



Idaho National Laboratory SNF Management: Activities and Plan, Part II

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August 29, 2024



Idaho National Laboratory SNF Management: Activities and Plan, Part II



IDAHO

INL SITE



IDAHO 
CLEANUP PROJECT

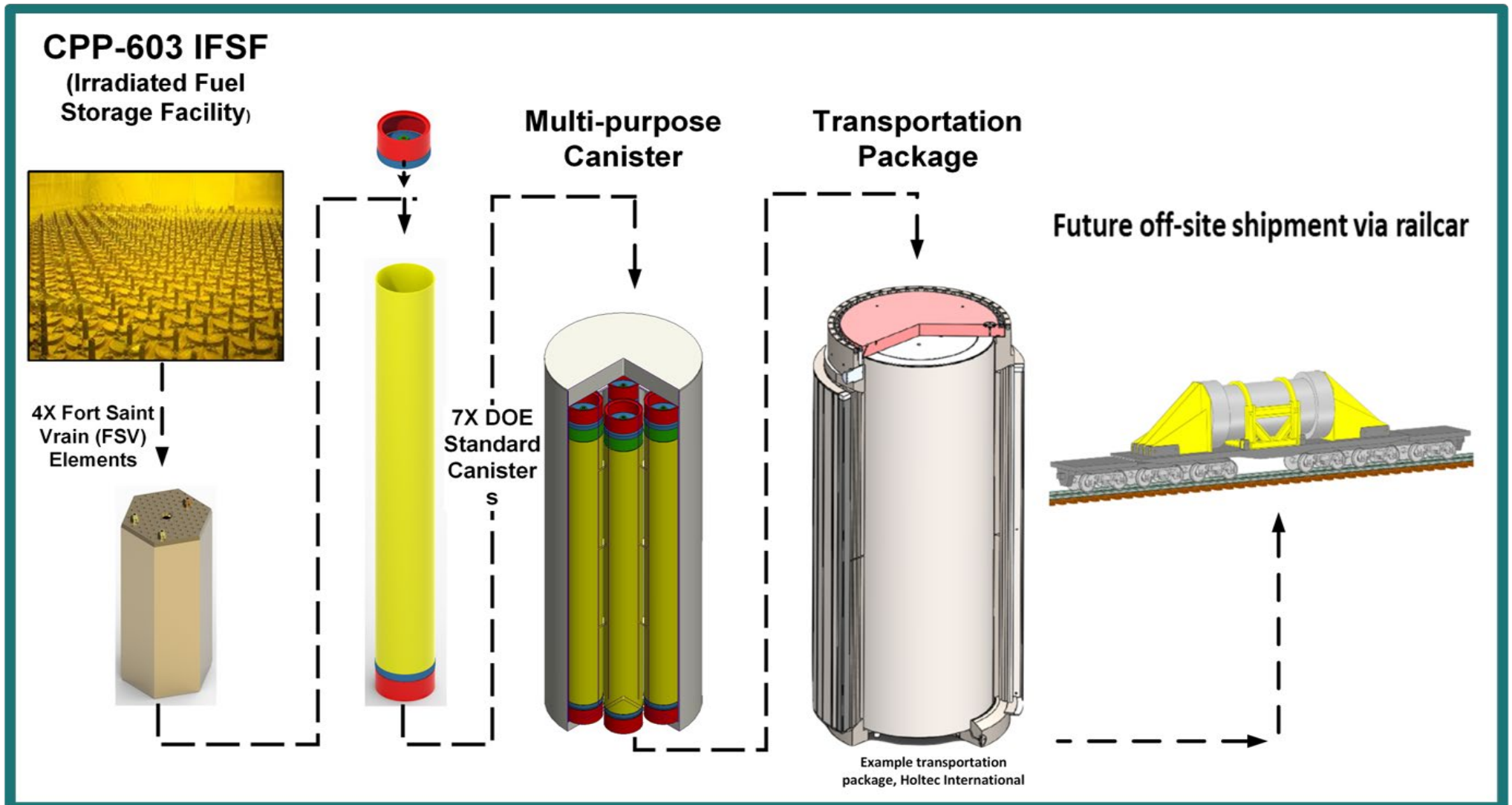
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- CPP-603
 - Built in stages between 1952 and 1974
 - Temporary SNF storage
 - Irradiated Fuel Storage Facility (IFSF) added in 1972-74
 - Location of Road Ready Packaging at INTEC



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- Demonstration Project: Single SNF Package per DOE-EM “Road Ready” definition
 - Definition currently being developed by DOE-EM
 - SNF in a configuration that is transportable AND disposable



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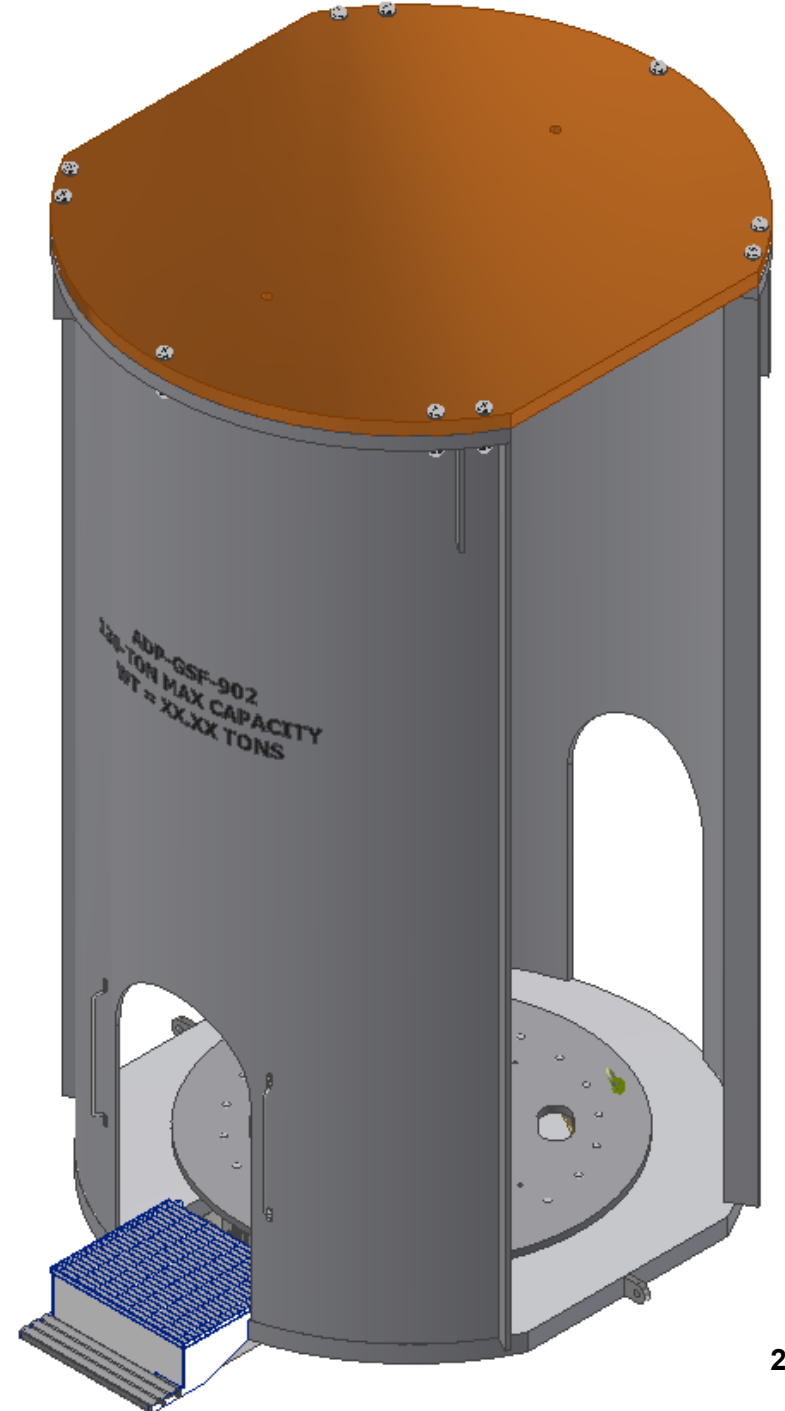
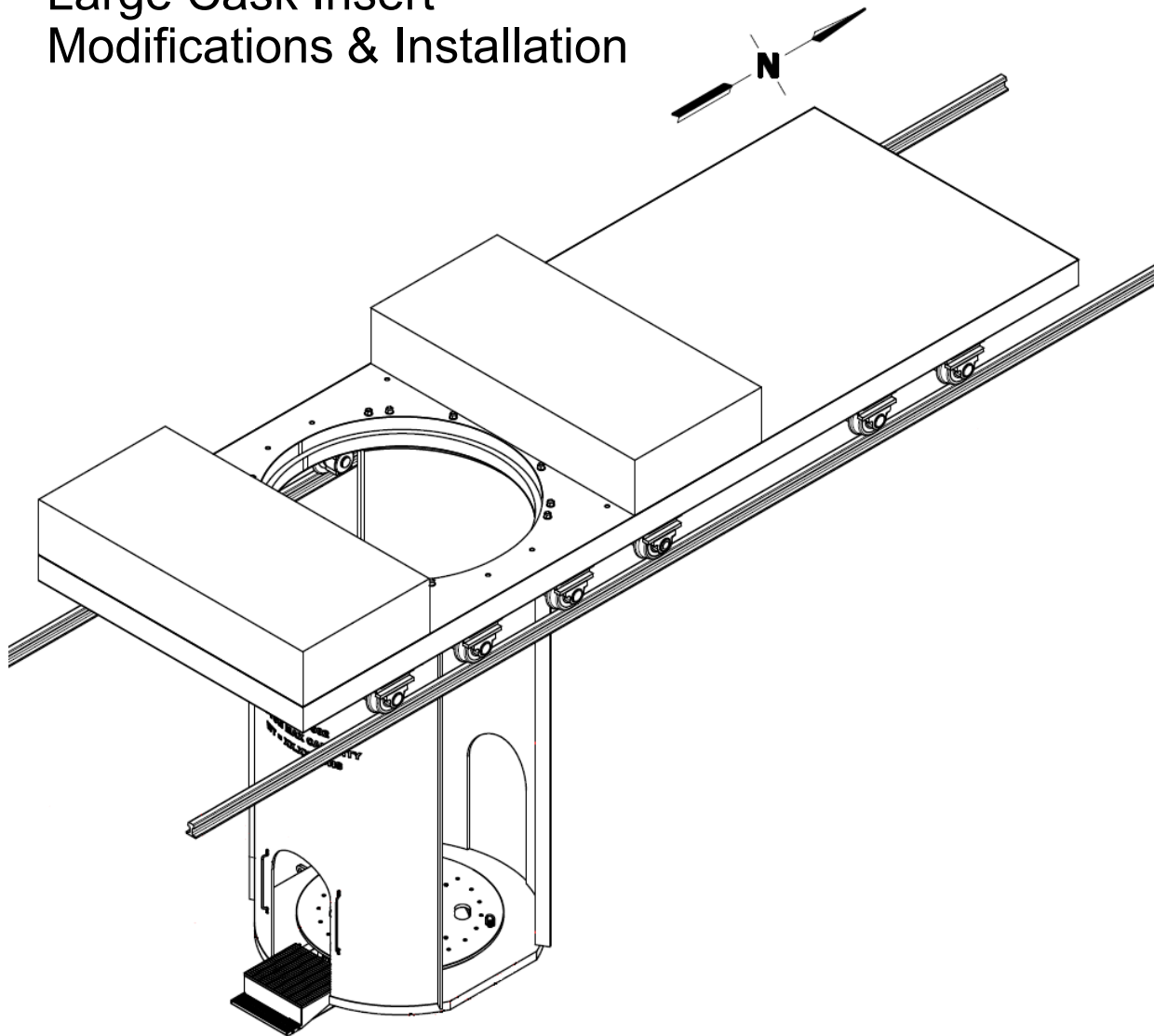
- Demonstration Project Scope
 - Facility modifications to CPP-603
 - Develop Road Ready Package Transportation
 - Develop DOESC closure technology (INL)
 - SNF “data package” for disposal
 - Single SNF road ready package

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- CPP-603 Facility Modifications
 - Large Cask Insert Modification & Installation
 - West-Truck Ramp Fill-in & Analysis
 - Permanent Containment Structure re-build
 - Various engineering analyses and modifications needed for cask handling & operations
 - Hot Cell camera system upgrade
 - Miscellaneous process equipment

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- Large Cask Insert Modifications & Installation



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- Permanent Containment Structure (PCS)



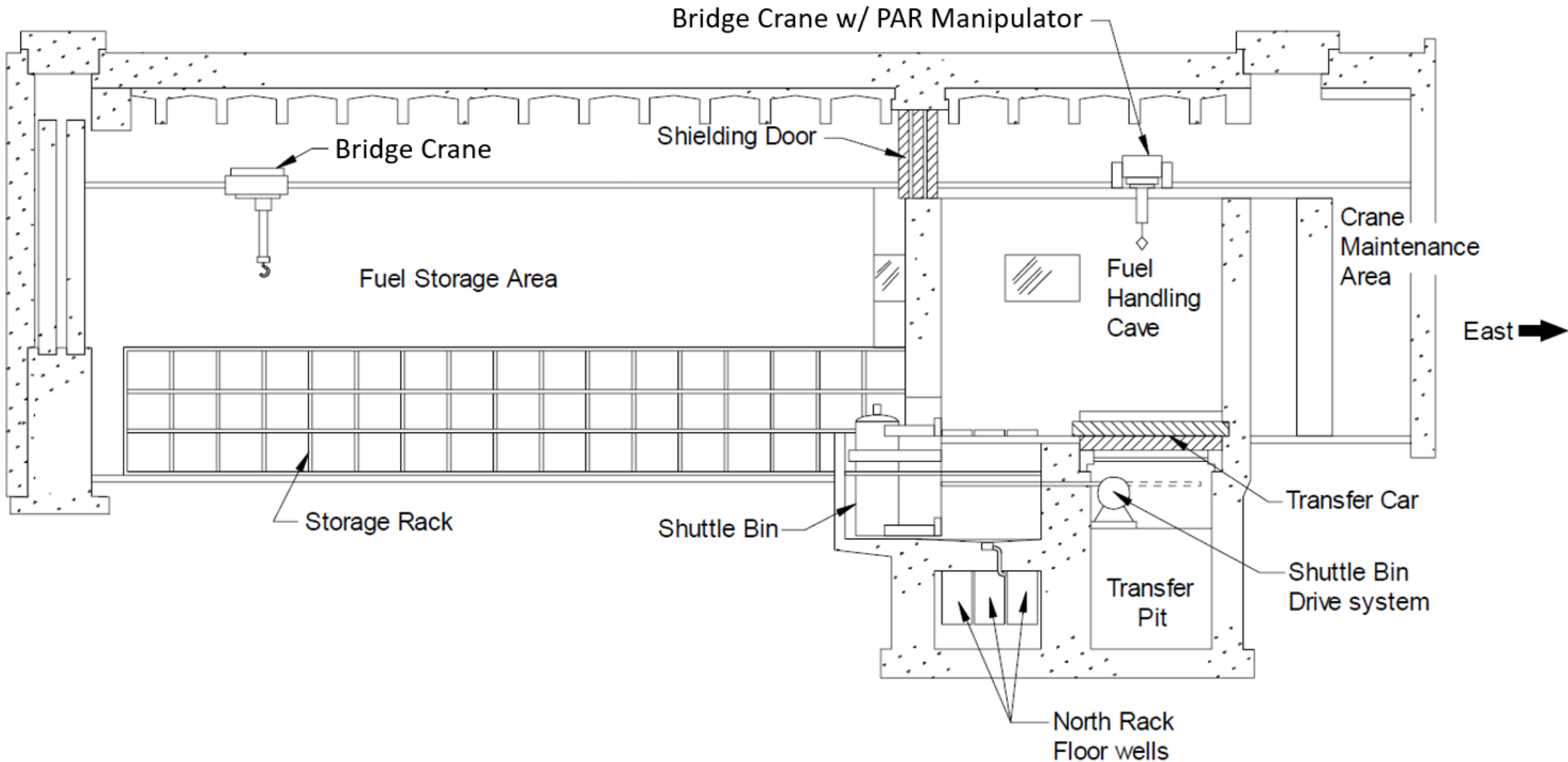
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- Package Transportation
 - Transportation method has not been developed
 - IEC planning to partner with Commercial Vendor
 - DOESCs within an MPC
 - MPCs transported using existing Type B shipping containers that are already NRC licensed
 - Existing Certificate of Compliance Amendment



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- Packaging Process – facility layout



Conceptual SNF Road Ready Packaging In The Irradiated Fuels Storage Facility

3/12/2024



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- SNF Staging Facility – Capital Project Underway @ INTEC
 - Staging Facility mimics Independent Spent Fuel Storage Installations (ISFSI)
 - Benefits to the environment
 - SNF is conditioned for disposal
 - Reduces SNF inventory in legacy DOE facilities
 - Facilitates SNF disposal



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- Shipments to Geologic Repository
 - Infrastructure needed
 - Rail spur & associated equipment
 - NRC CoC





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Questions?



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Supplemental Slides

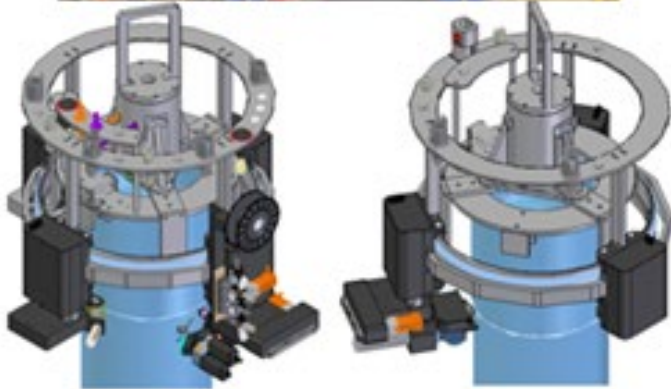
Acronyms List

ATR – Advanced Test Reactor
CoC – Certificate of Compliance
DOESC – DOE Standard Canister
EBR – Experimental Breeder Reactor
FCF – Fuel Conditioning Facility
FSV – Fort Saint Vrain
HFEEF – Hot Fuel Examination Facility
ICP – Idaho Cleanup Project
IEC – Idaho Environmental Coalition LLC
INL – Idaho National Laboratory
INTEC – Idaho Nuclear Technology & Engineering Center
ISFSI – Independent Spent Fuel Storage Installation

MTHM – Metric Tons Heavy Metal
MTR – Materials Test Reactor
NRC – Nuclear Regulatory Commission
NNPP – Naval Nuclear Propulsion Program
NRF – Naval Reactors Facility
NUHOMS – Nuclear Horizontal Modular Storage
RRDP – Road Ready Demonstration Project
RSWF – Radioactive Scrap and Waste Facility
SNF – Spent Nuclear Fuel
TMI – Three Mile Island

DOESC Closure Technology

DOESC Weld & Inspection Machines



Welding Platform

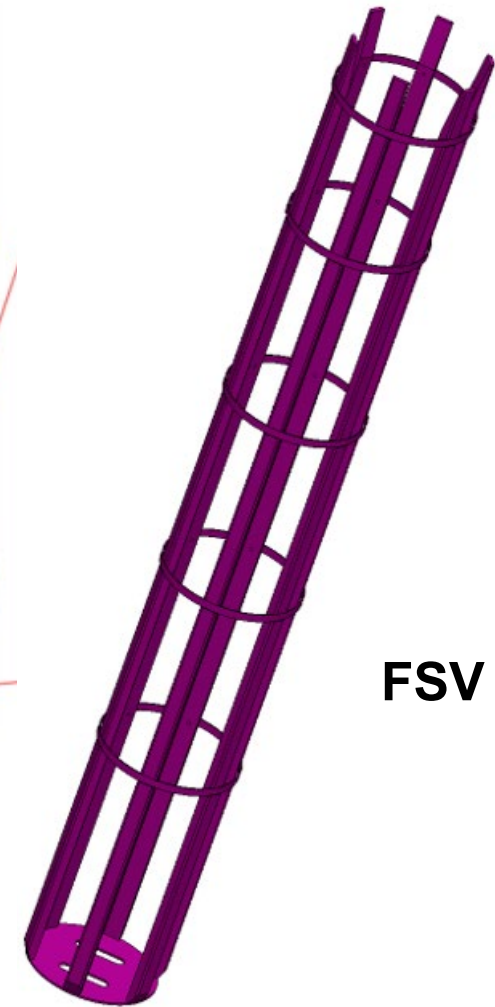
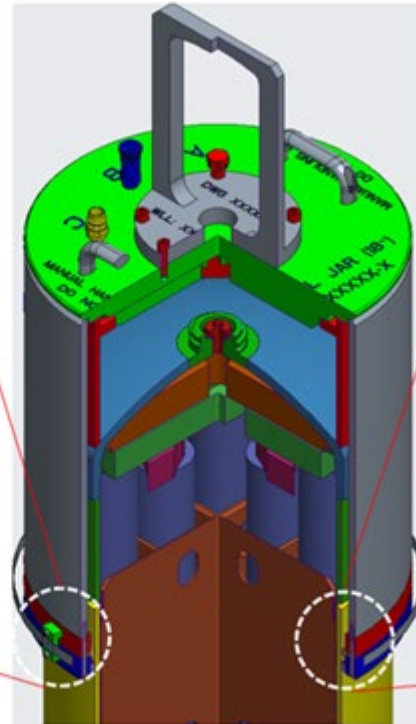
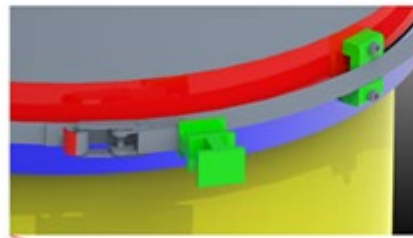
Repair Platform



DOESC Closure Technology Continued...

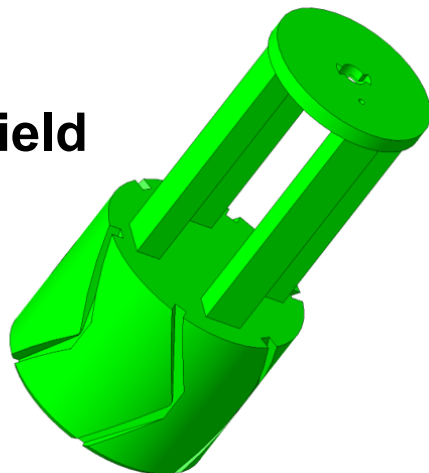


DOESC Leak Test Assembly

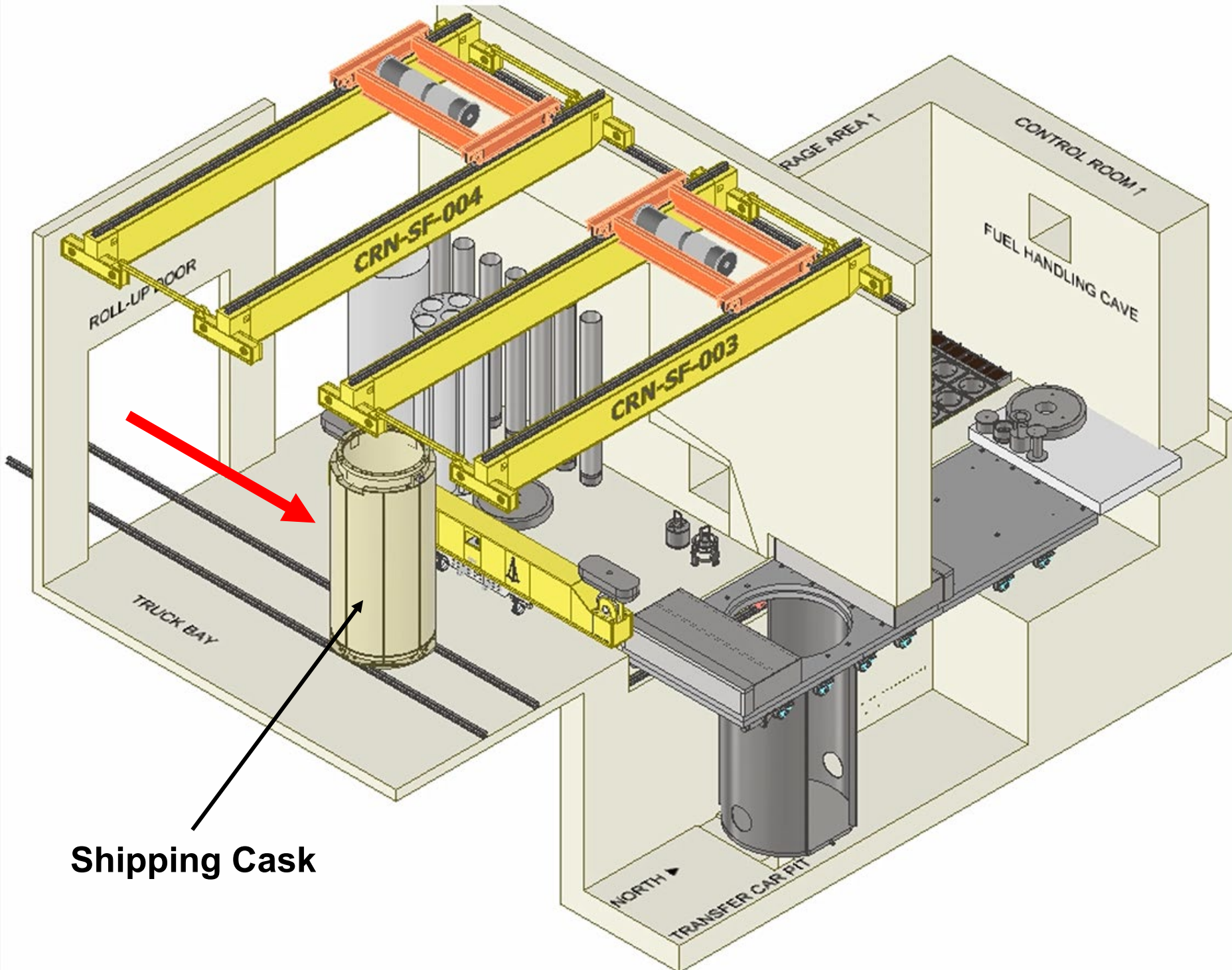


FSV Basket

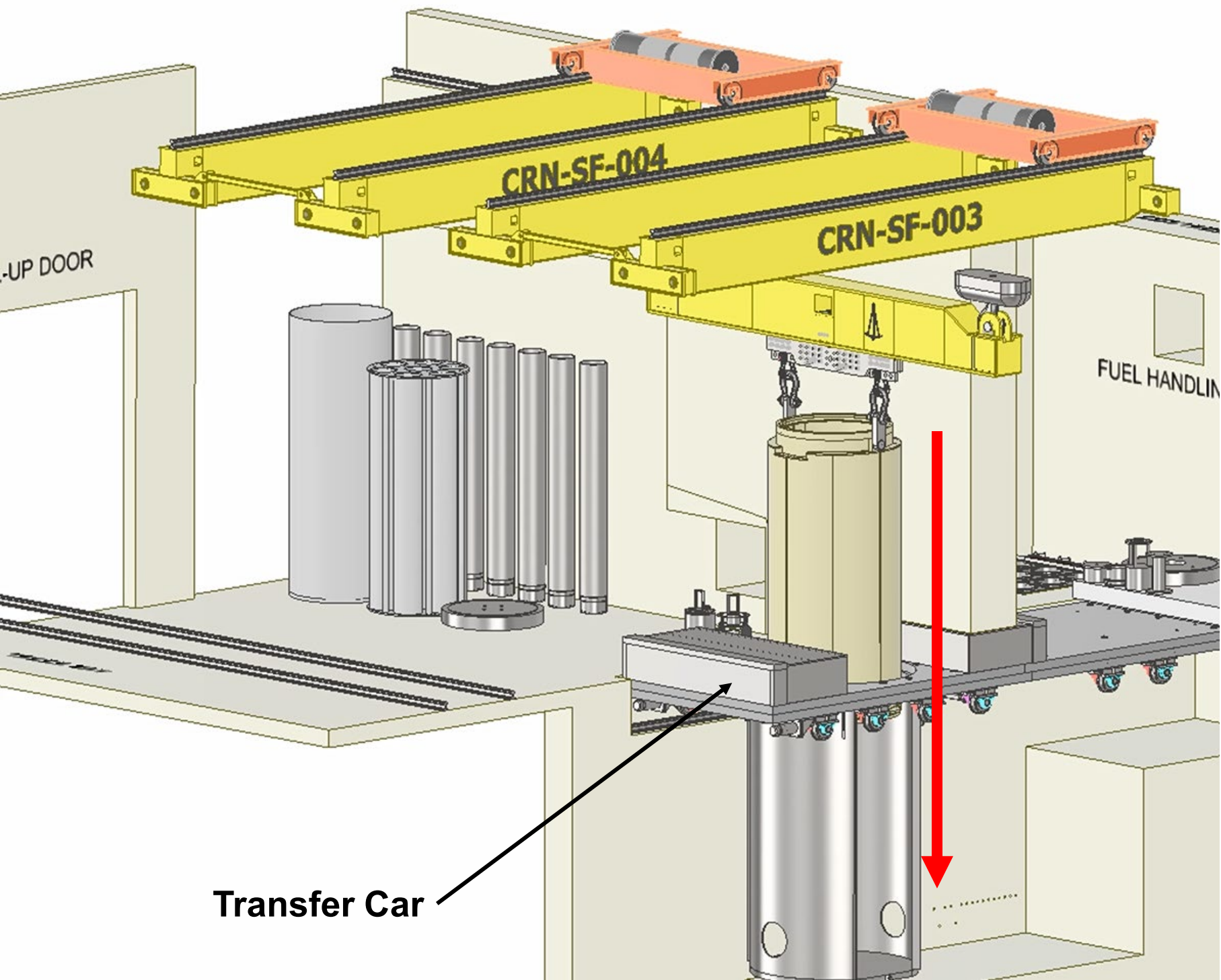
DOESC Shield Plug



A shipping cask is brought into the IFSF truck bay on a
“Low-Profile Transporter”

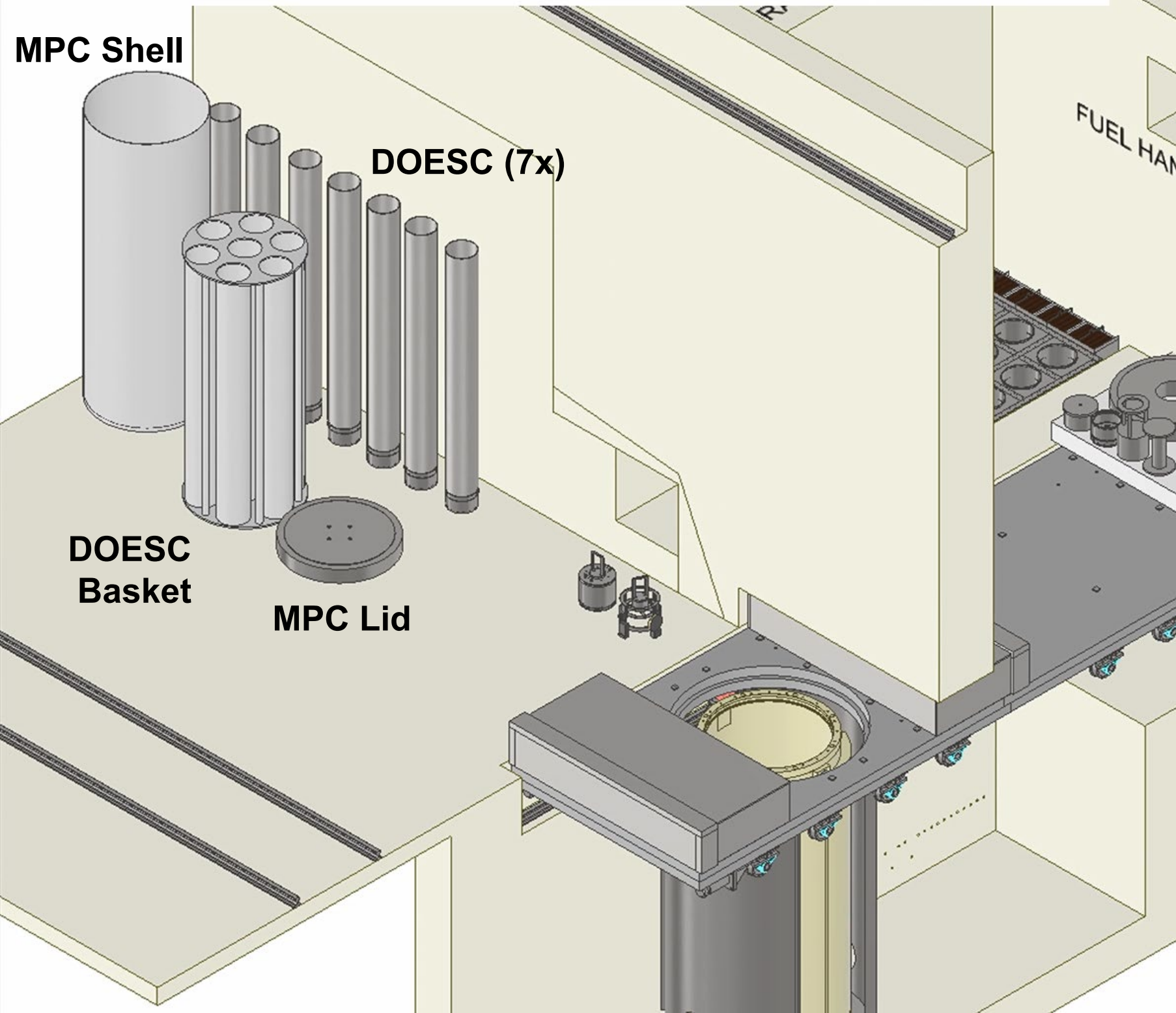


The shipping cask is installed into the Transfer Car

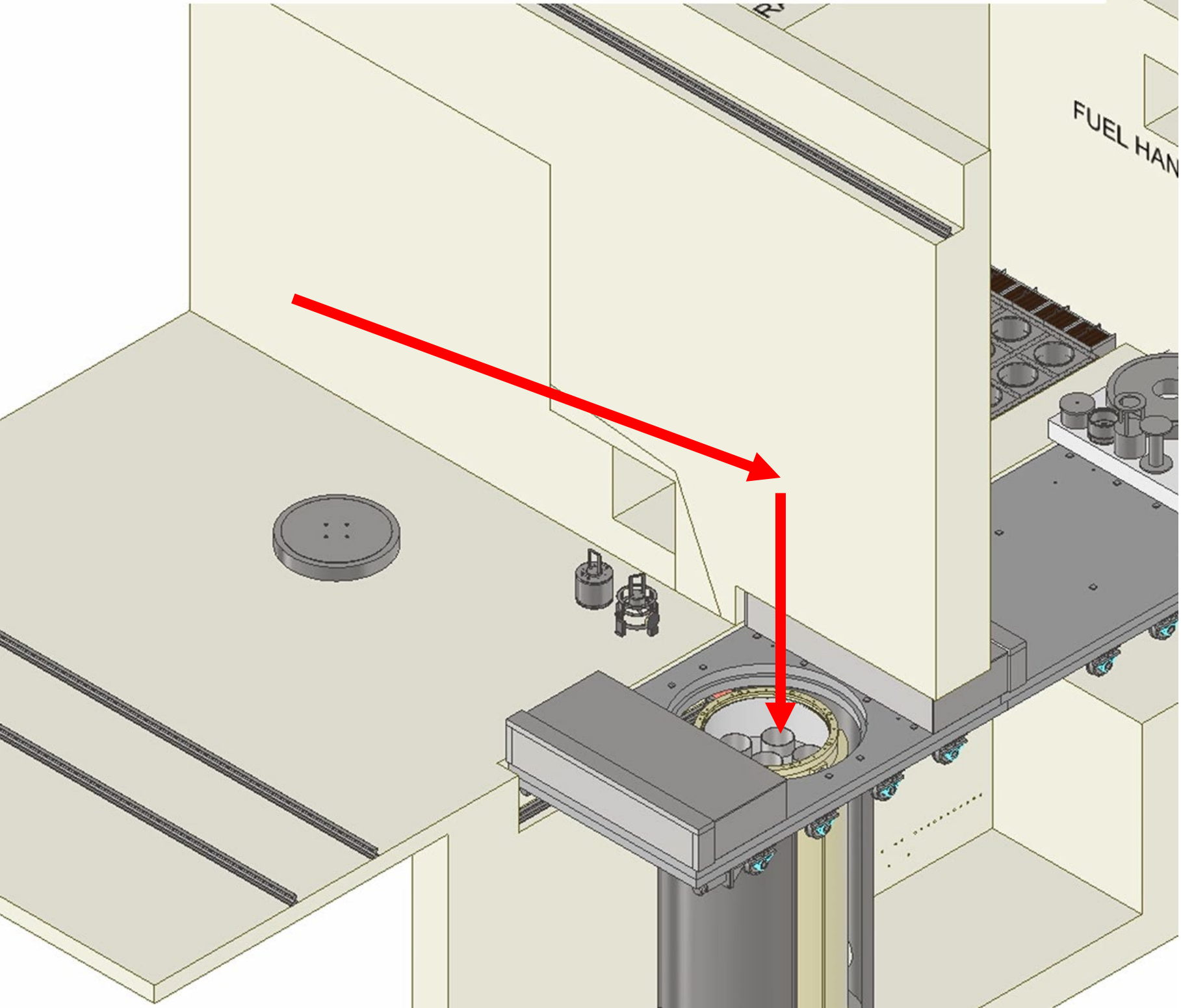


Transfer Car

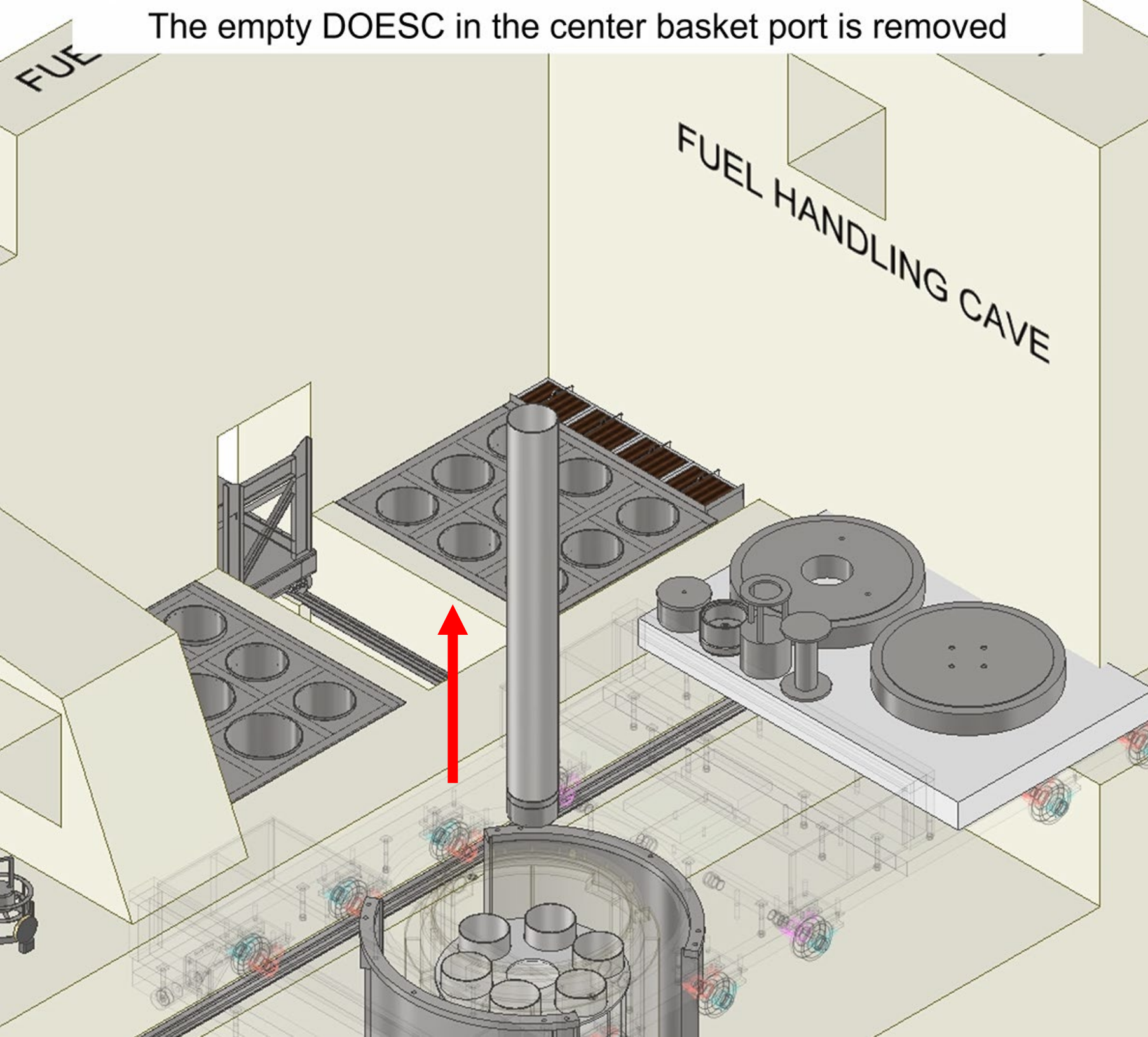
An empty MPC shell is installed into the shipping cask



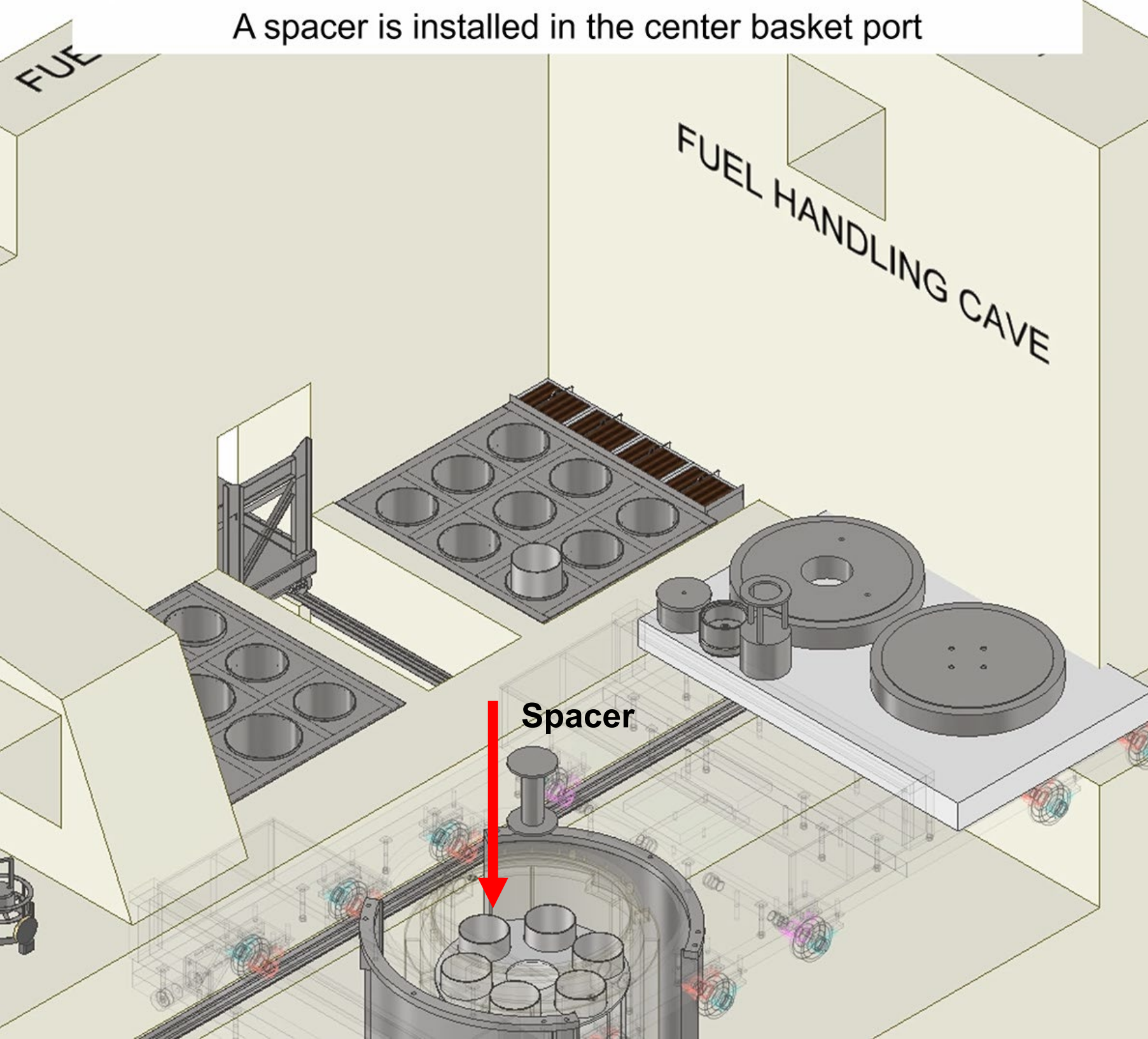
Seven DOESC's are loaded into the DOESC basket



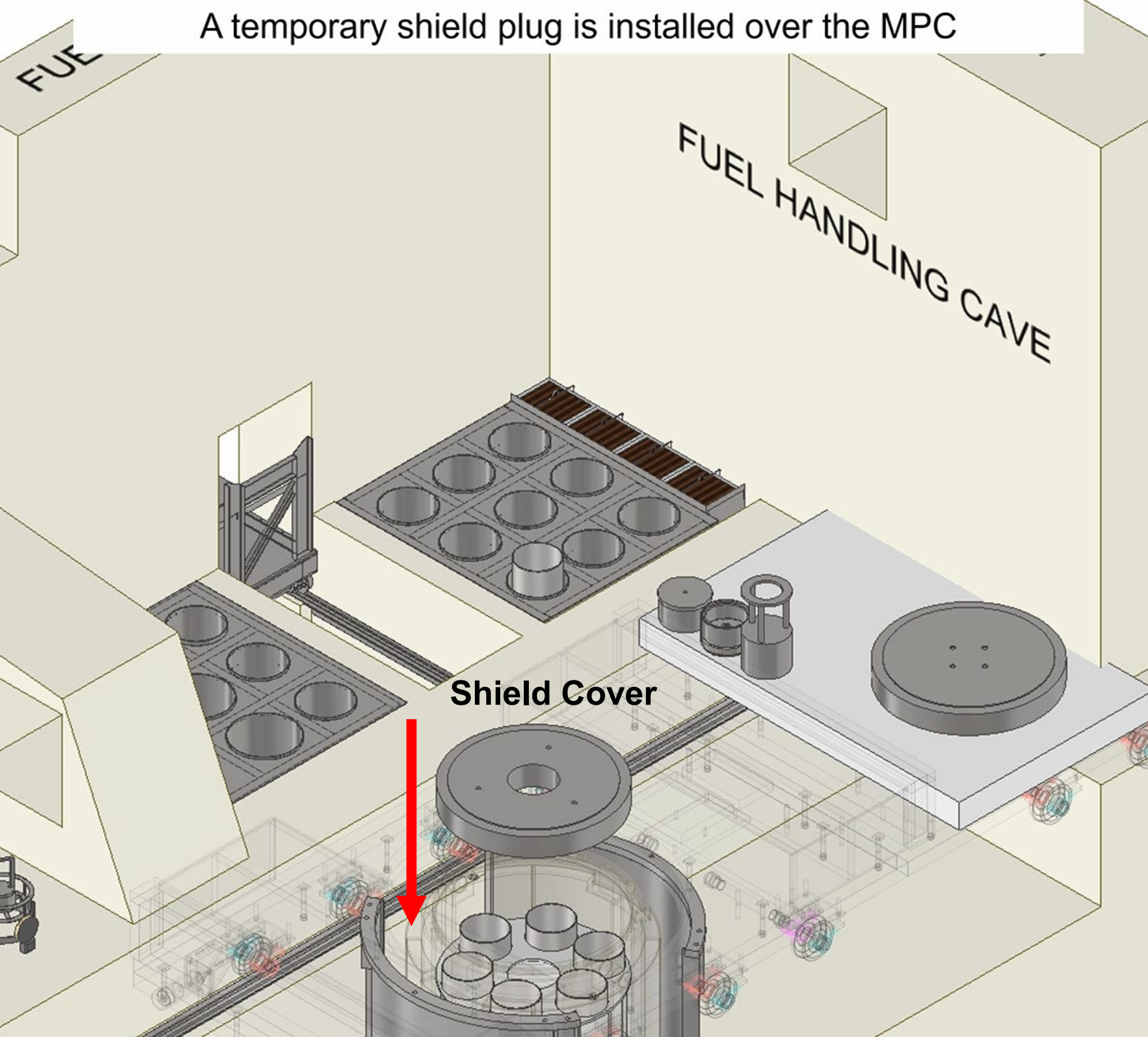
The empty DOESC in the center basket port is removed



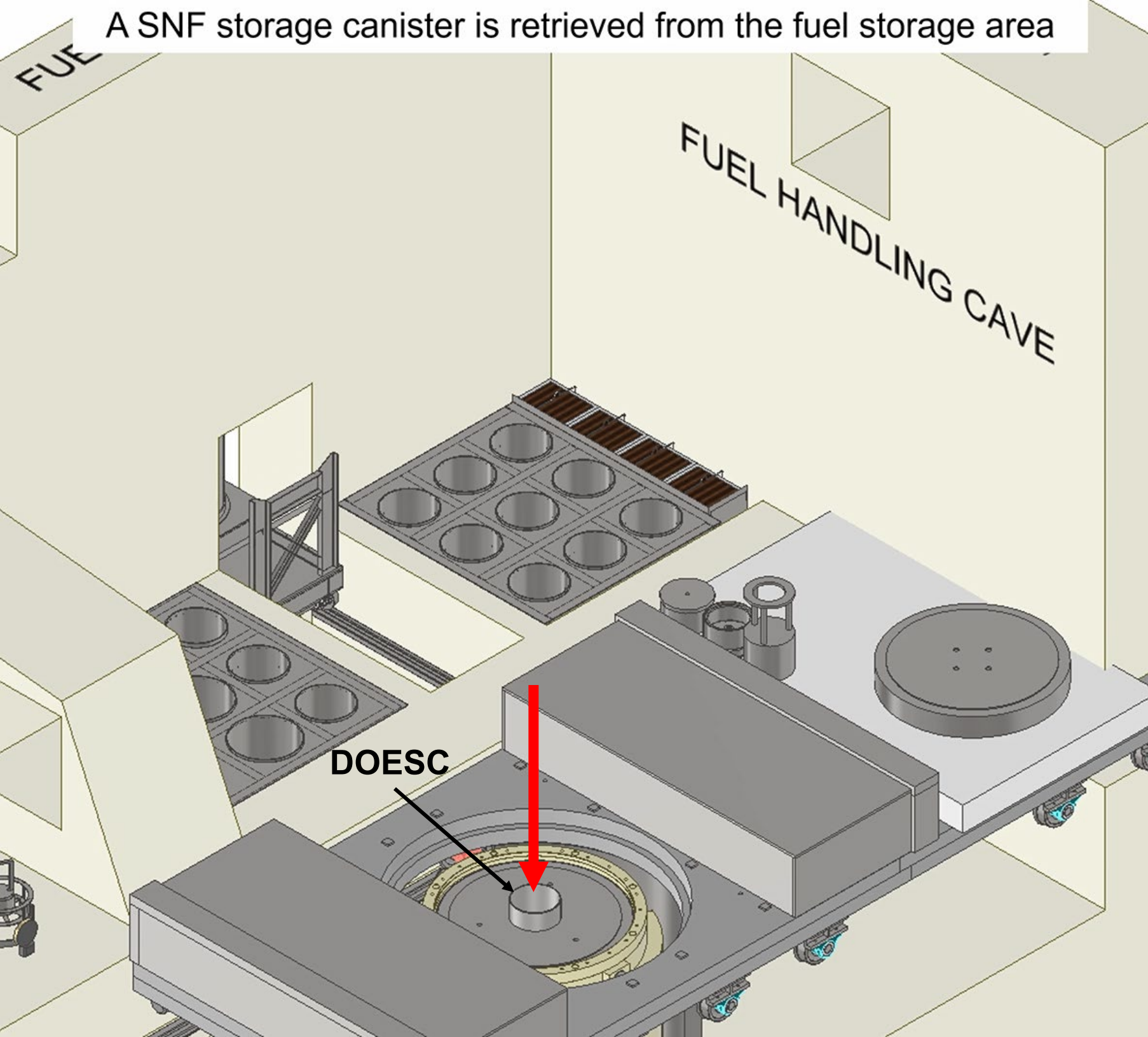
A spacer is installed in the center basket port



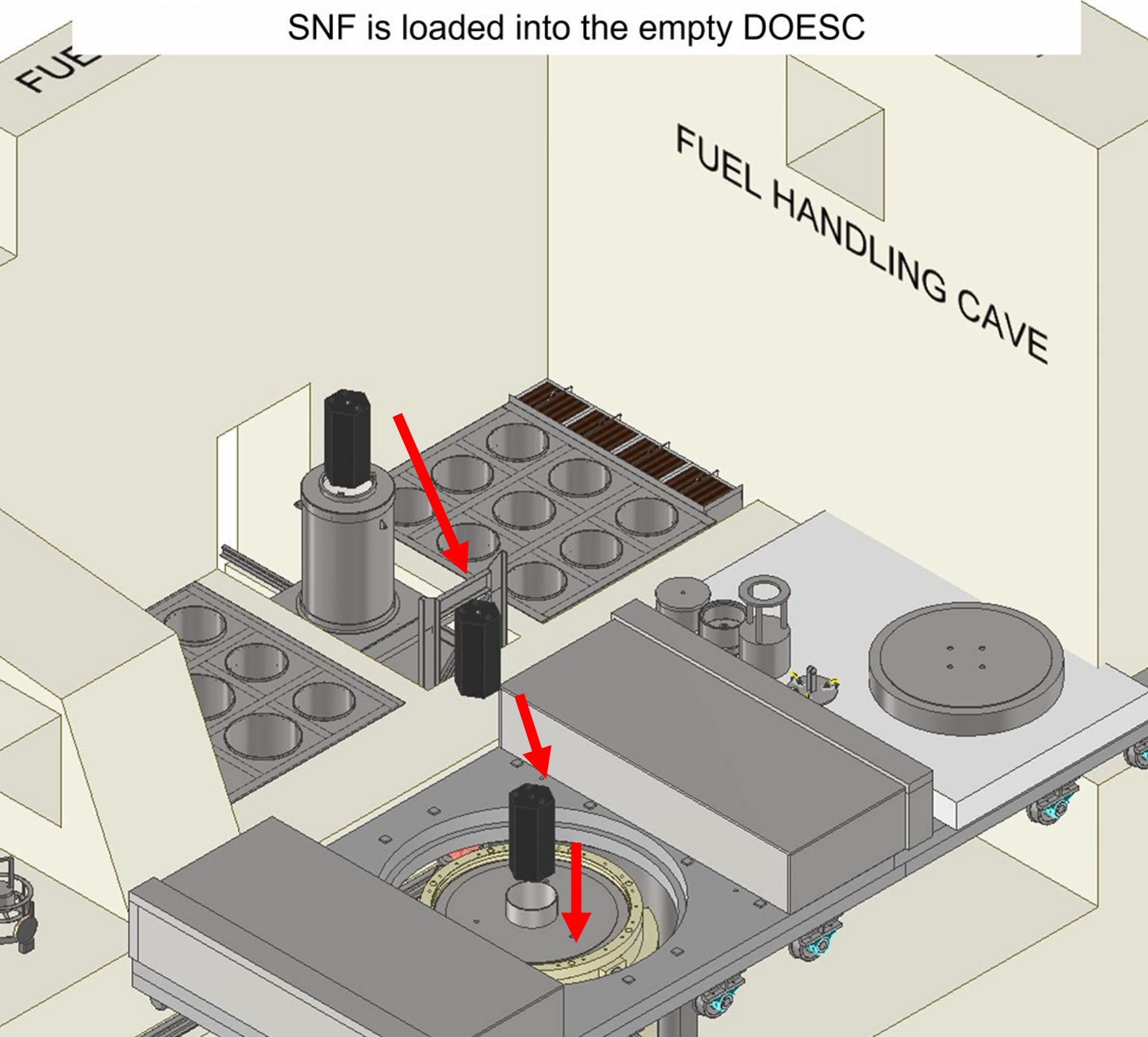
A temporary shield plug is installed over the MPC



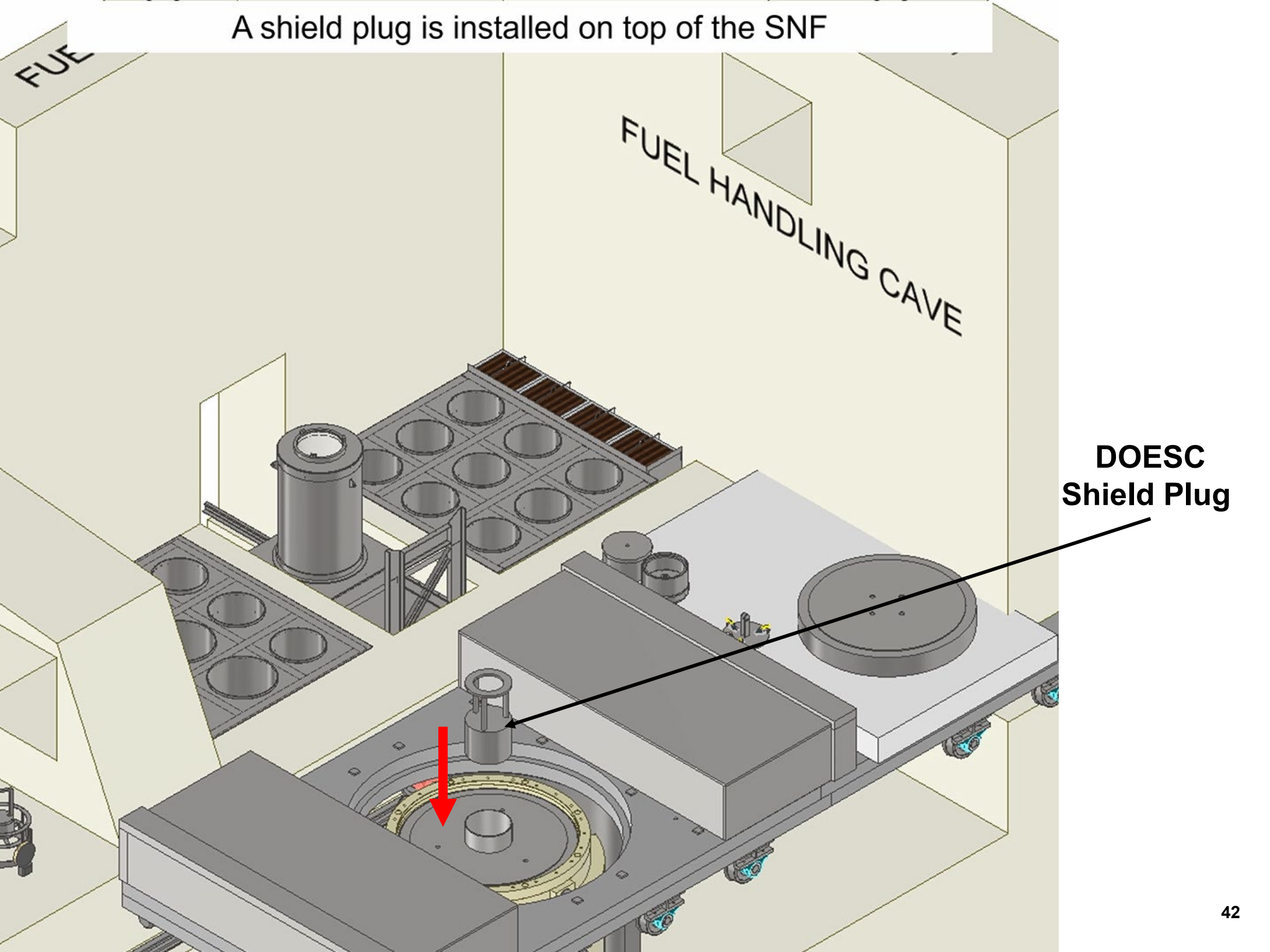
A SNF storage canister is retrieved from the fuel storage area



SNF is loaded into the empty DOESC

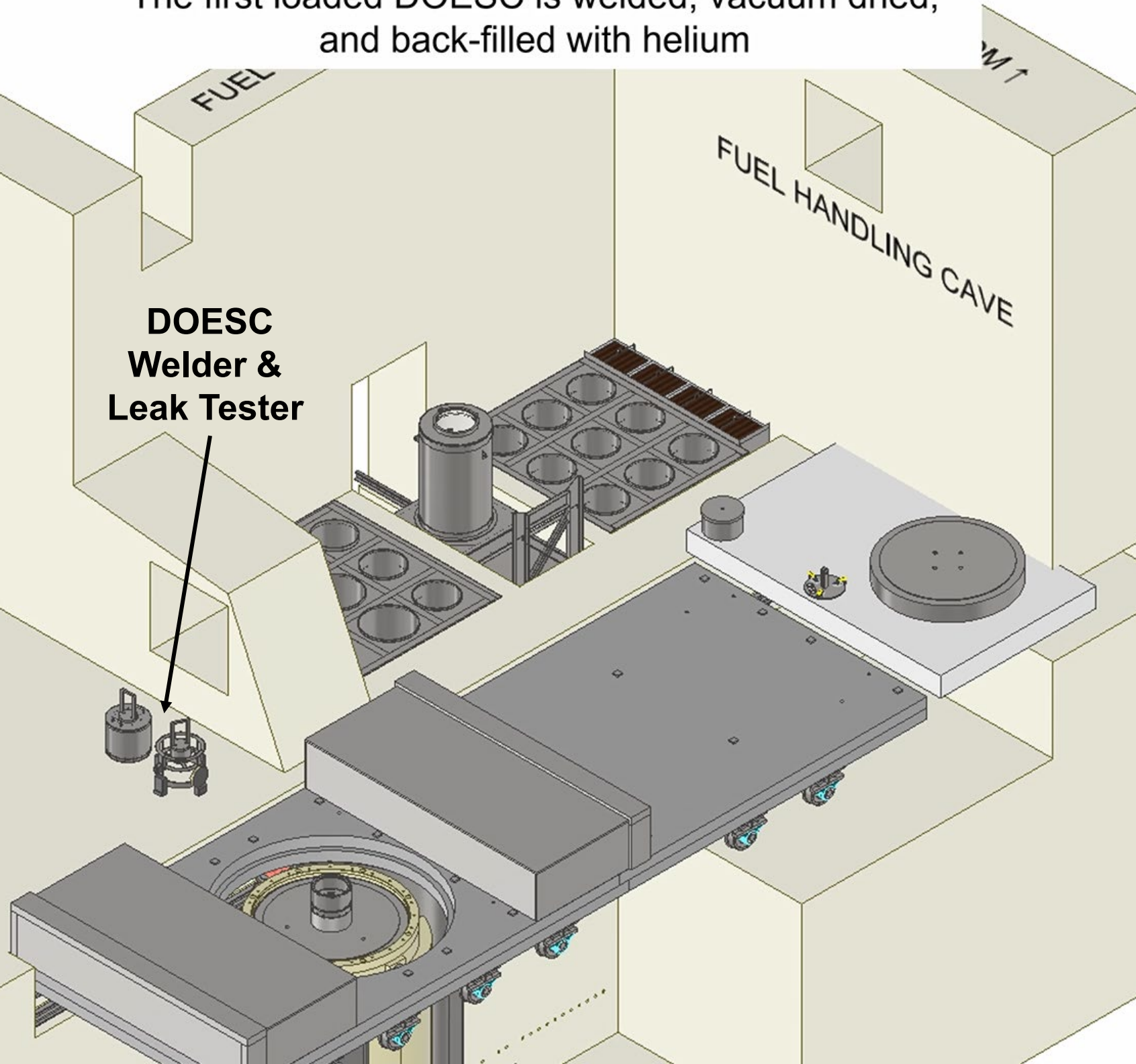


A shield plug is installed on top of the SNF

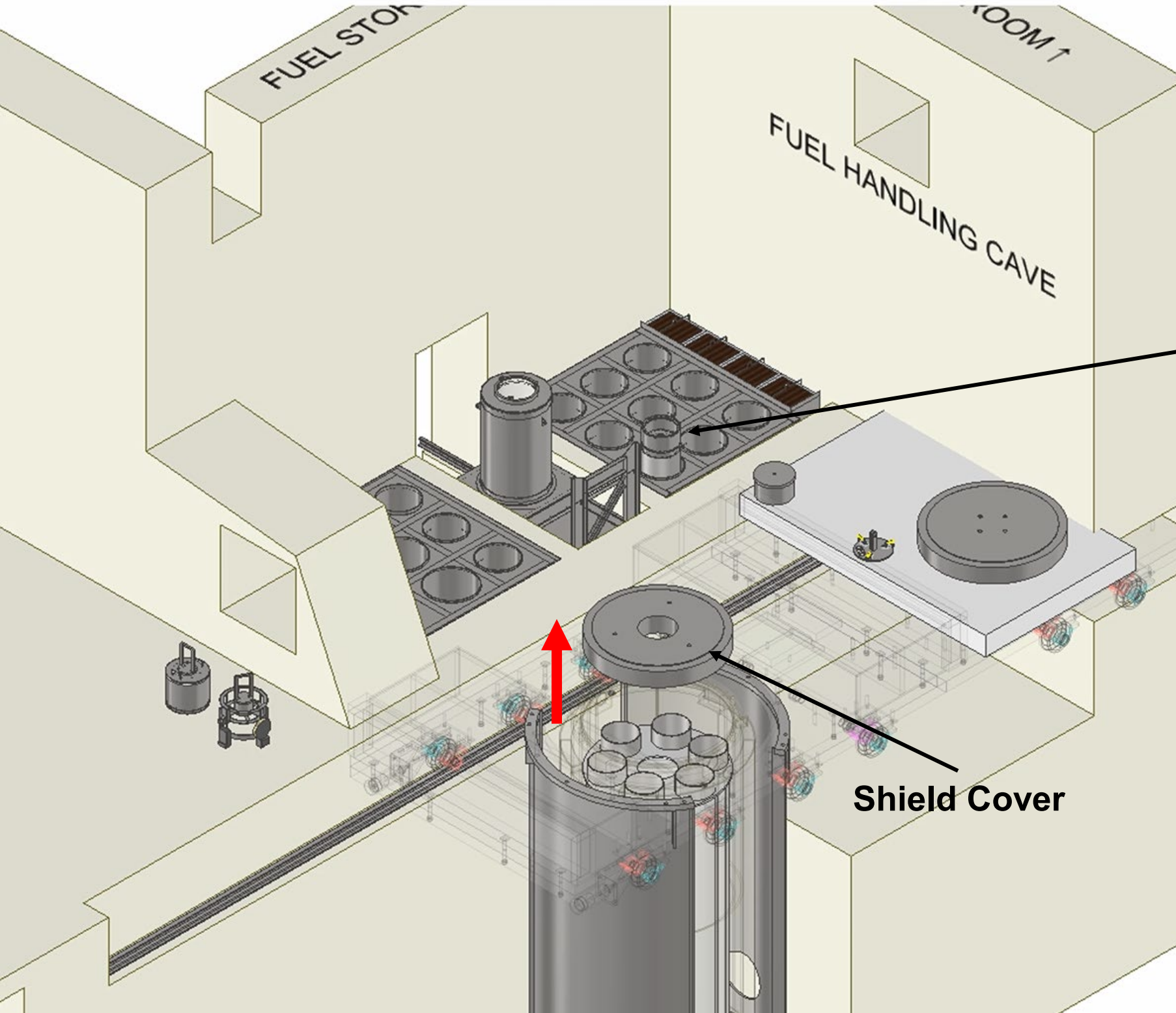


**DOESC
Shield Plug**

The first loaded DOESC is welded, vacuum dried,
and back-filled with helium



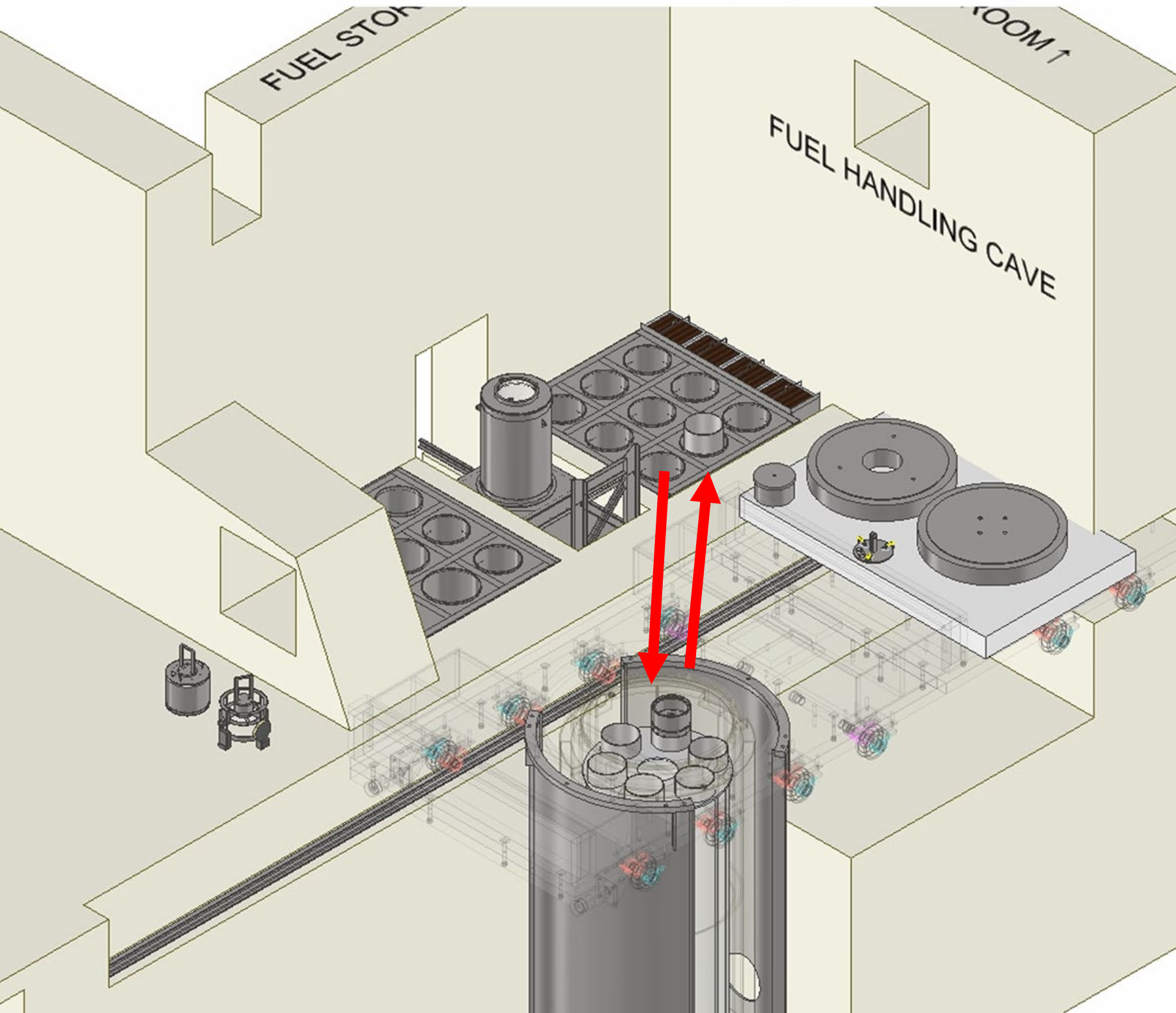
The temporary shield plug is removed and staged



**1st Loaded
DOESC**

Shield Cover

The first loaded DOESC is moved to a peripheral basket port



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- DOE Standard Canister Specifications
 - INL's Code of Record (COR-0009)
 - 2015 ASME BPVC Section III Division 3, WA (general), WB (transportation), WC (storage), & WD (internals)
 - Volumetric UT examination of closure welds
 - Back-filled & helium leak tested (ANSI N14.5-2022, 1E-07 std-cc/sec)

