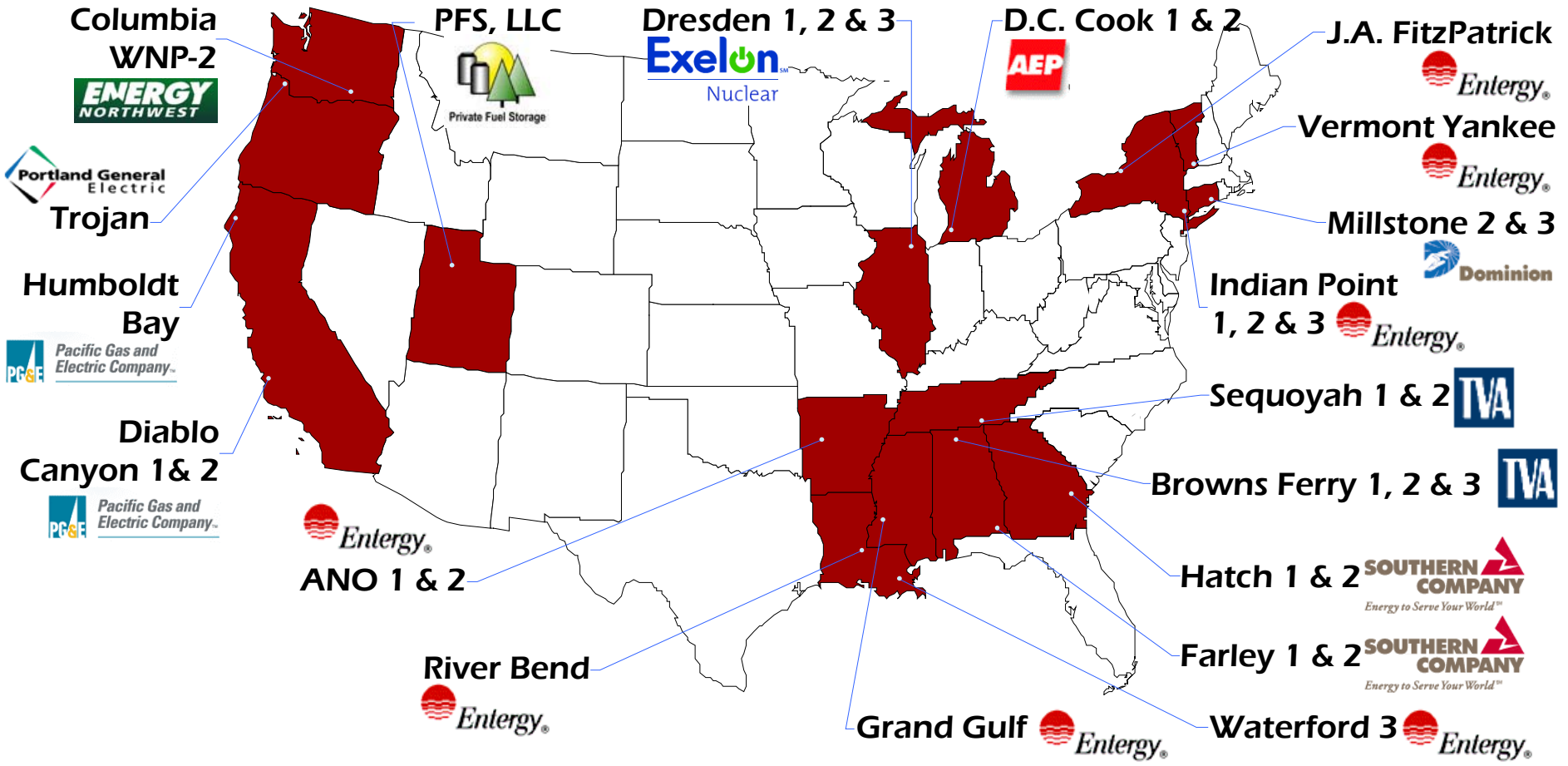
Experience Sharing

- Weekly communication (ECH, ANO, RBS, GGNS)
  - DFS Project Team conference calls
  - DFS Project Team / Holtec conference calls
- RBS observations of key activities
- Information sharing visits
- Bi-weekly fleet conference calls

Other Operating Experience

- Dry Fuel Storage Industry OE
- Trojan
  - Dry Fuel Storage Technical Advisor (Holtec)
- Holtec Users Group

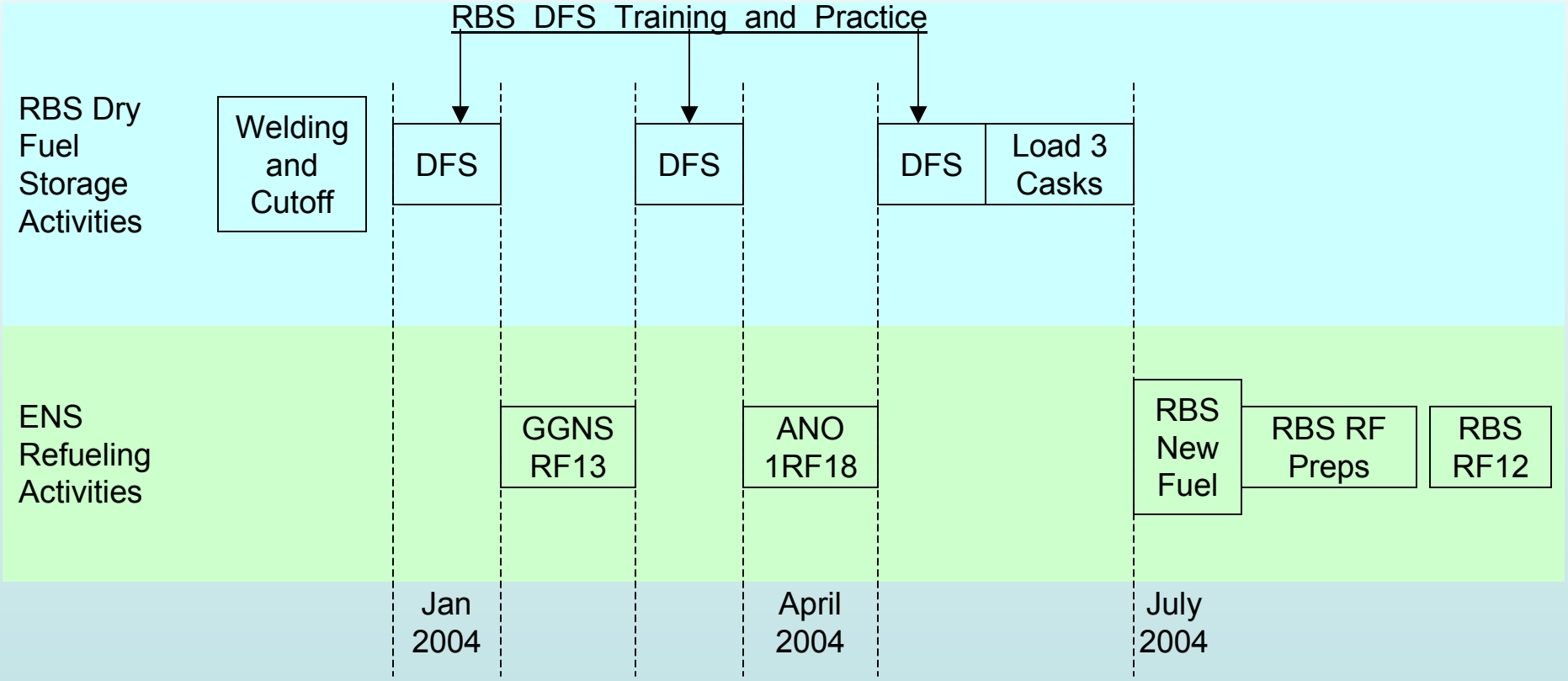
Holtec Dry Storage Users



Schedule

- Cycle Plan Coordination
- Spent Fuel Inventory
- Full core offload / long term schedule
- Special Considerations Fuel

Cycle Plan Coordination

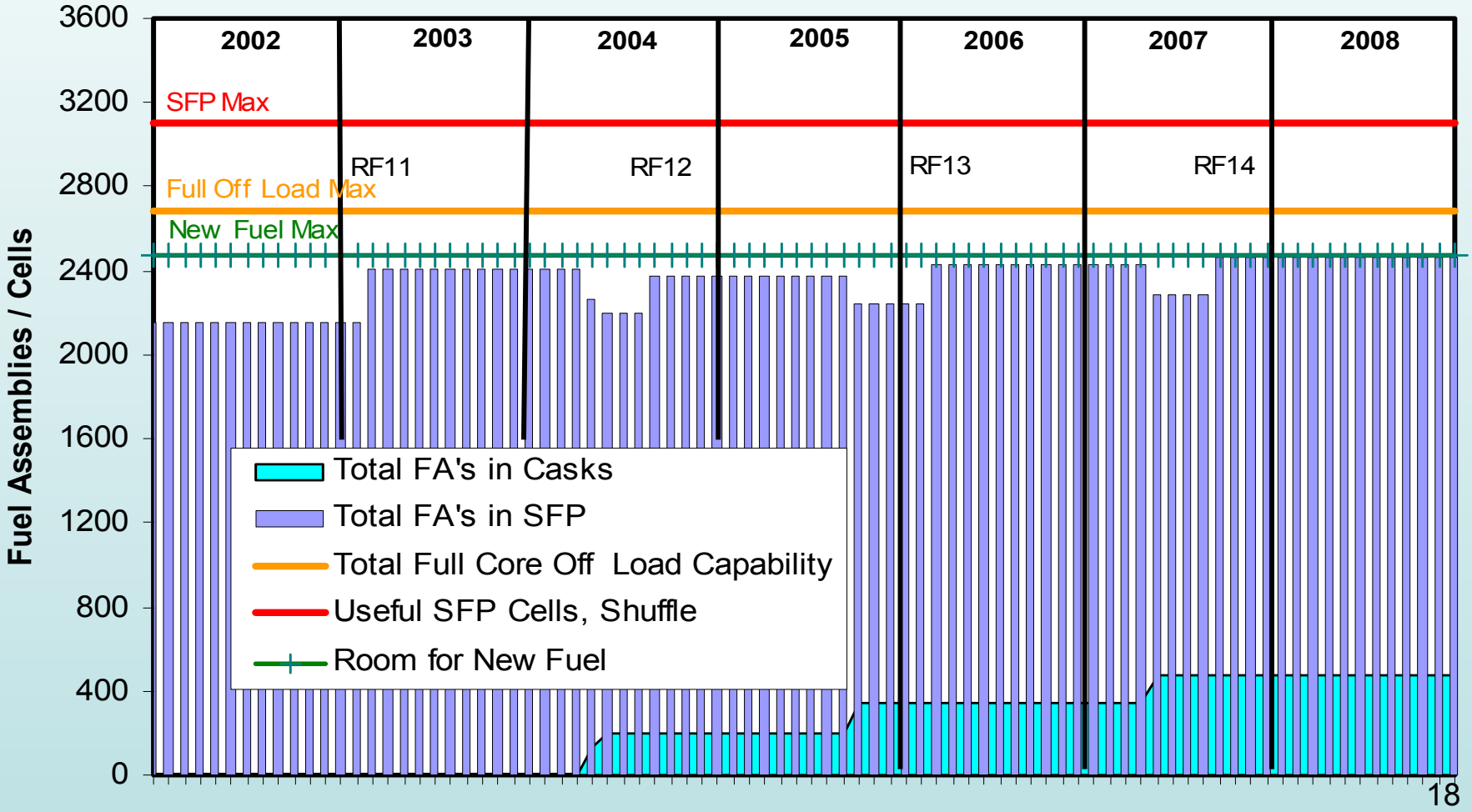


Spent Fuel Inventory

Spent Fuel Pool capacity	3104	cells
Upper Containment Pool	200	cells
Spent Fuel Pool core offload space	424	cells
Current inventory	2404	assemblies
Current space available	276	cells
Preliminary RF-12 reload	176	assemblies
Projected space available after RF-12 with no casks loaded	100	cells

Full Core Offload

Full Core Offload
Long Term Schedule



Special Considerations Fuel

- Heavy crud fuel – ~400 assemblies
- Failed fuel – < 20 assemblies

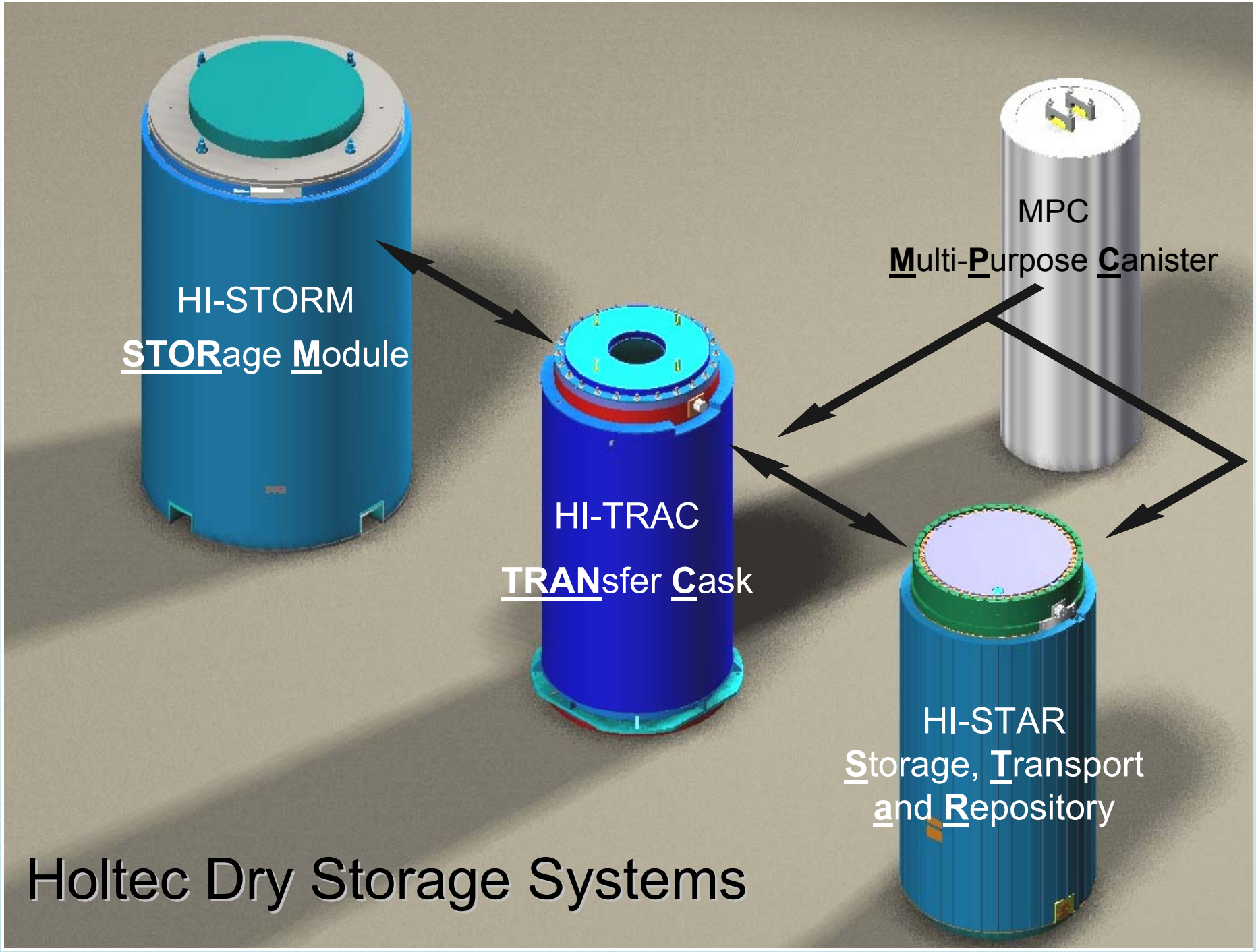
River Bend's initial loadings will not include failed fuel or heavy crud fuel

Dry Fuel Storage
Project Milestones

- *Place concrete for ISFSI pad - Complete*
- *Welding demonstration – 4Q2003*
- *Fluid Operations demonstration – 1Q2004*
- *Heavy Loads demonstration – 2Q2004*
- *Transfer Ops demonstration – 2Q2004*
- *First Load (3 casks) – May/June 2004*

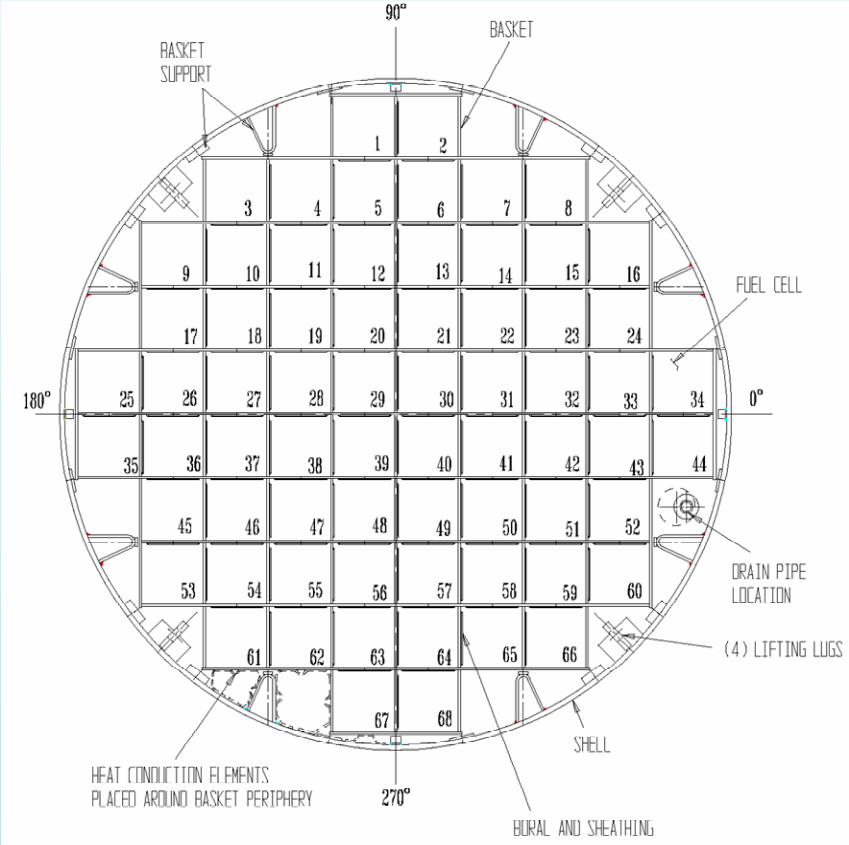
Holtec Cask System

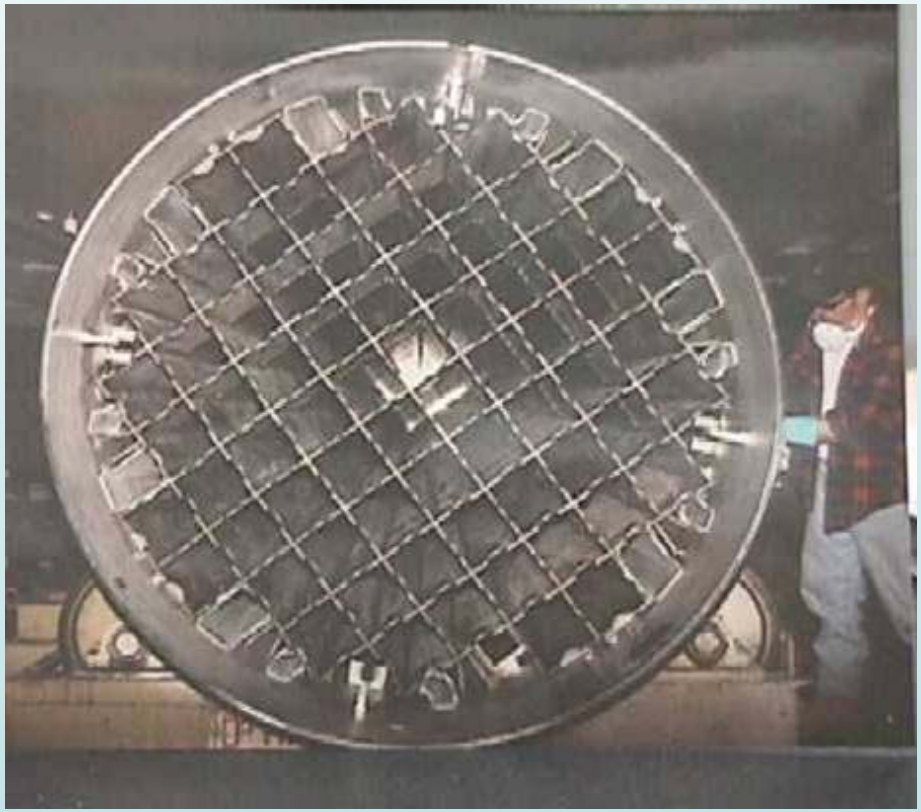
- Key components
  - HI-STORM 100S Family
  - MPC
  - HI-STORM Storage Overpack
- Loading Sequence


HI-STORM
STORage Module
MPC
Multi-Purpose Canister
HI-TRAC
TRANsfer Cask
HI-STAR
Storage, Transport
and Repository
Holtec Dry Storage Systems

Multi-Purpose Canister

MPC-68



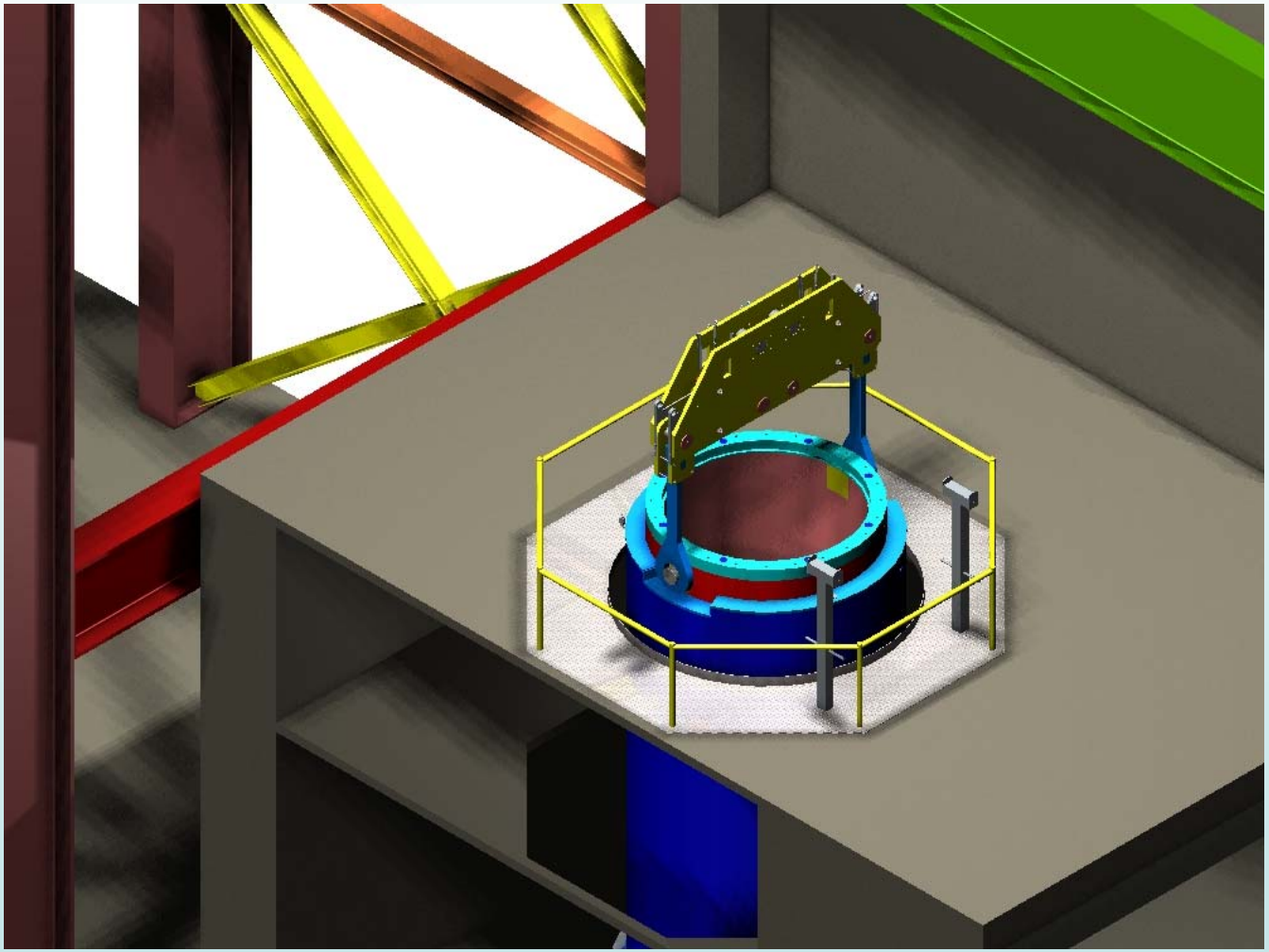


HI-STORM Cask

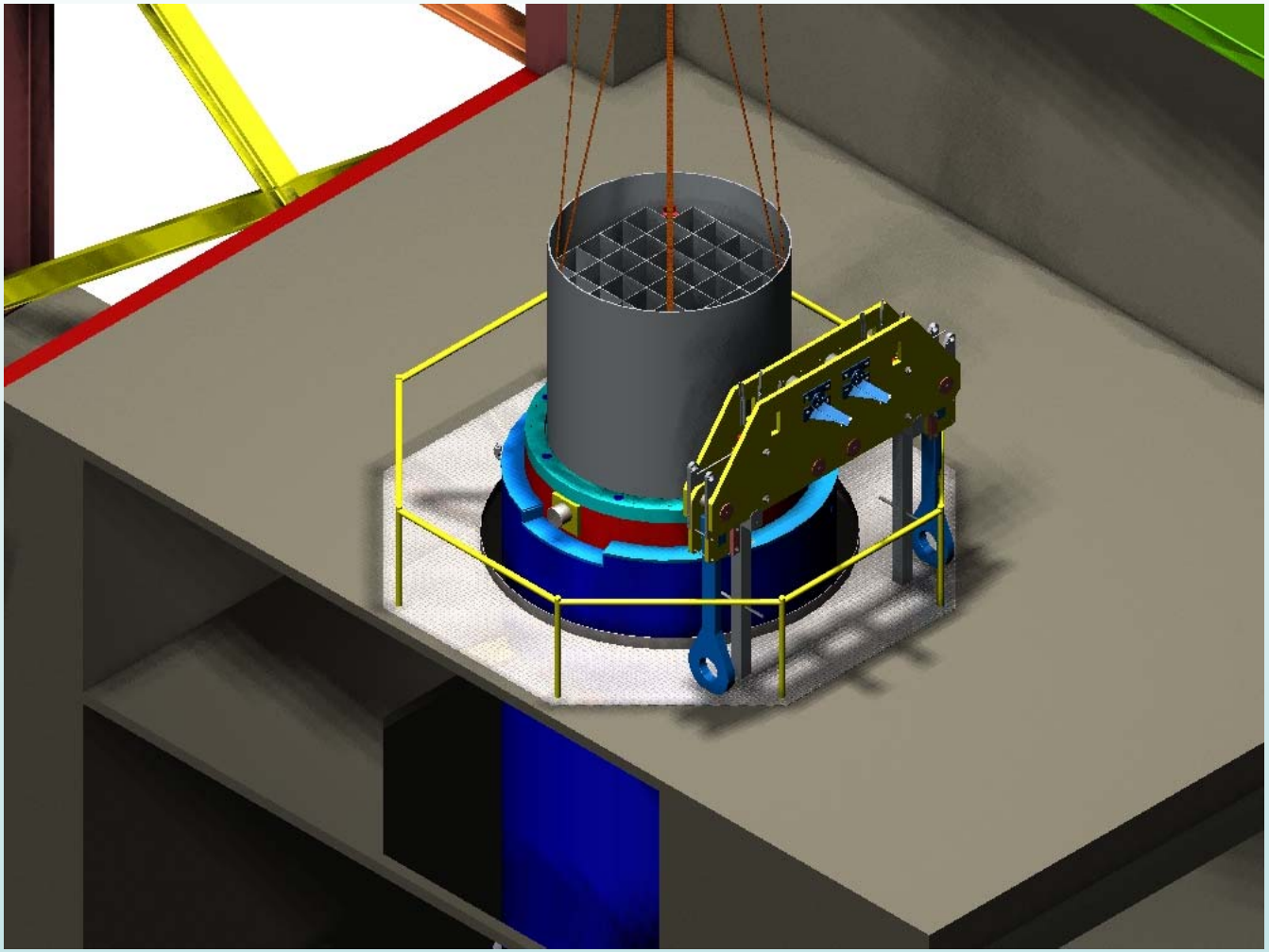
- HI-STORM 100S
- **20 ft** tall, **11 ft** wide
- Steel liner filled with concrete
- Approximately **200 tons** when loaded

HI-STORM Concrete Placement

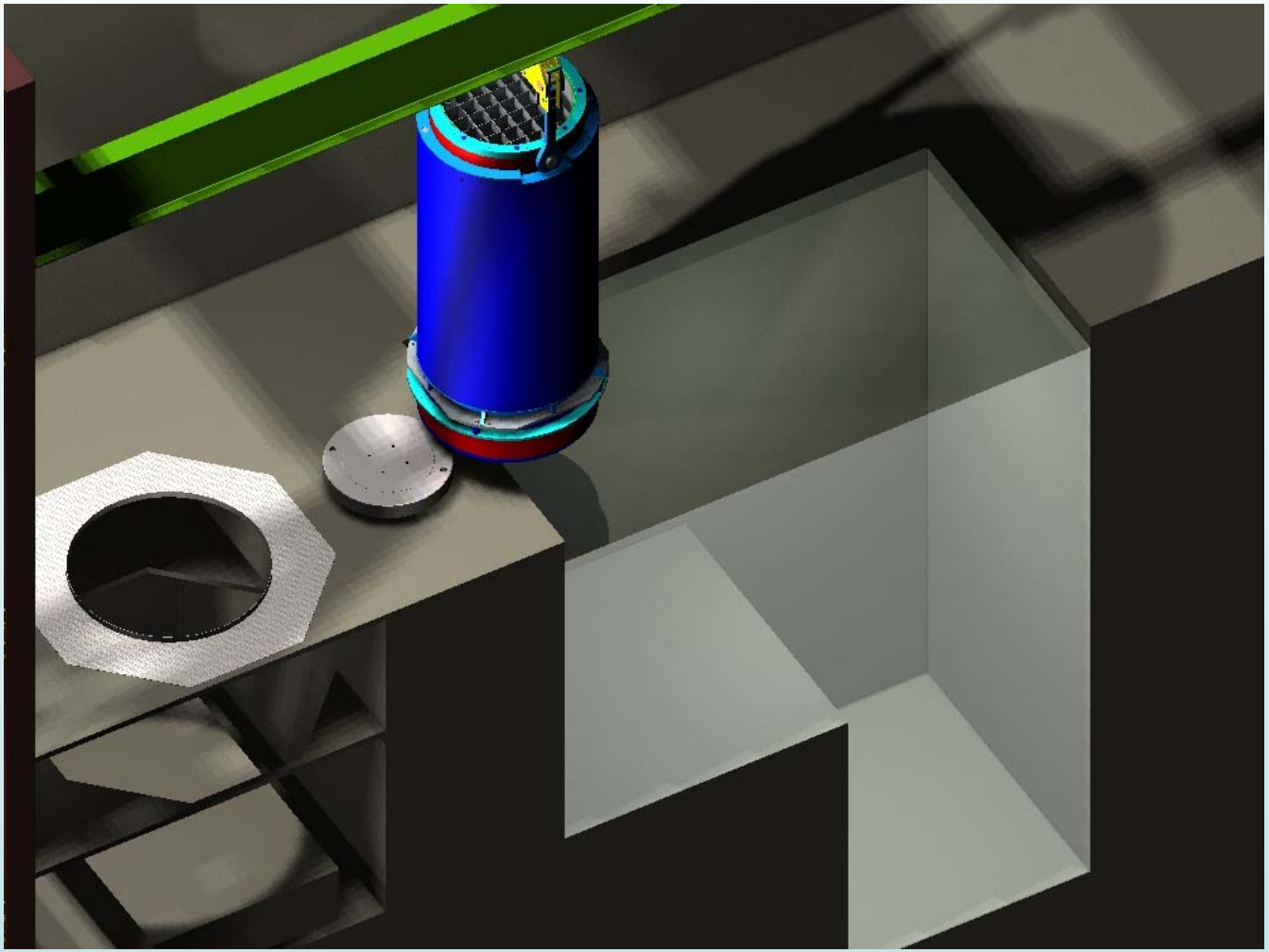
HI-TRAC In Cask Pit



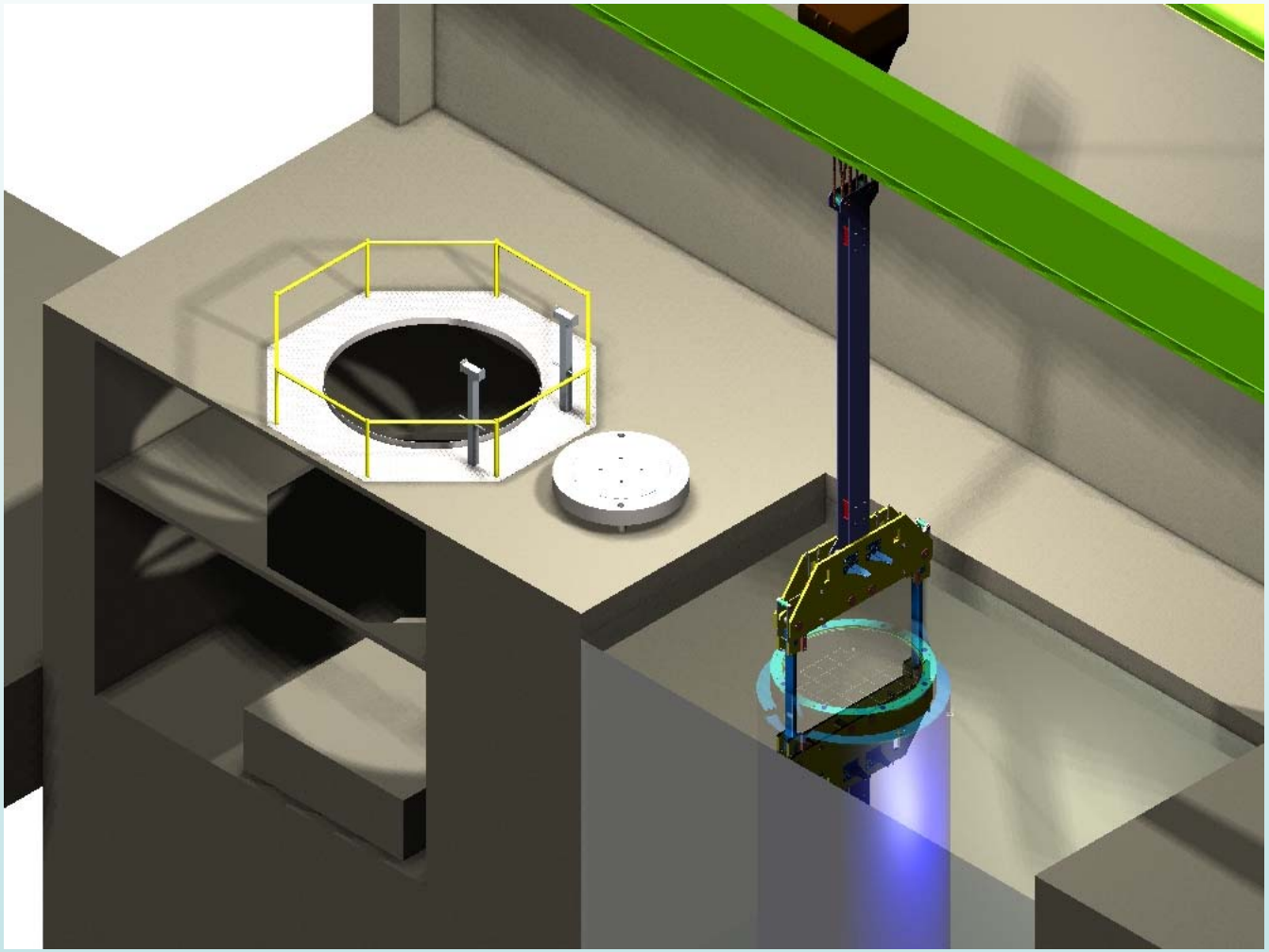
Canister is Lowered into Transfer Cask



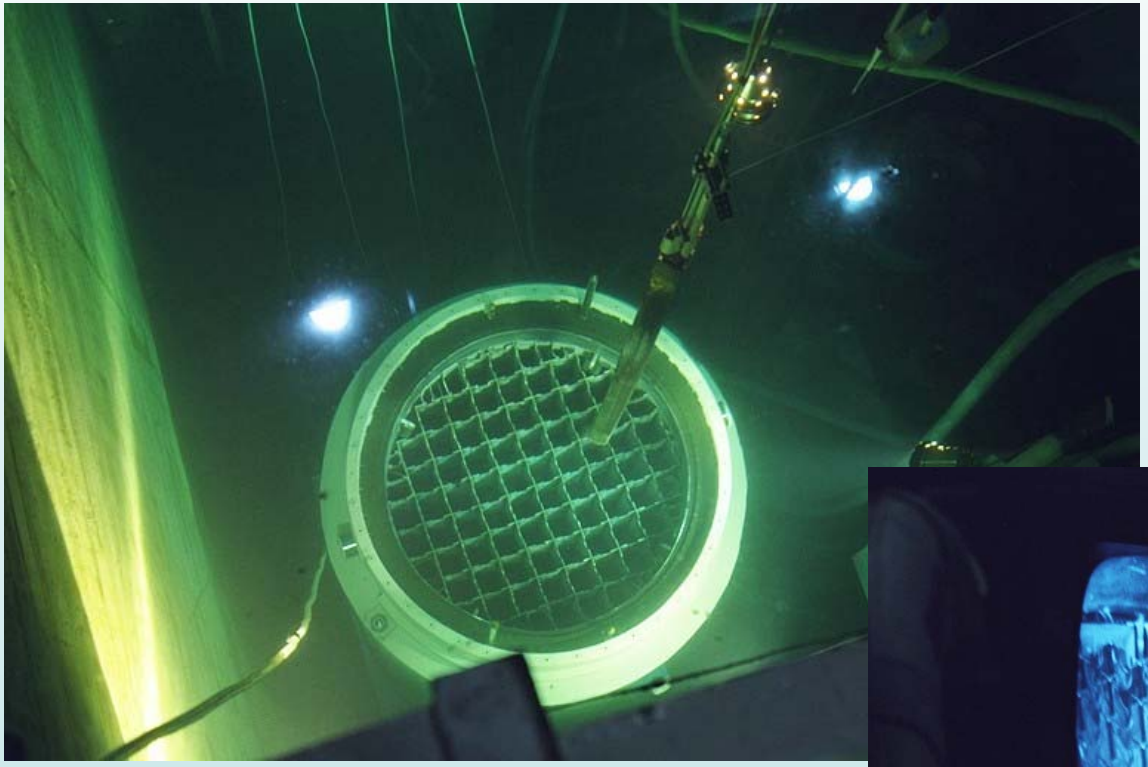
Move from Pit to Cask Pool

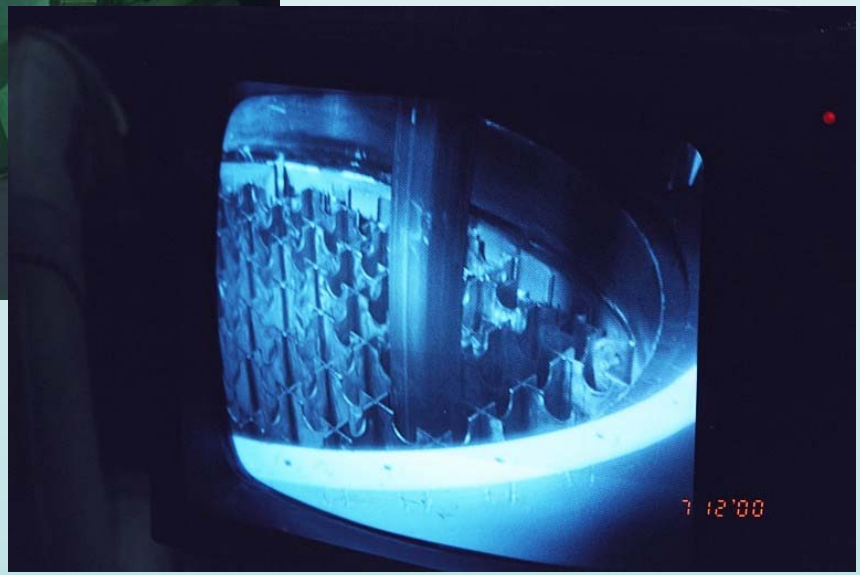


Lift Yoke with Extension

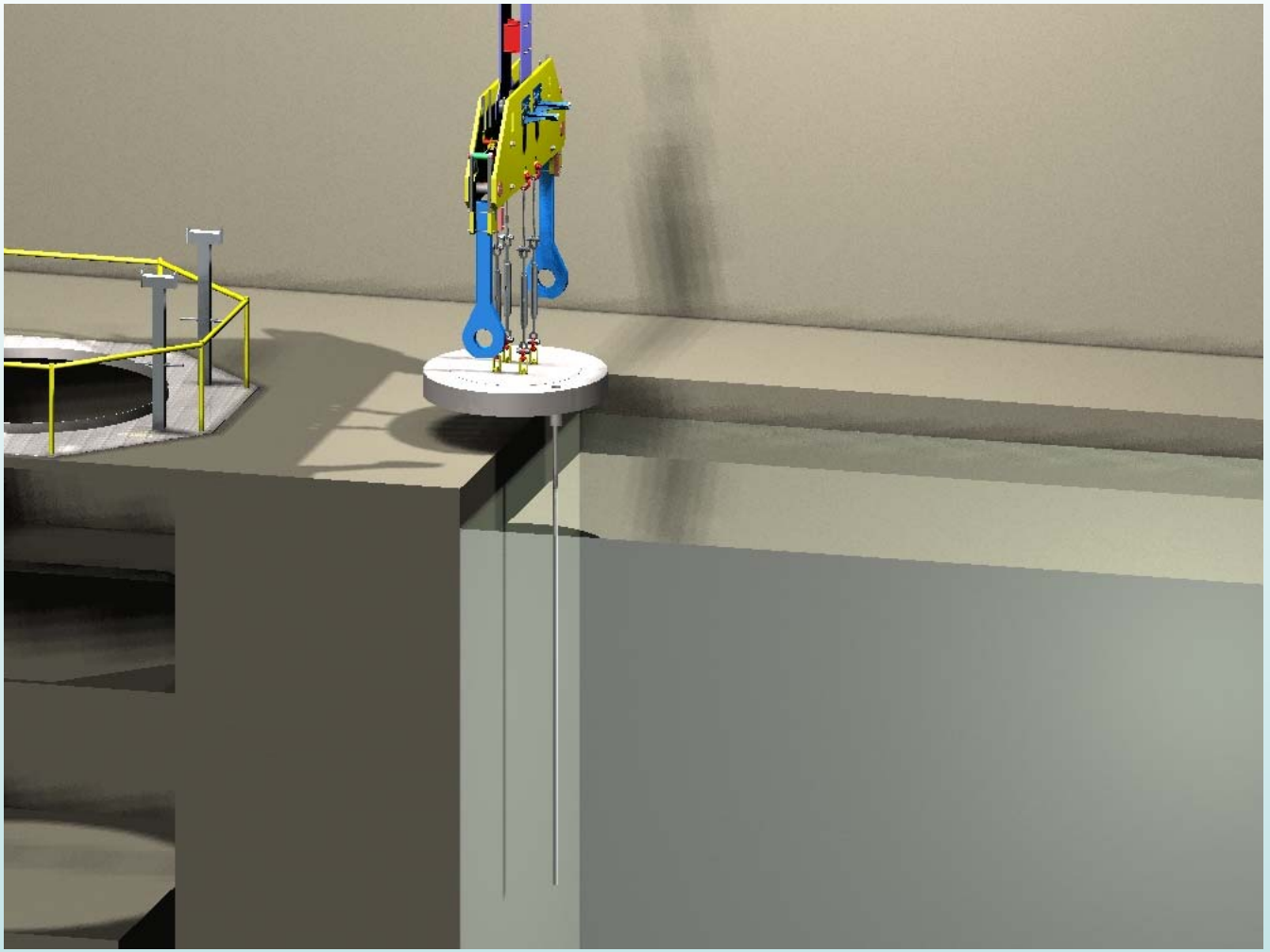


Fuel Loading

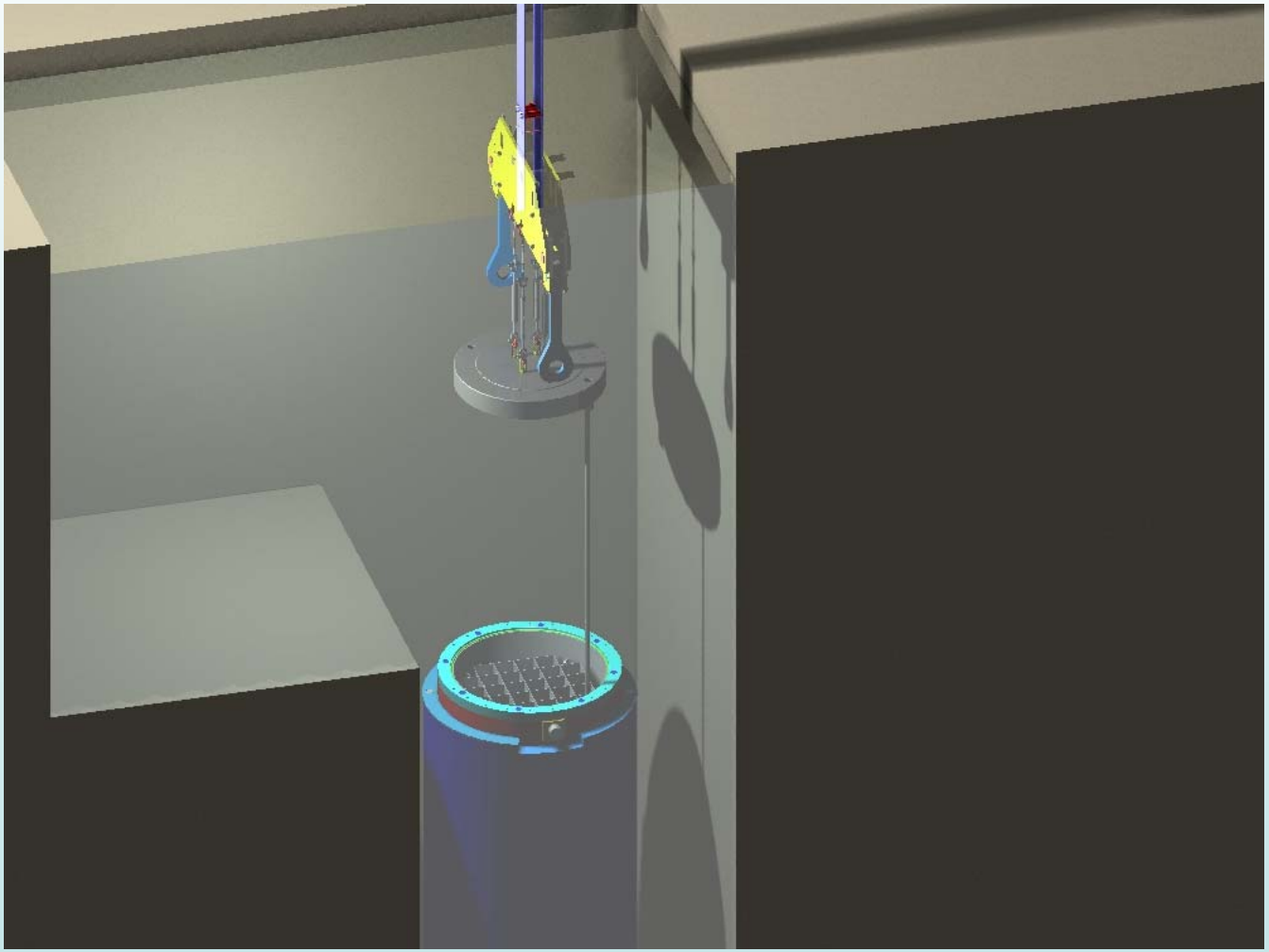




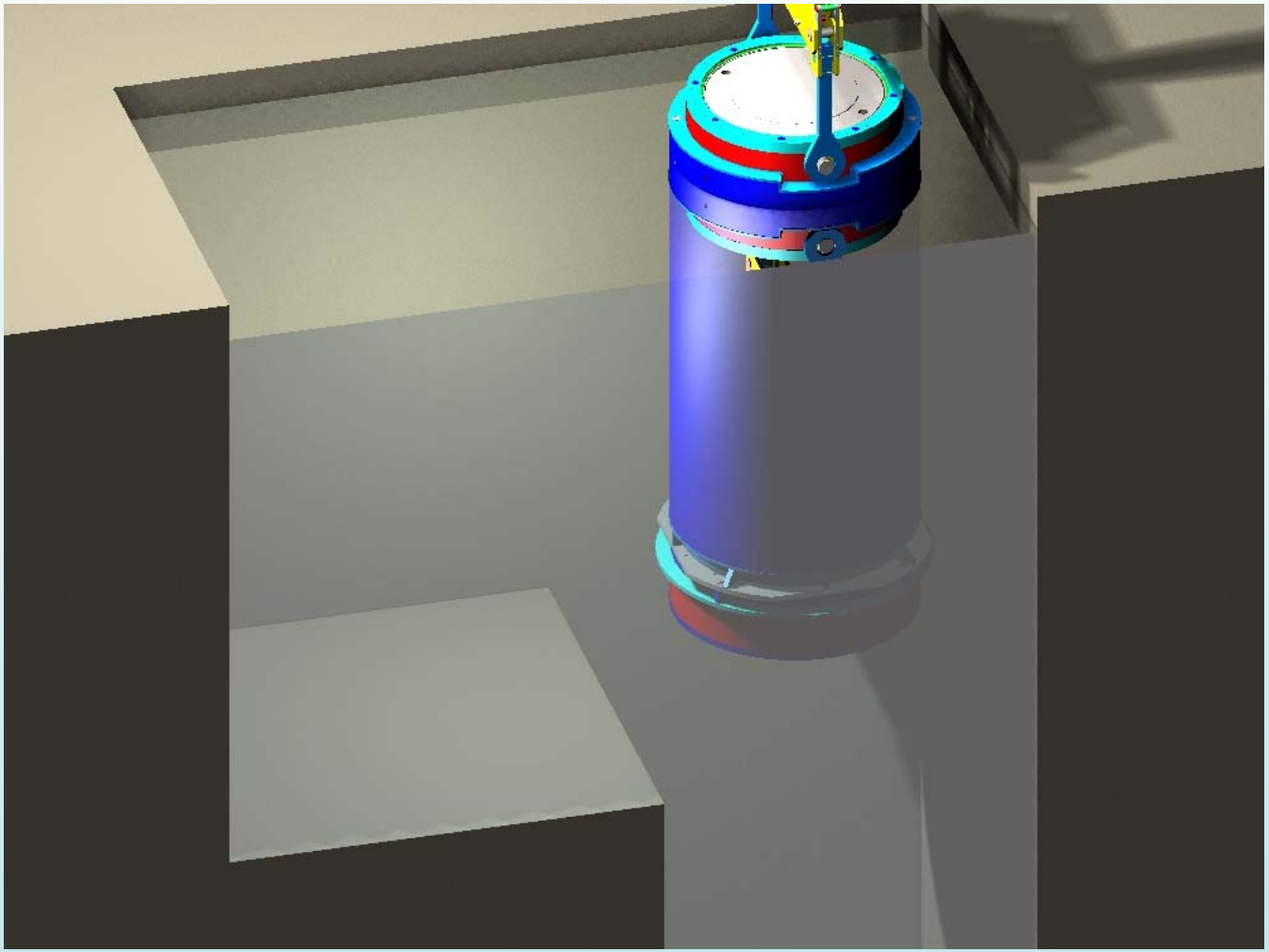
Drain Tube Attached to Canister Lid



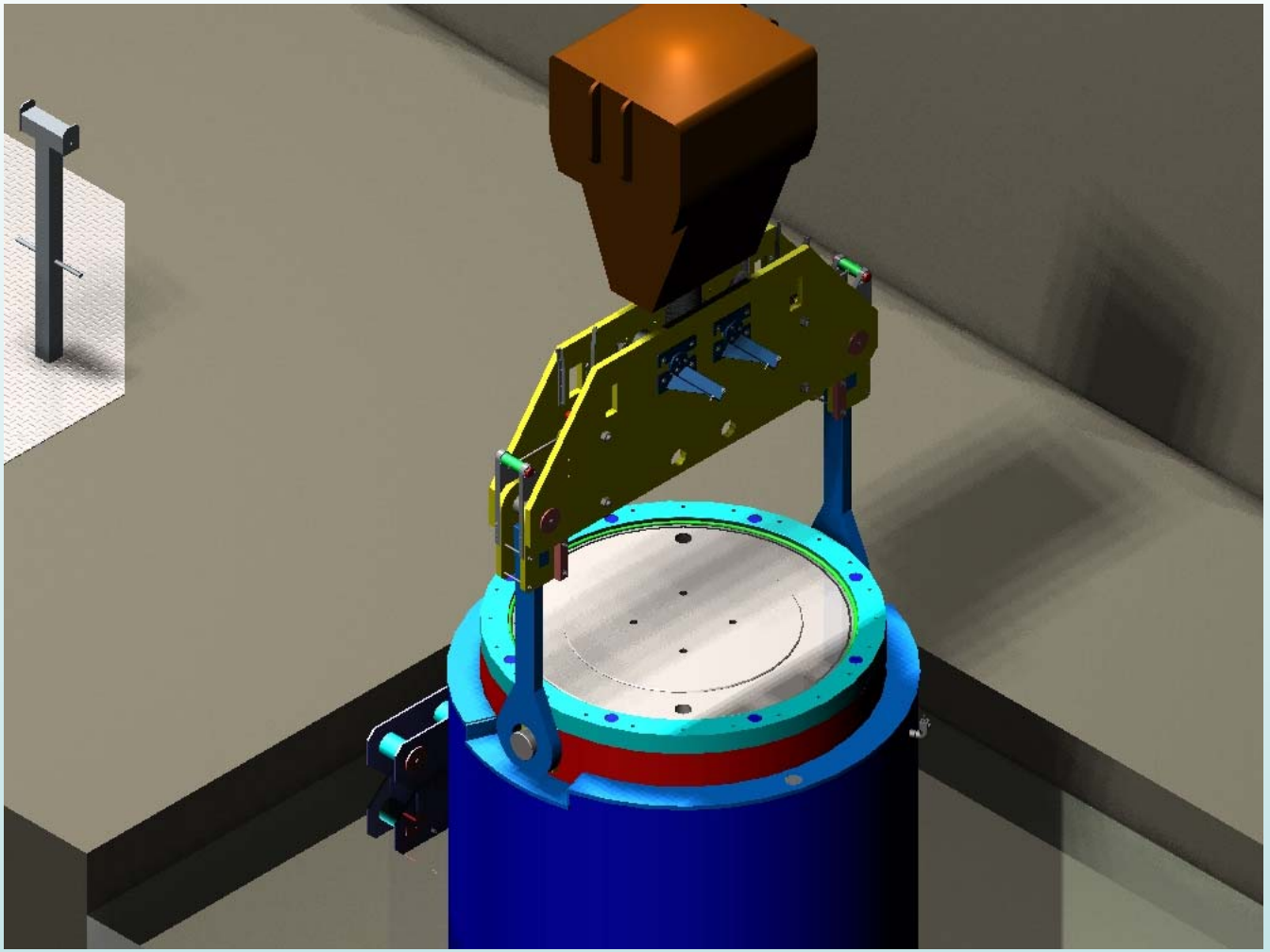
Drain Tube Aligned



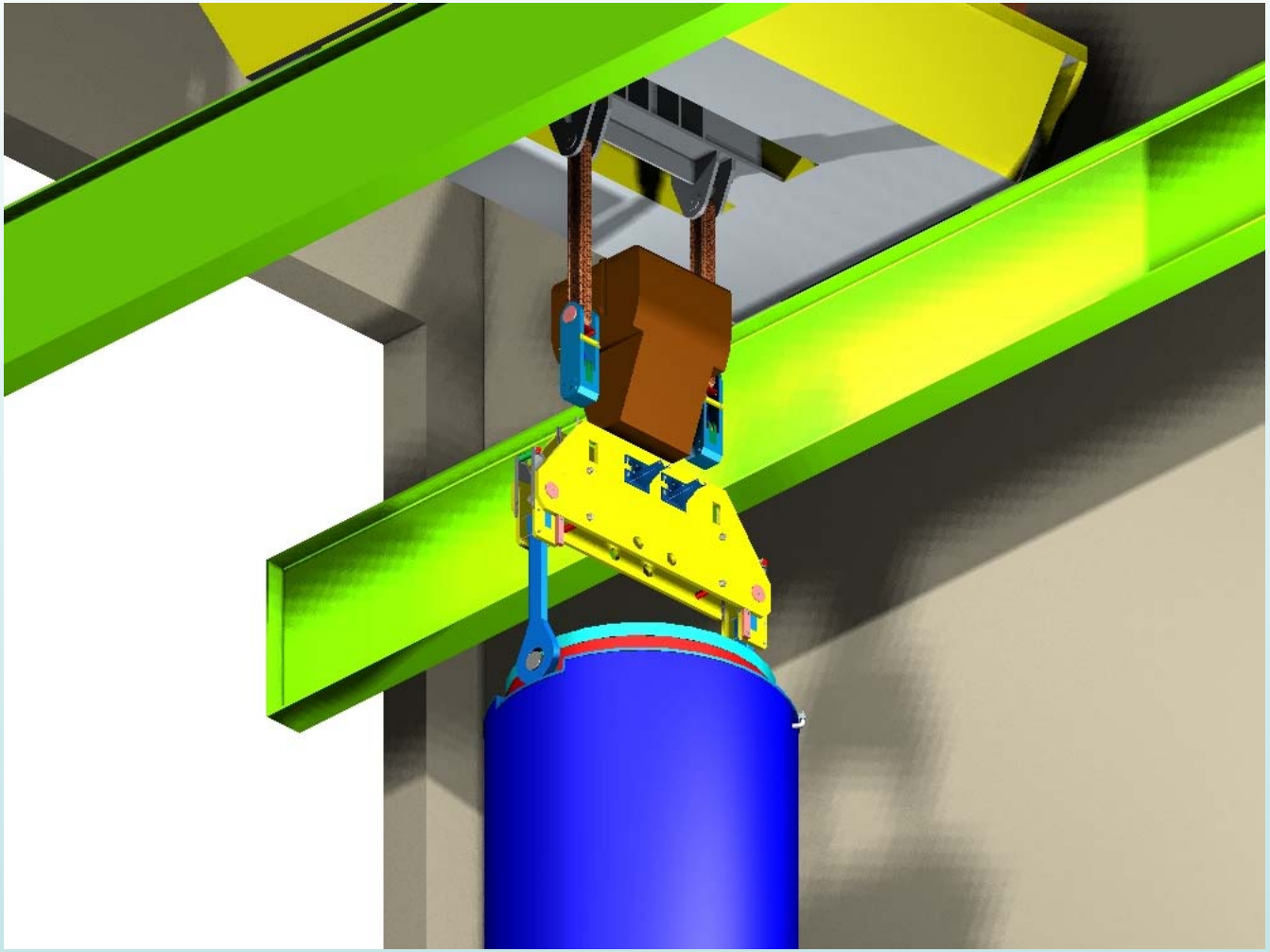
Move to Cask Pool Upper Shelf



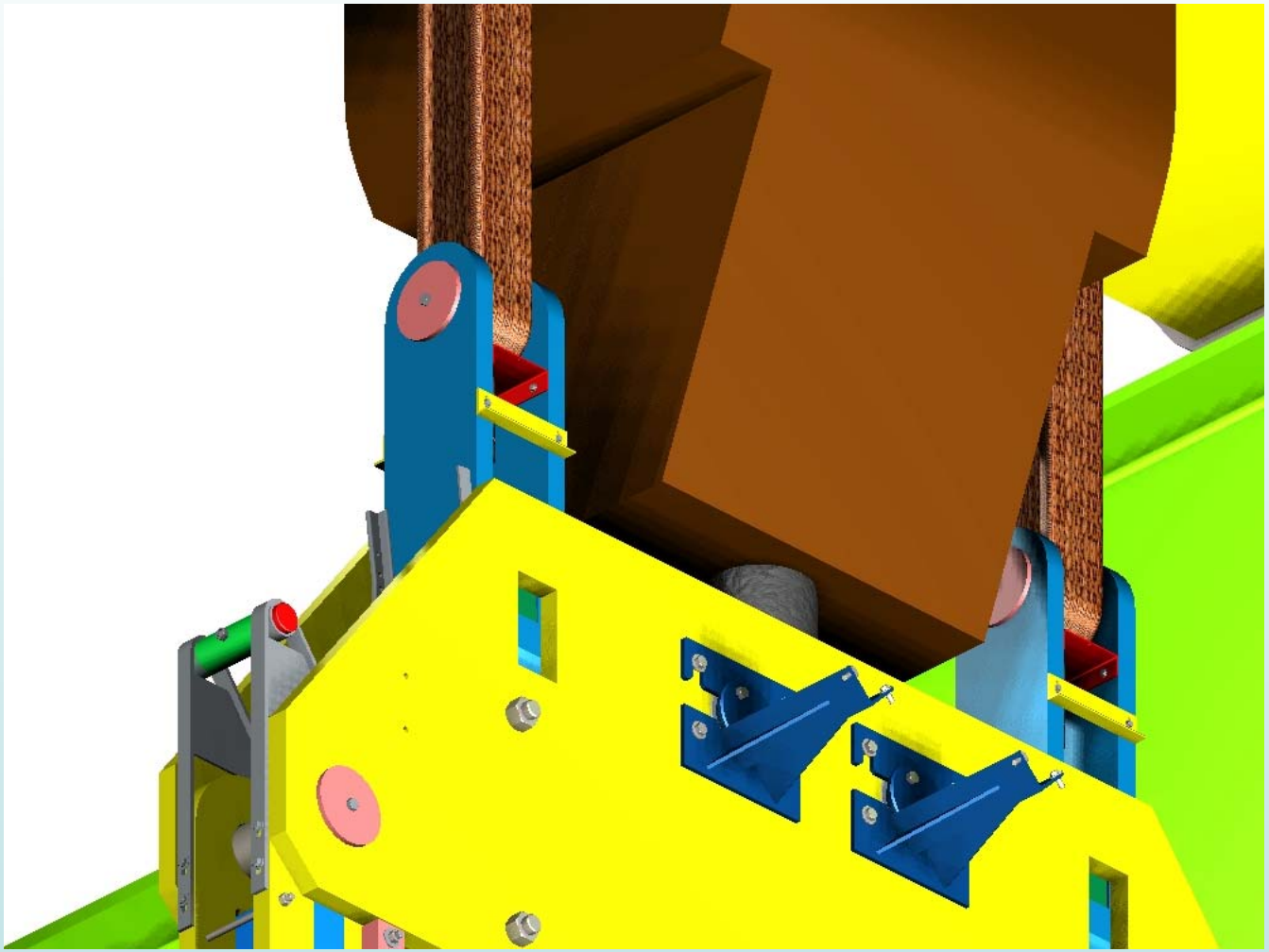
Transfer Cask Raised (Decon)



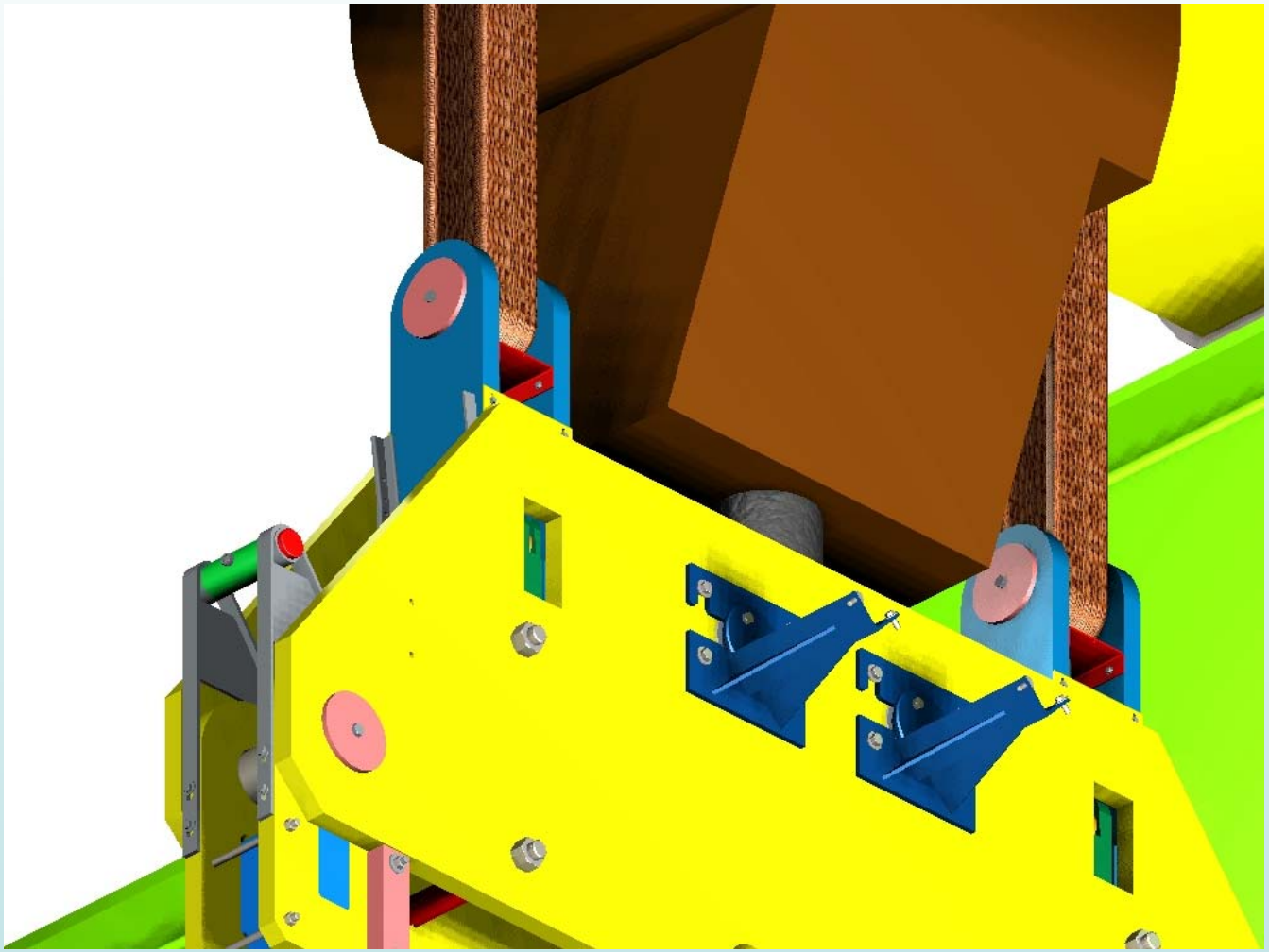
Crane Links = Redundant Rigging



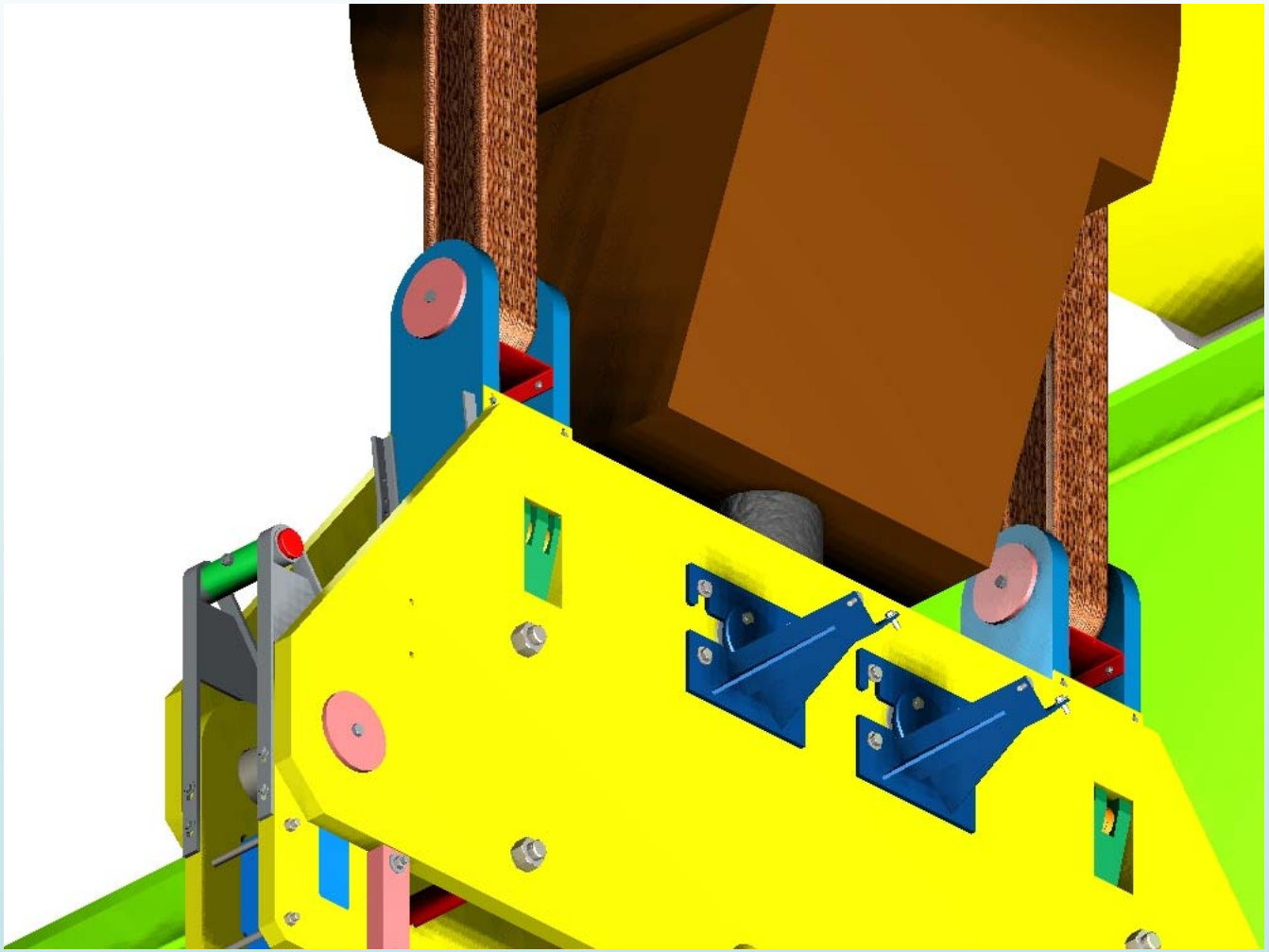
Yoke Lifts to Crane Links



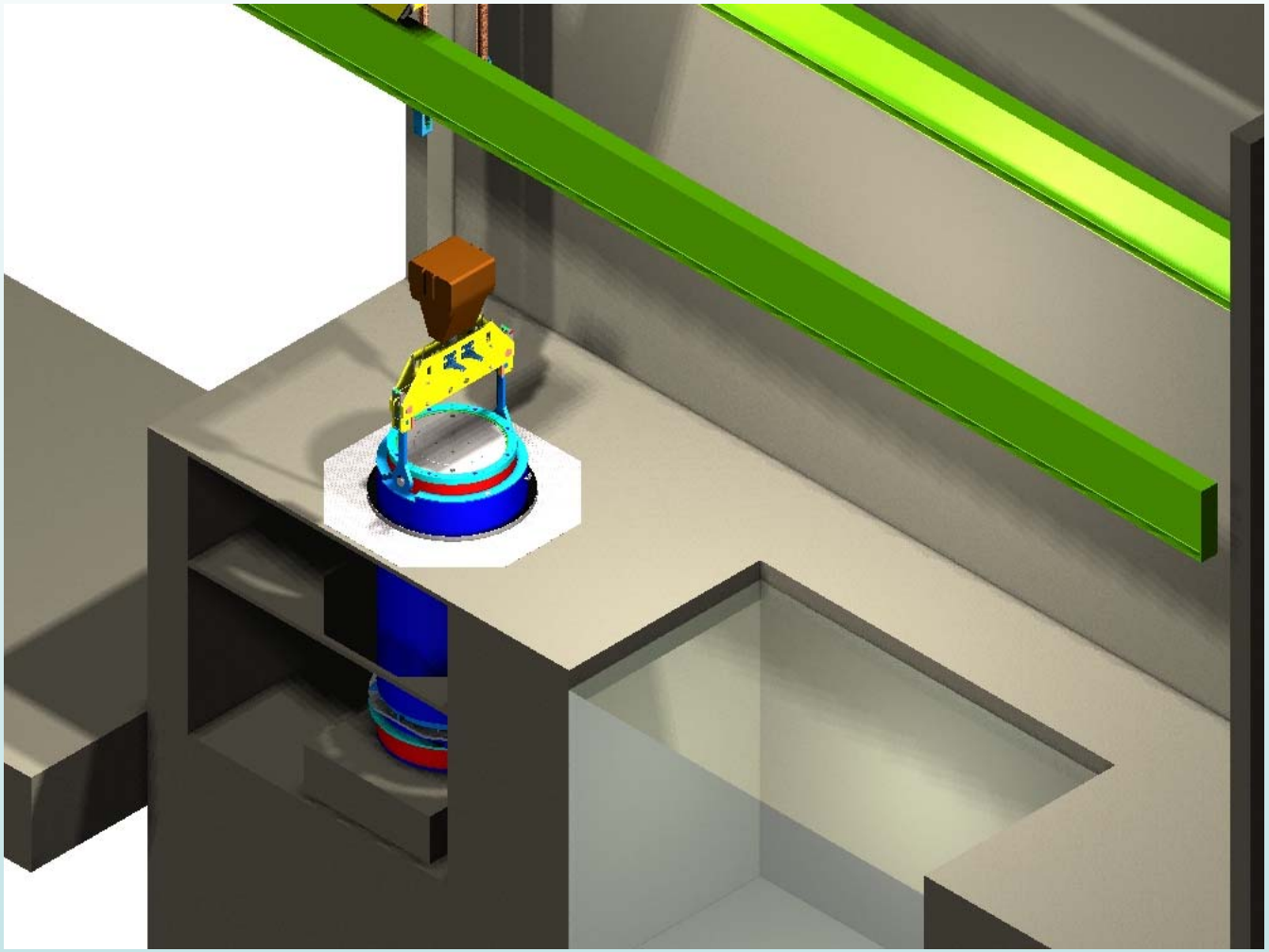
Crane Links Seated



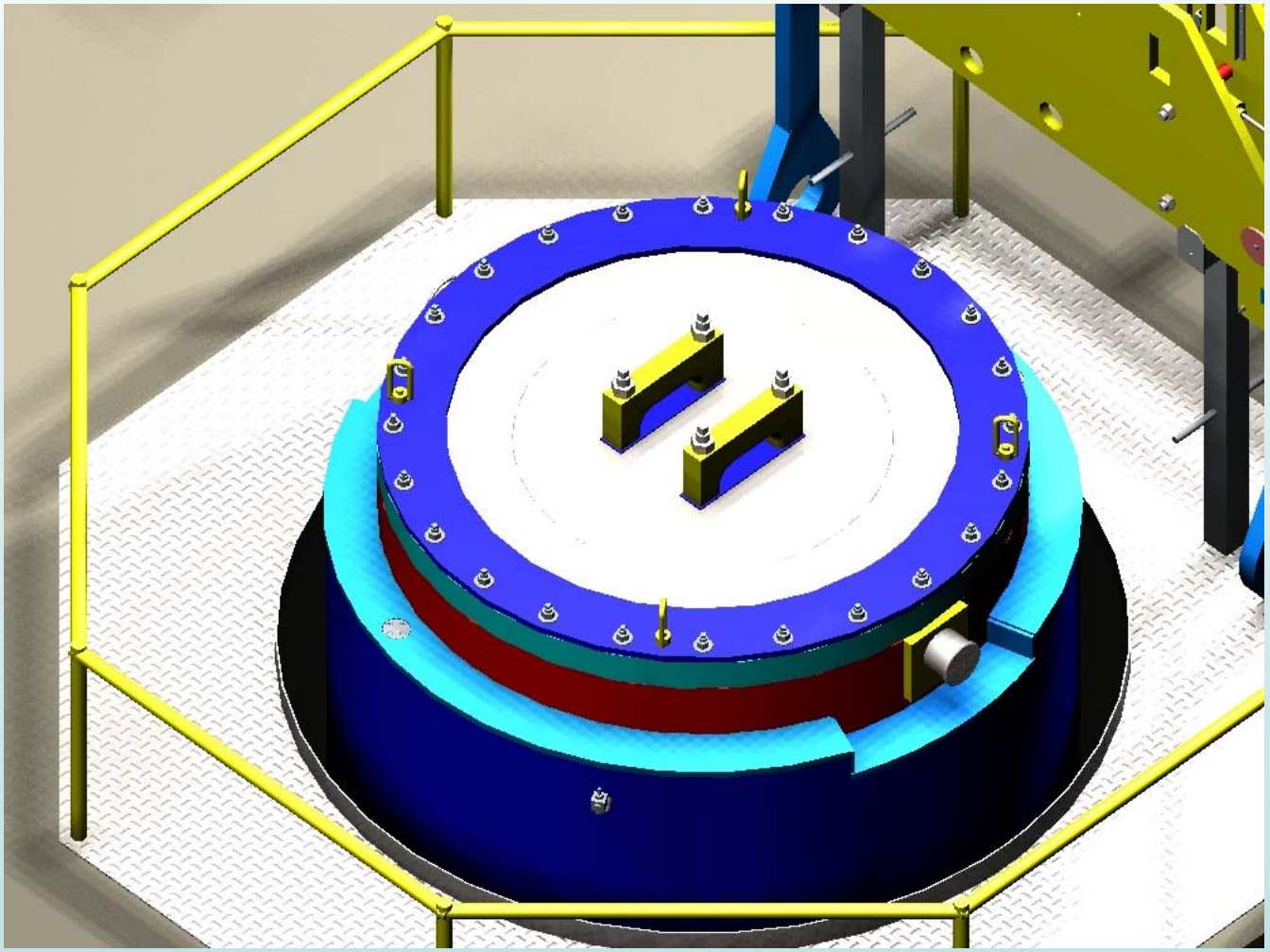
Crane Links Engaged



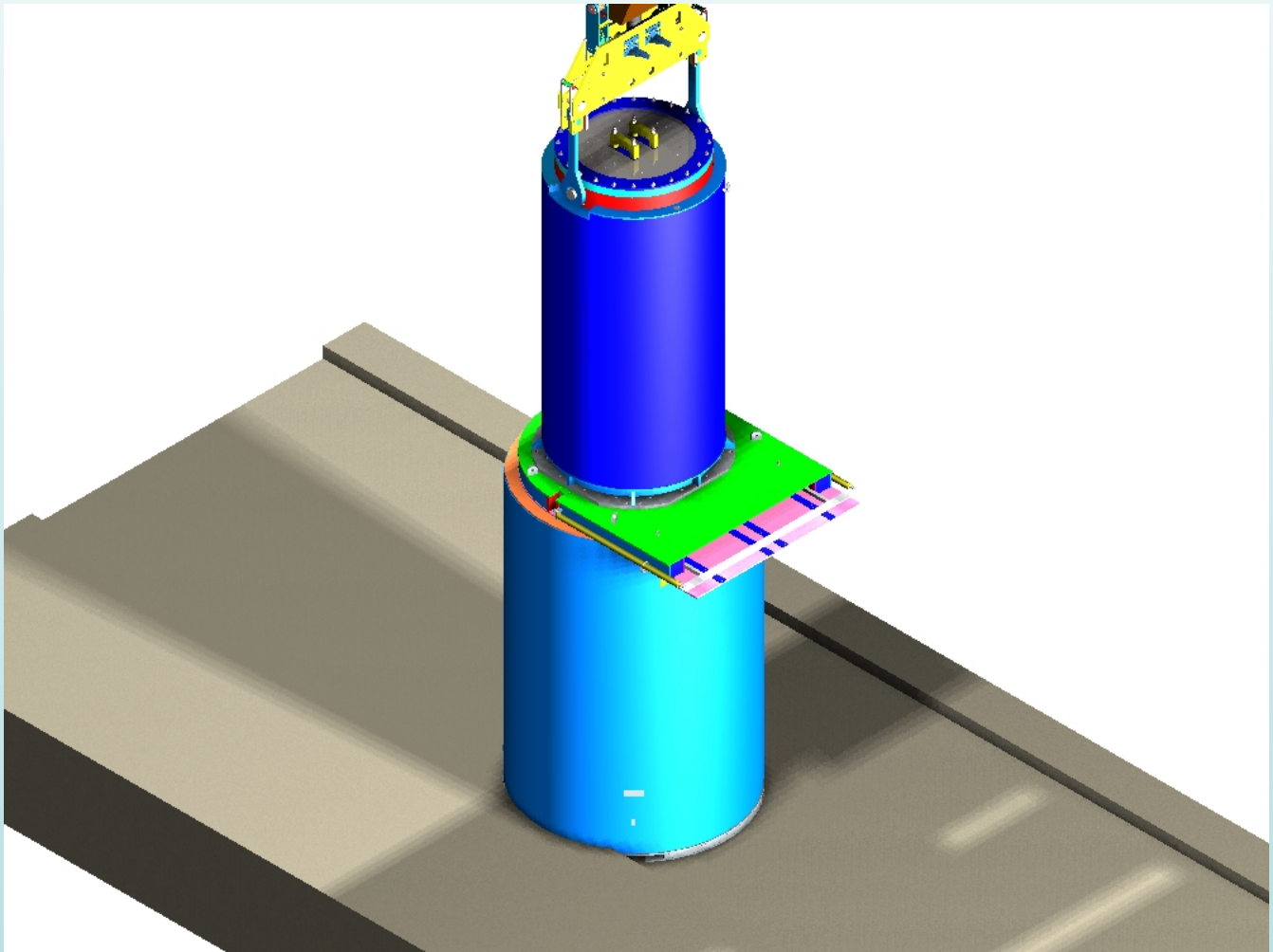
HI-TRAC moved to Washdown Pit



HI-TRAC Lid and Lift Cleats



Stackup Downloading



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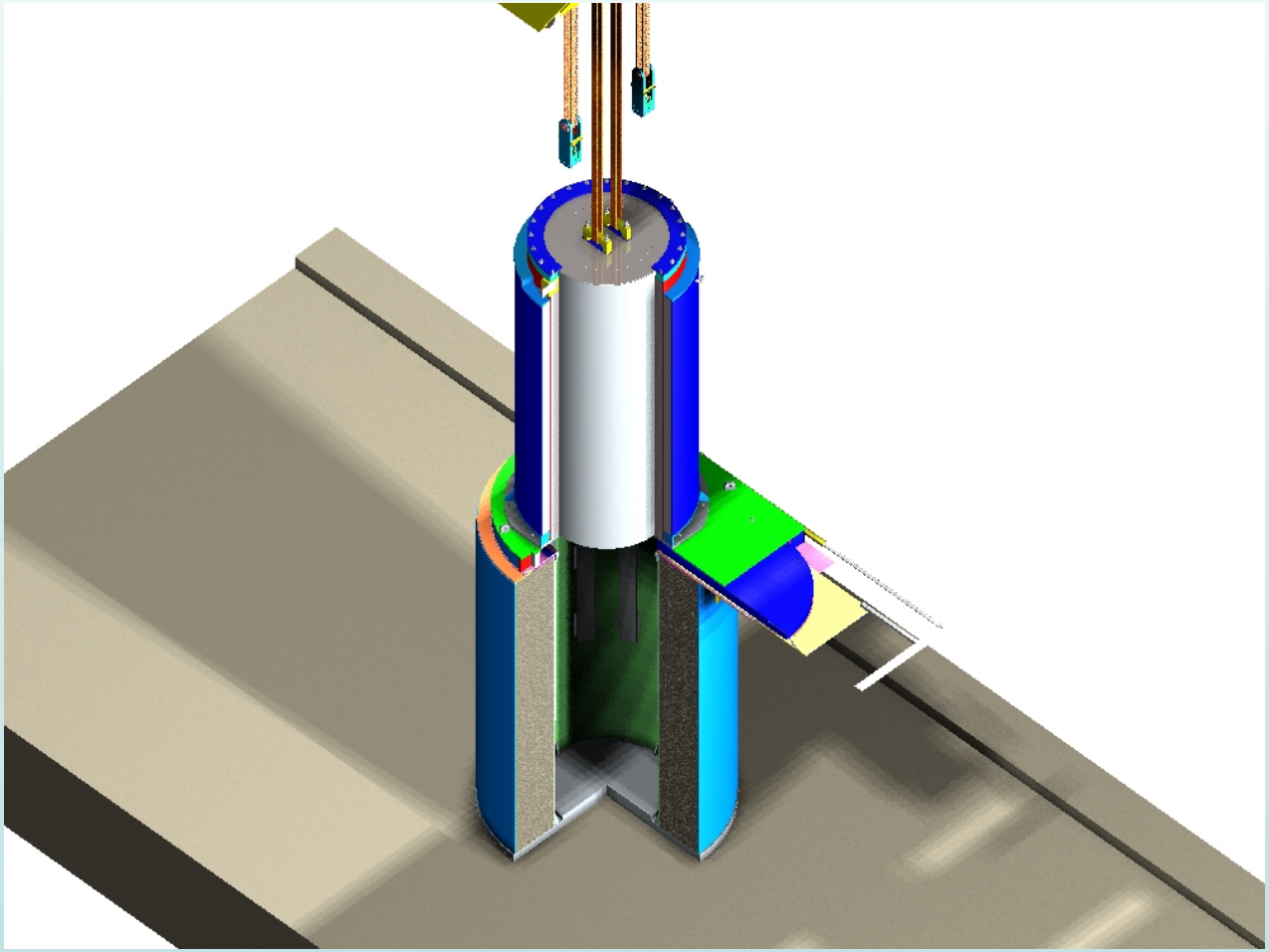

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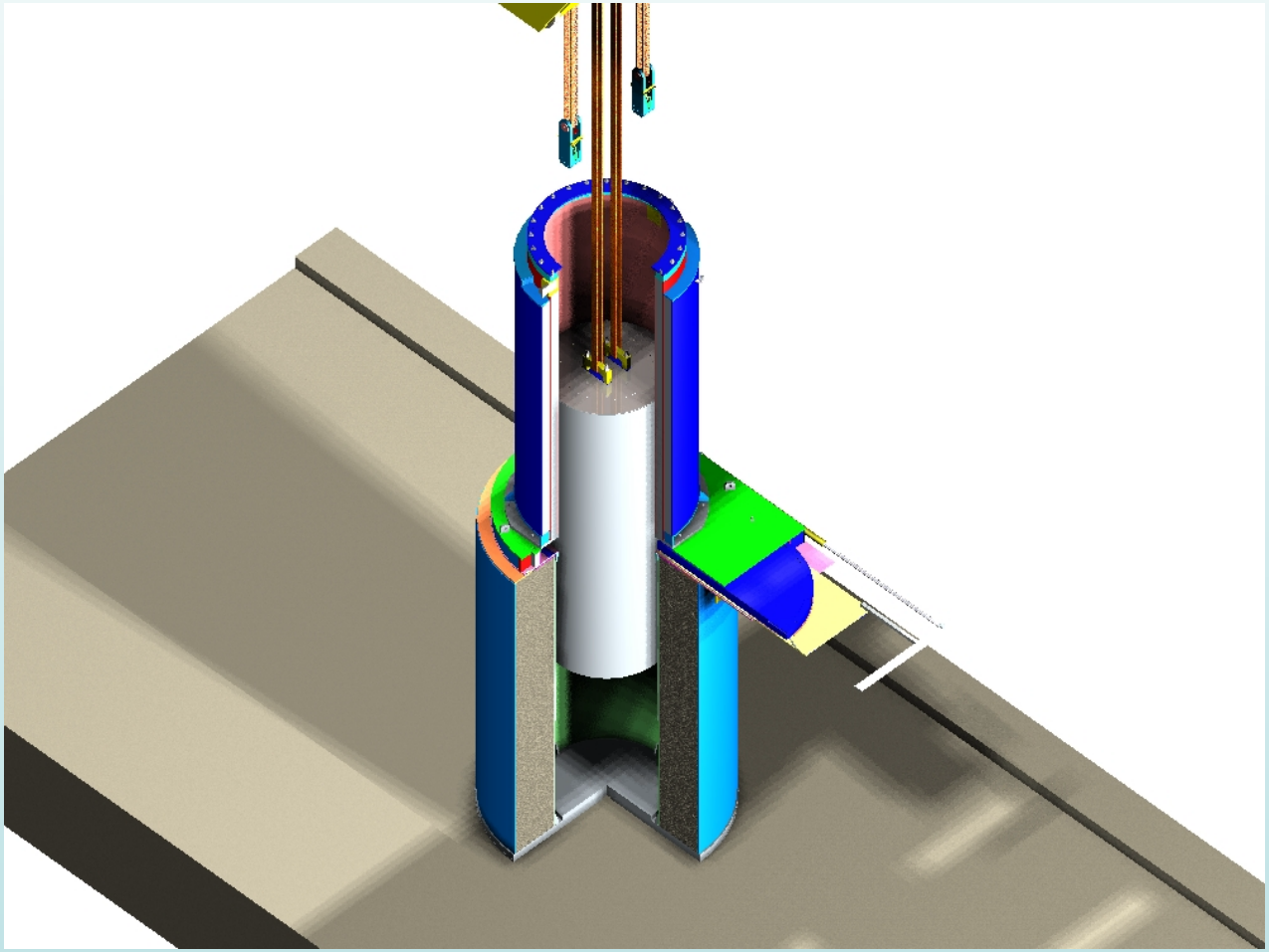
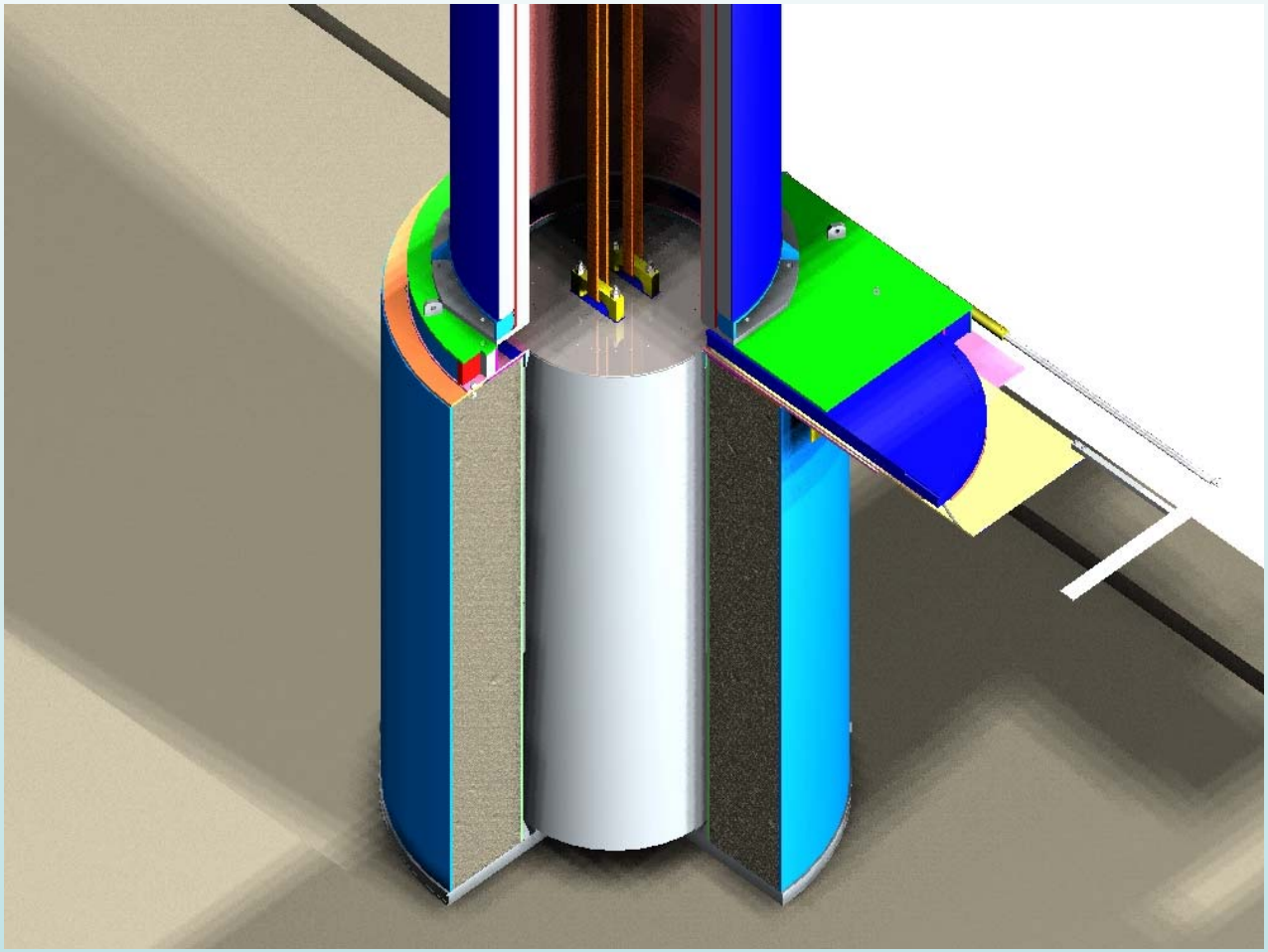
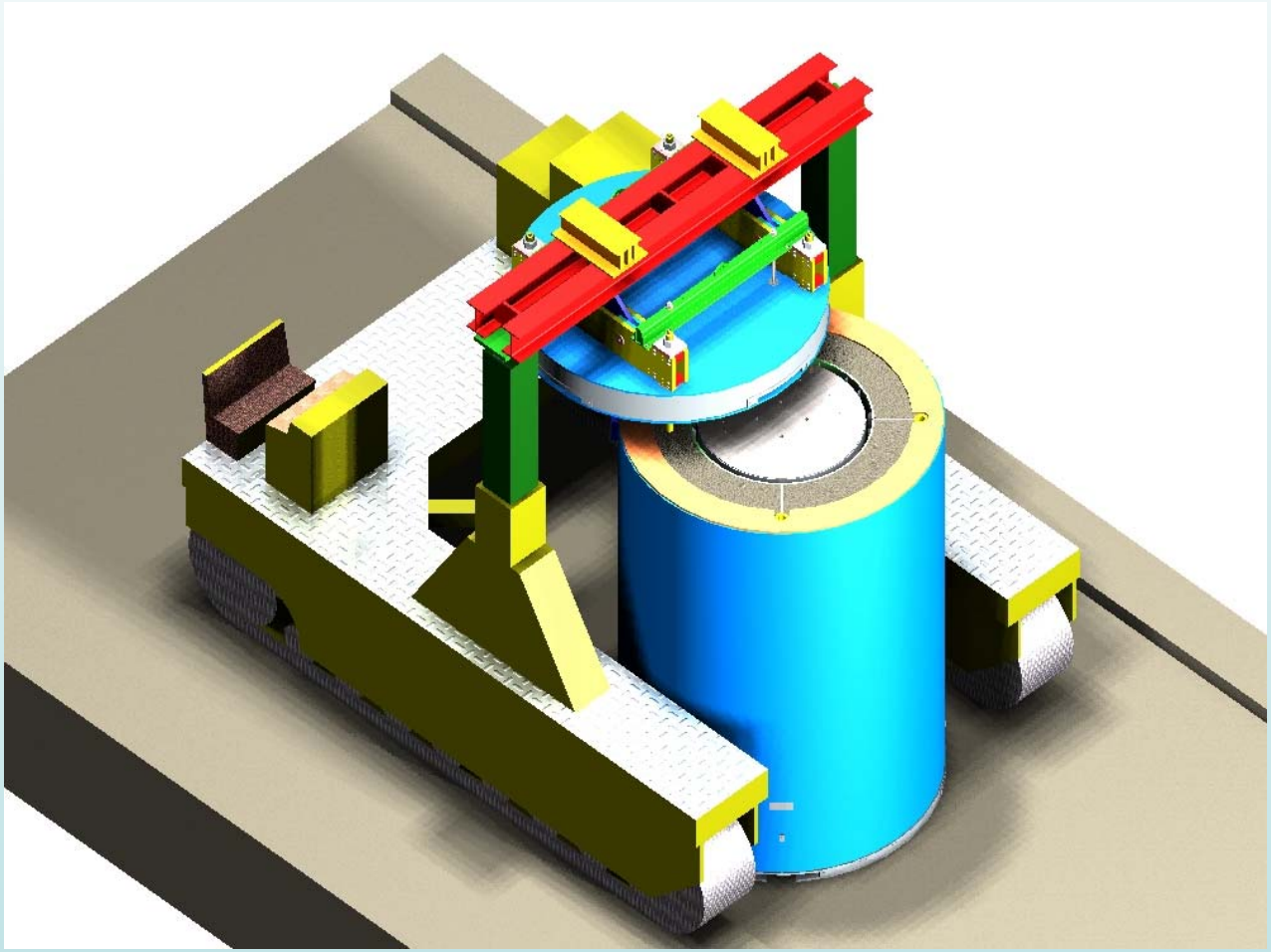


Stackup Downloading



HI-STORM Lid Rig to Crawler

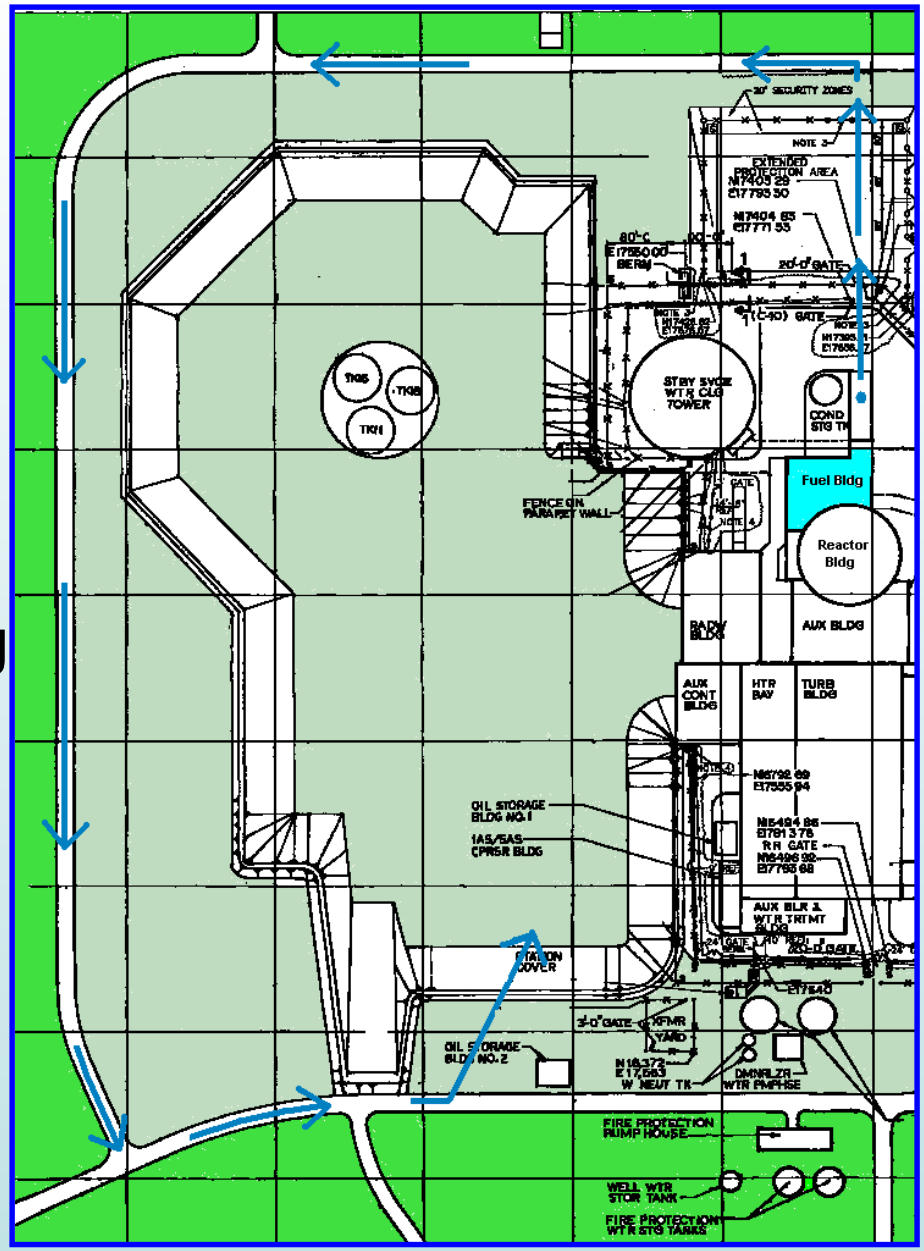


ISFSI

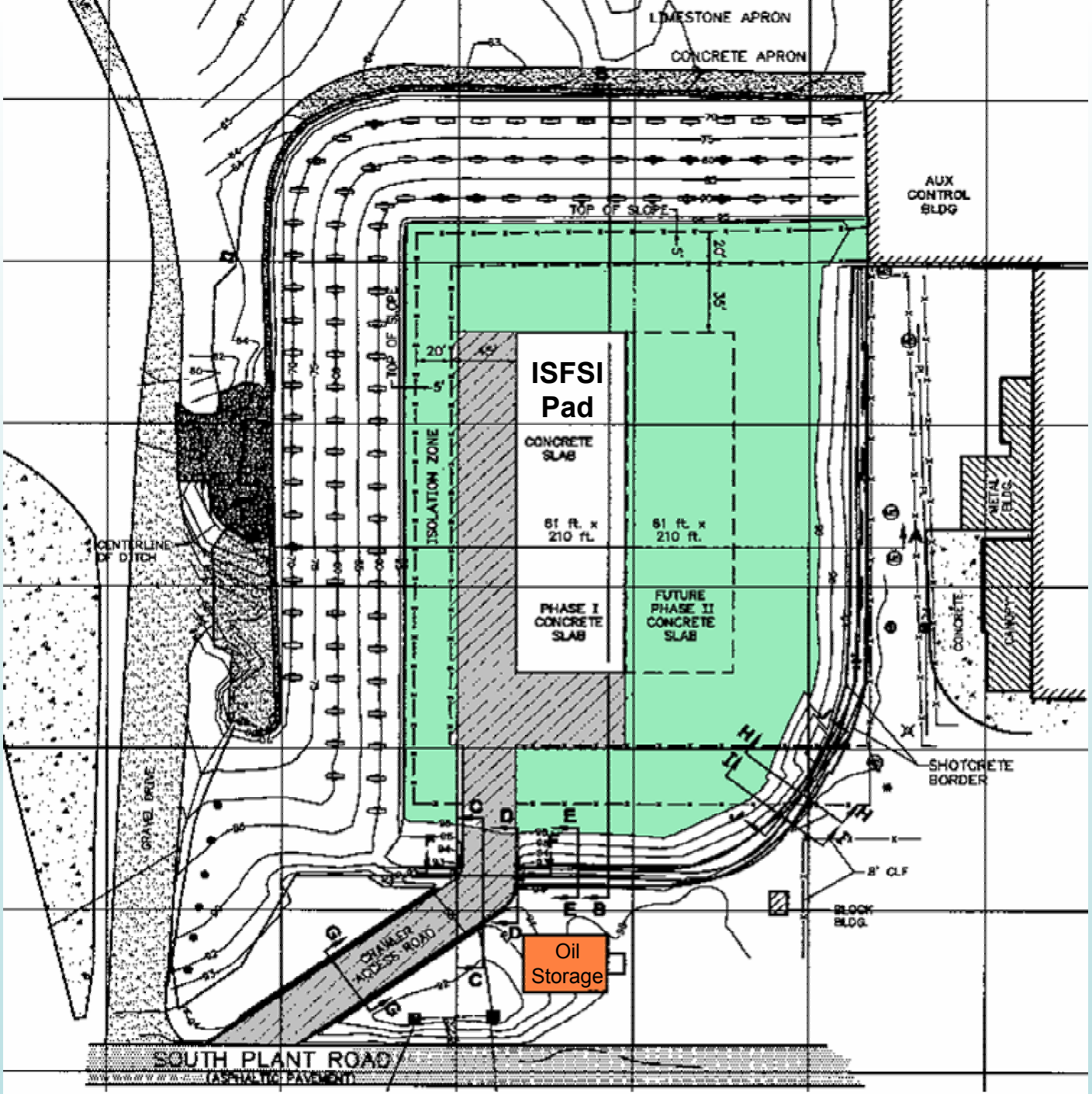
- Loaded Vertical Cask Transporter (Crawler) Path
- Pad Construction and Loadings
- Soil Backfill
- Protected Area

Loaded Crawler (VCT) Path

- Path exits and re-enters protected area
- Oil Storage Building
- Path e modulus
- Turning pads
- ~3600 ft=.68 miles or 1.36 hrs at 0.5 mph



ISFSI Pad


LIMESTONE APRON
CONCRETE APRON
AUX CONTROL BLDG
TOP OF SLOPE
ISFSI Pad
CONCRETE SLAB
61 ft. x 210 ft.
61 ft. x 210 ft.
PHASE I CONCRETE SLAB
FUTURE PHASE II CONCRETE SLAB
ISOLATION ZONE
CENTERLINE OF DITCH
GRAVEL DRIVE
CRANE ACCESS ROAD
SOUTH PLANT ROAD
(ASPHALTIC PAVEMENT)
SHOTCRETE BORDER
METAL BLDG.
BLOCK BLDG.
Oil Storage

ISFSI Soil Backfill

- Approximate Dimensions: 360 *ft x 450* ft at base
  260 *ft x 350* ft at top
  30 ft high
- *166,000* cubic yards of soil were used for ISFSI area backfill
- Fill compacted to achieve a soil modulus of elasticity between 6,000 and 28,000 psi
- Erosion control

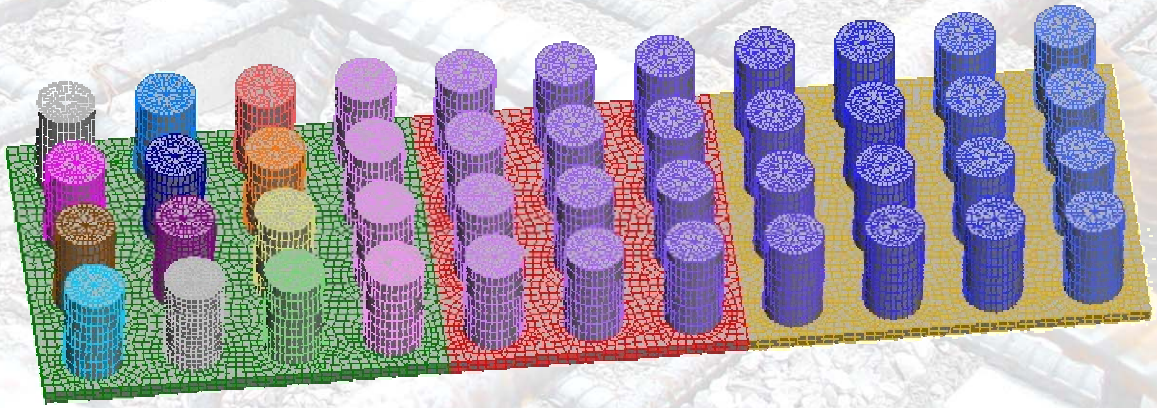
Soil Backfill Fence Modification

Protected Area

- Extend the existing part 50 protected area to include ISFSI pad
- ISFSI will be within the 1994 VBS

ISFSI Pad Design

- Dimensions: *61* ft x *210* ft
- 44 cask locations in a *4 x 11* array
- Modular design to allow for one additional pad
- Maximum number of cask locations is 88, four of which will be reserved for shuffling
- Pad placed in three sections
  - North 8/27/03
  - South 9/03/03
  - Center 9/12/03



Cask Crane

- Crane Loading
- Crane Qualification
- Cask Crane Travel Path
- Cask Crane Structure

Crane Loading

- Main hook rated at 125 tons
- Auxiliary hook rated at 15 tons
- Cask crane is not single failure proof
- Load drop analysis
- Redundant rigging (Crane Links)
- No special license conditions required

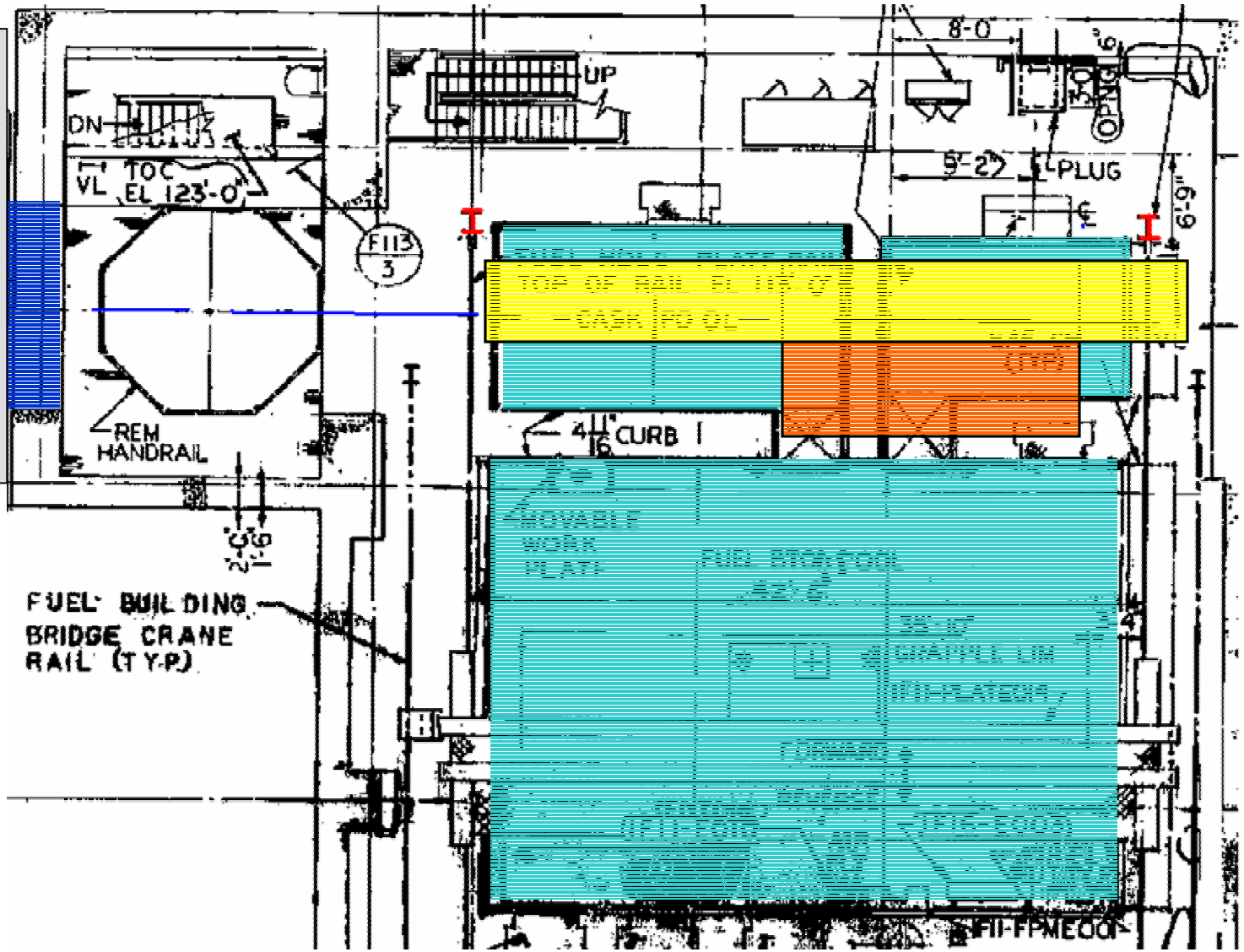
Crane Qualification

- Redundant rigging (crane links) used during horizontal moves of loaded cask
  - The links connect from the lift yoke to the cask crane
- Crane links will be disengaged to raise and lower the cask
- Impact limiter to be used when making vertical lifts which limits transfer cask impact to < 60g
- Crane travel is limited to safe load paths per NUREG-0612

Cask Crane Travel

- Moves from fuel building to cask crane structure
- Can not move over Spent Fuel Pool
- 125 ton cask drop acceptable per original licensing basis NUREG-0612 evaluations

Cask Crane Travel



Cask Crane Structure

- *Part 50 structure*
- *Canister downloading outside of Fuel Building*
- *Clearance for crawler and casks*

Communications Plan

- Public information shared
- Public information planned

RBS Dry Fuel In the News

- **May 13, 2001** *The Advocate*, Baton Rouge, LA Packed Away This detailed article clearly described Dry Fuel Storage planned facility and process at River Bend.

- **January 18, 2001** WBRZ Channel 2 News coverage aired discussing Dry Fuel Storage at River Bend Station.

- **December 17, 2000** *Times Picayune* New Orleans, LA Mountain of Controversy (Yucca Mountain), communicates River Bend's intent to use storage canisters, and that construction of the outside concrete storage area had begun.

There have also been minor references to RBS Fuel Storage in *The Advocate* urging Louisiana consideration and support of the facility at Yucca Mountain. An example is We Can't Sweep Waste Under the Rug published Feb 28, 2002 which mentions, "Louisiana's two nuclear power plants both store their spent fuel on site."

Public Meetings

- **April 1, 2002** Emergency Preparedness planning meeting. Dry fuel storage was discussed. 5 Parish Directors, State of Louisiana LOEP (Louisiana Office of Emergency Preparedness) and LDEQ (Louisiana Department of Environmental Quality). This meeting was reported in two newspapers (April 2 and April 5), but Dry Fuel Storage was not mentioned in the articles.

- **May 2001** Rotary Club Meeting presentation on River Bend Station Dry Fuel Storage.

- **March 24, 2001** Meeting with ERO Parish Leads. Introduction to River Bend Station's Dry Fuel Storage.

- **January 9, 2001** Women In Nuclear (WIN) meeting. Introduction to dry cask storage plans at River Bend.

- **February 17, 2000** Louisiana Board of Contractors. This presentation obtained approval for a deviation in the bidding process in regard to a contract for the design and construction of dry fuel storage facilities at RBS.

- Community Meeting with Local Councilmen and interested parties. Introduction to dry cask storage plans at River Bend.

Public Information Planned

- *Continue to inform Community Leaders and Key Stakeholders*
- *Introduction to Dry Cask Storage at RBS*
  - *Mayor of Saint Francisville*
  - *Police Jury*
  - *Chamber of Commerce*
  - *Local Councilmen*
  - *West Feliciana Parish Entergy Retirees*

Comments & Feedback

River Bend Canisters & Concrete

The Times-Picayune

"For two decades, power plants have been storing nuclear fuel that is no longer useful in large pools …" "… power plants are increasingly filling their pools and turning to large outdoor canisters to hold the extra waste."

A photo shows a row of ANO's VSC-24s and notes that a foundation for similar canisters is under construction at Entergy's River Bend plant.

"When the pool is completely filled, the plant [River Bend] will begin storing rods in 19-foot-tall concrete and steel canisters sitting outside the reactor [building]. Work already has started on the concrete foundation … "

"The dry-storage containers that will store waste at River Bend once the plant's waste pool is filled will cost Entergy about $5 million a year to maintain, company spokeswoman Diane Park said."

"Similar containers [to those River Bend will use] are already in use at Entergy's Arkansas Nuclear Power Station in Russellville, Ark., which exhausted its storage pool four years ago."

"Already, more than a dozen nuclear plants across the country are using 150 containers for storage."

Mountain of Controversy (Yucca Mountain), *Times Picayune* New Orleans, LA Dec. 17, 2000 (Return)

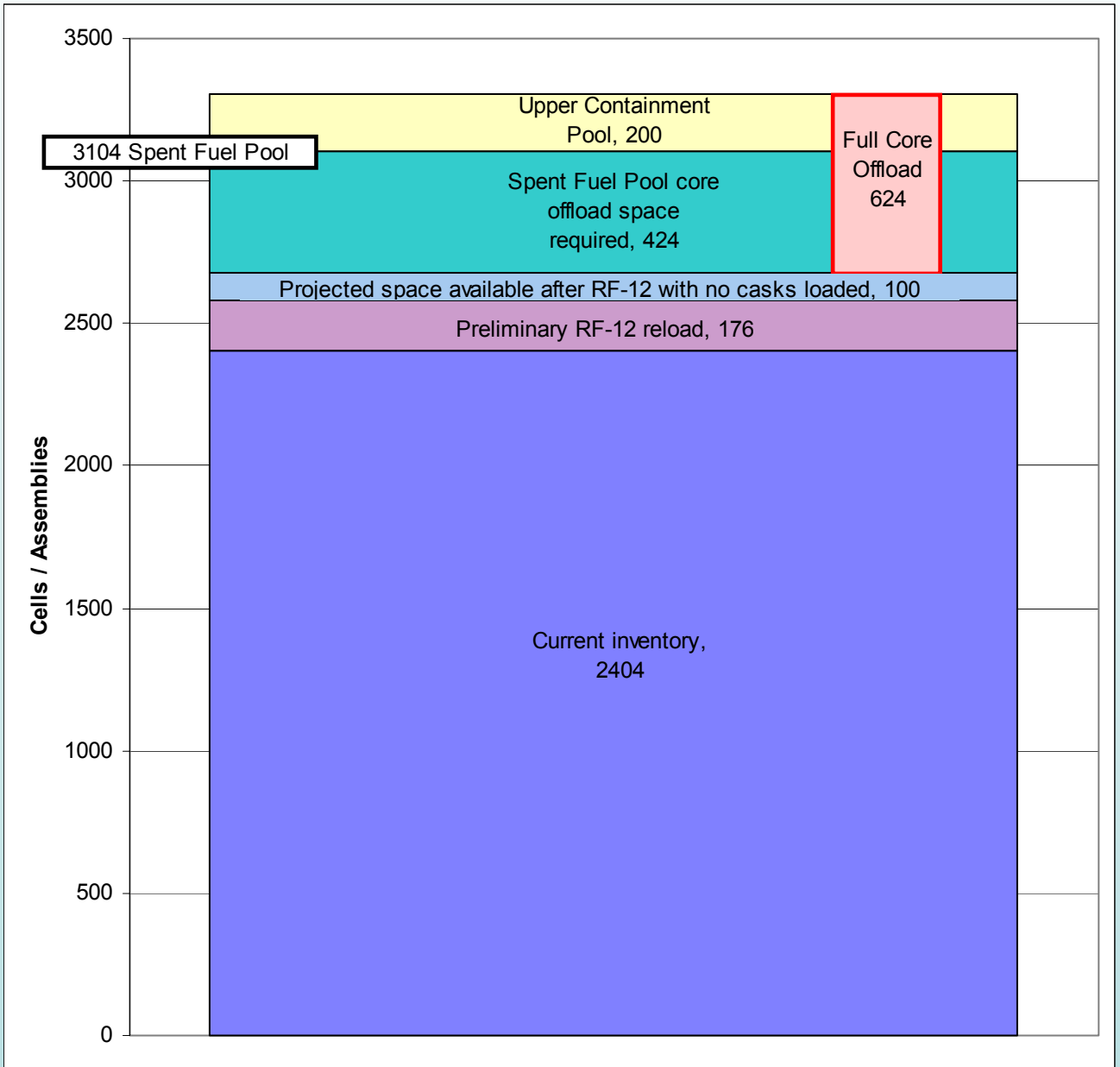
Details Made Public

River Bend's planned storage facility and process

- A stainless steel canister with a built-in grid to hold the fuel assemblies will be placed inside a transfer cask, a smaller version of a storage cask, and both will be lowered into an area of the spent fuel pool and filled with water.
- While remaining under water, 68 selected fuel assemblies will be lifted by a special crane above the pool and placed in the stainless steel canister. The resting place for each assembly will be predetermined by its age to distribute the heat load.
- A lid will be put on the canister, and the entire load will be lifted out of the pool by an overhead crane. The lid will then be welded in place.
- The crane will then move the transfer cask and its canister of spent fuel through huge doors on the fuel building and place them on top of the "storage overpack," the larger metal-and-concrete storage cask.
- The transfer cask has a removable bottom, which will allow workers to lower the inner canister into the storage cask without exposing the workers to radiation.
- A motorized crawler-type vehicle will deliver the cask to the storage pad.

Packed Away, *The Advocate* Baton Rouge, LA May 13, 2001 (Return)

Spent Fuel Inventory



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