



**EUROPEAN
SPALLATION
SOURCE**



European Spallation Source J-PARC visit to ESS 2022

ESS update – ACF (Active Cells Facility) & cutting trials

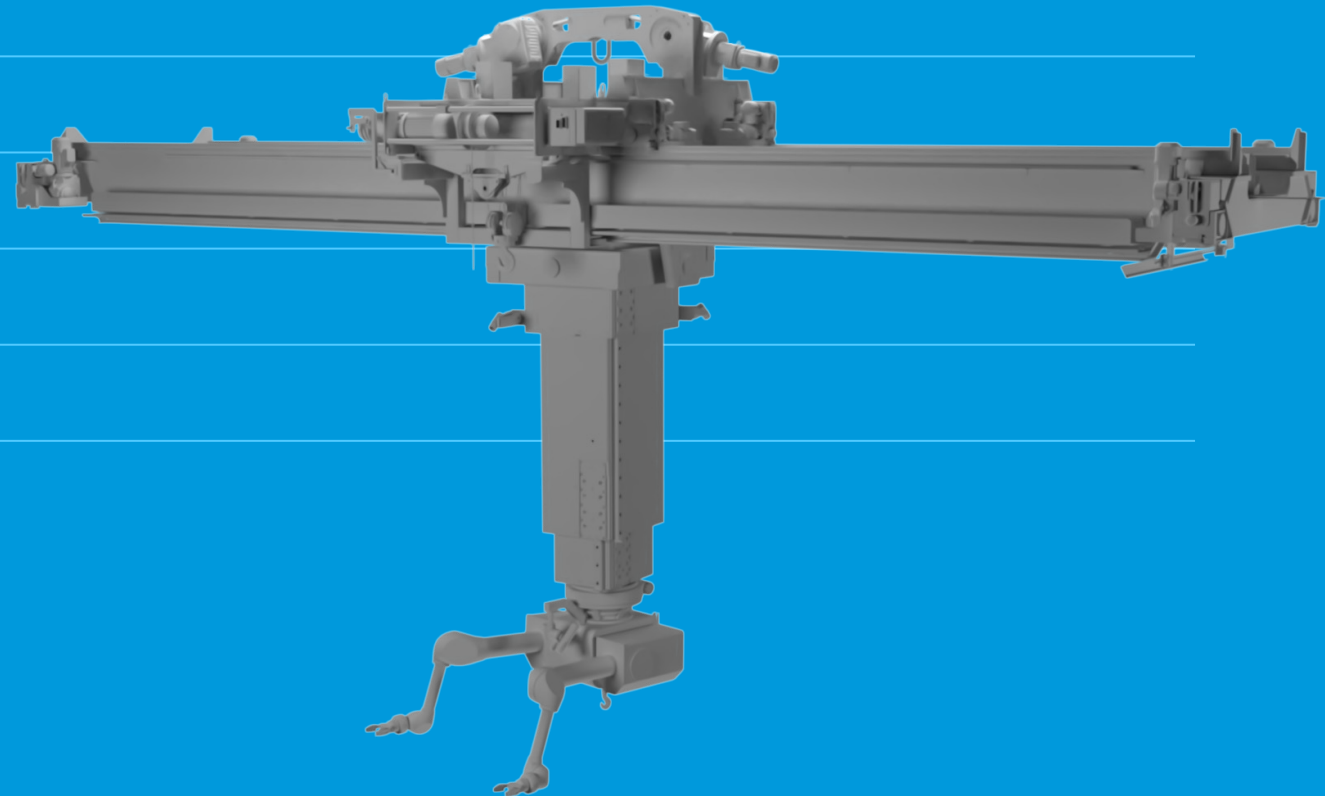
DR CARWYN JONES
WORK PACKAGE MANAGER-REMOTE HANDLING SYSTEMS
EUROPEAN SPALLATION SOURCE ERIC

2022-10-11



Agenda

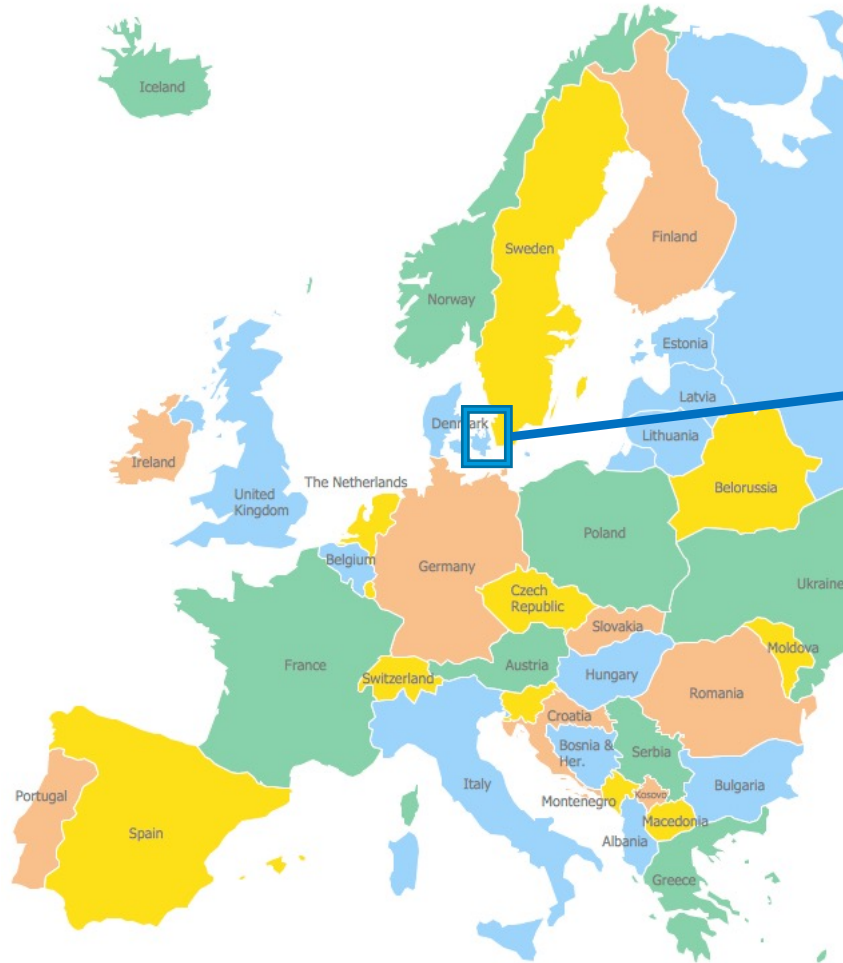
- 1 ESS & Target Overview
- 2 Remote Handling System (RHS) Overview
- 3 Active Cells Facility (ACF) Progress
- 4 Site Progress
- 5 Cutting trials (Harry Robinson)





Where is ESS?

Lund, Sweden





ESS



FEBRUARY 2022



ESS



SEPTEMBER 2014

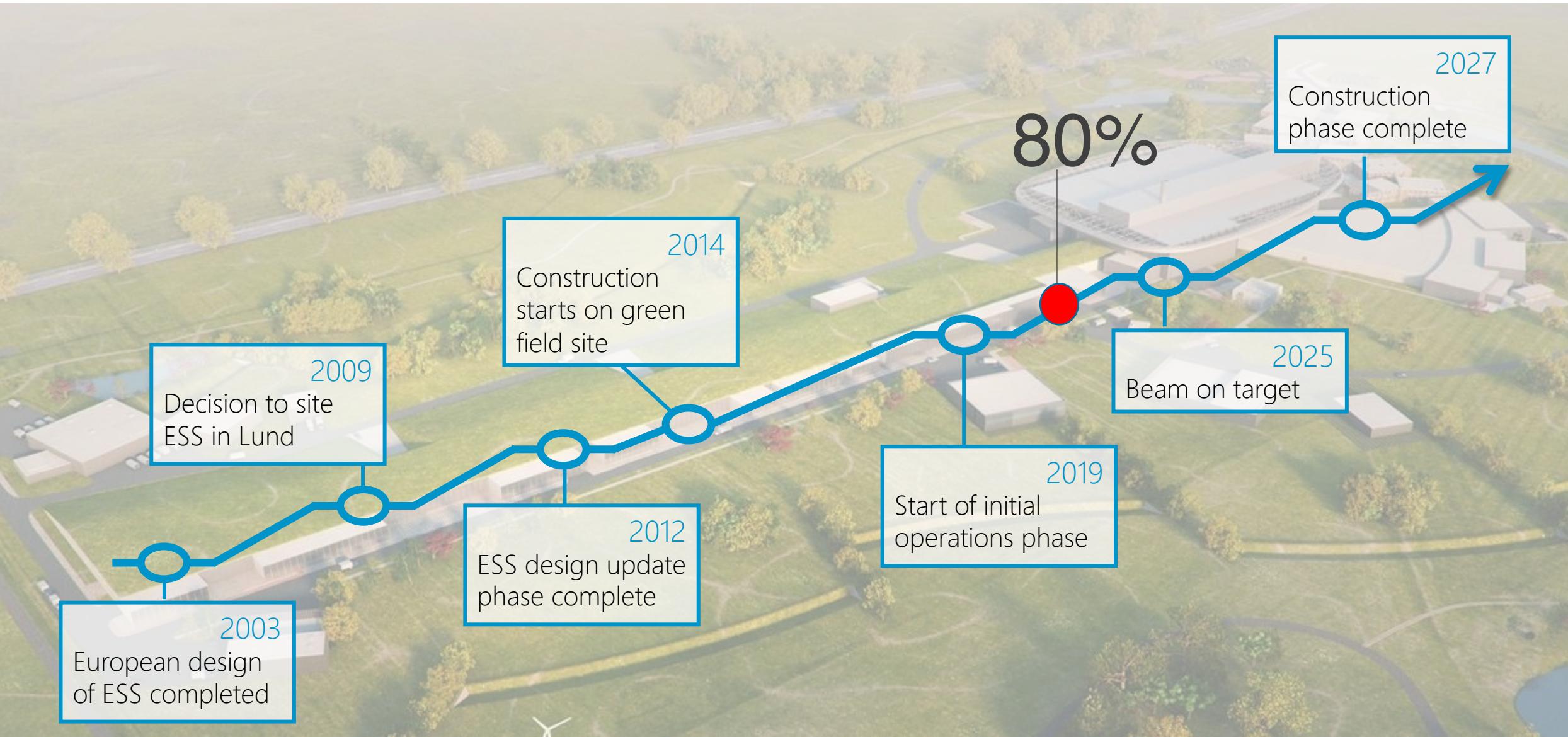


ESS



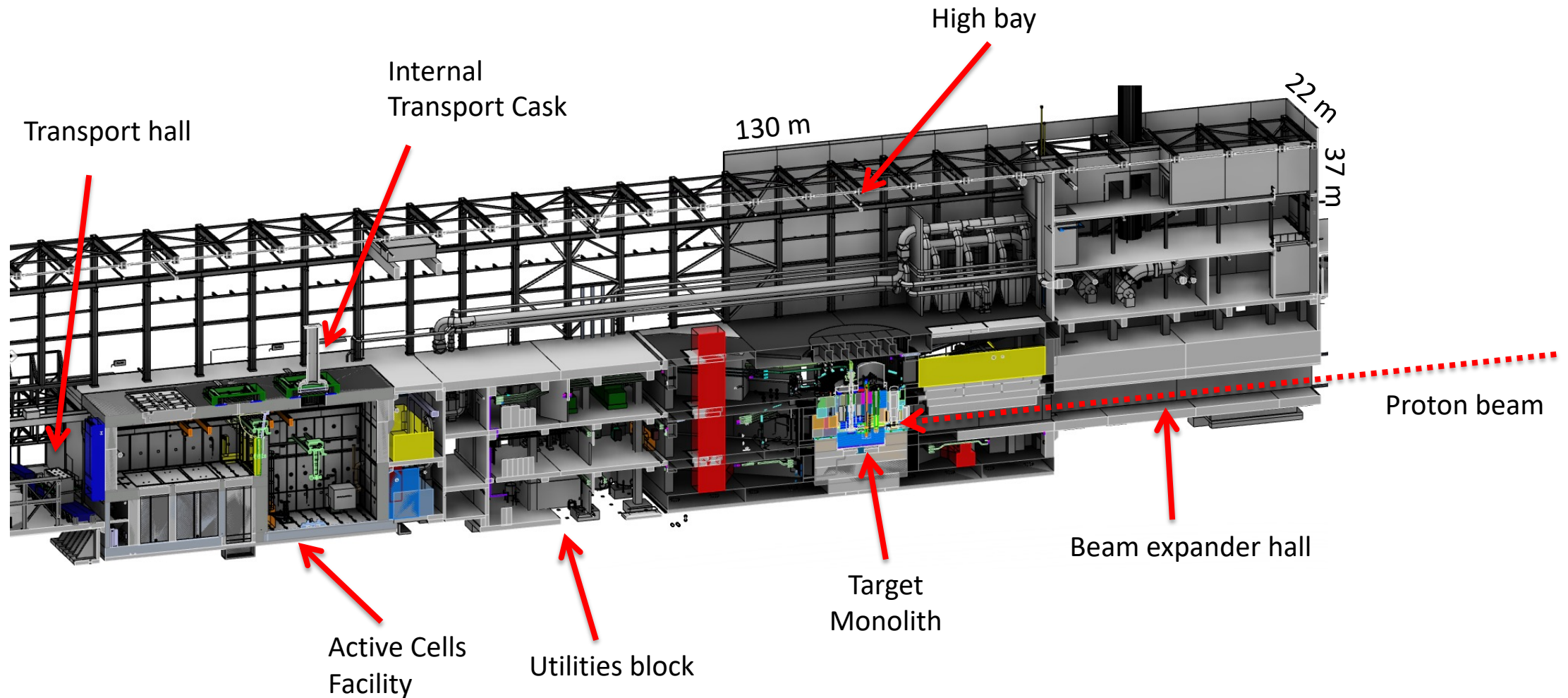
SEPTEMBER 2019 (LAST
HOTLAB)

The ESS journey

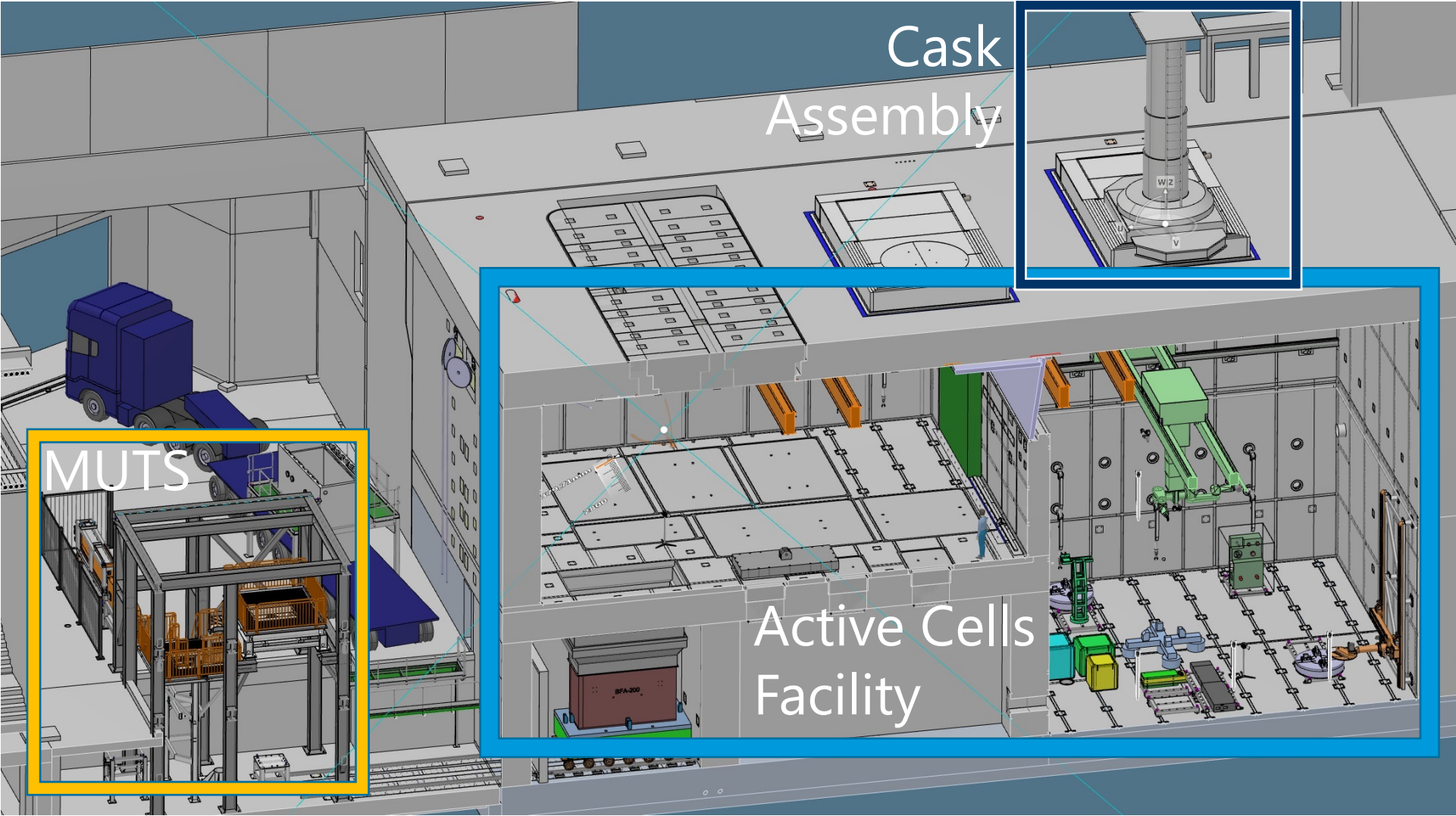


Target Station

Cut section of the D02 building



Remote Handling Systems



Cask Assembly

Seven casks and three monolith gamma gates

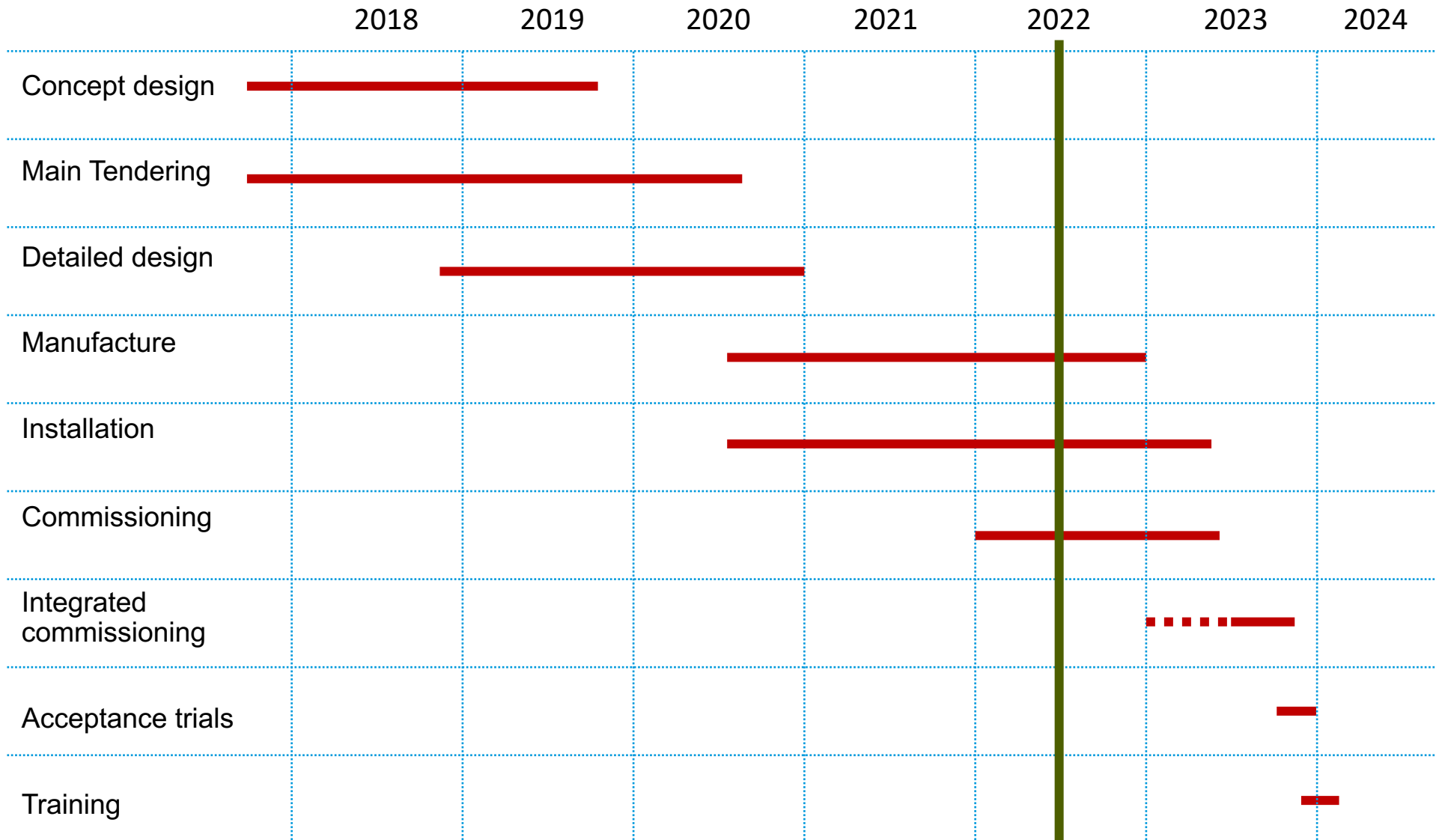
Hungarian Centre of Energy Research (CER) In-Kind group
Build and installation.

- Design: Complete
- FAT: Q2 2023 – Q4 2024
- SAT: Q1 2025



Active Cells Facility - High level schedule

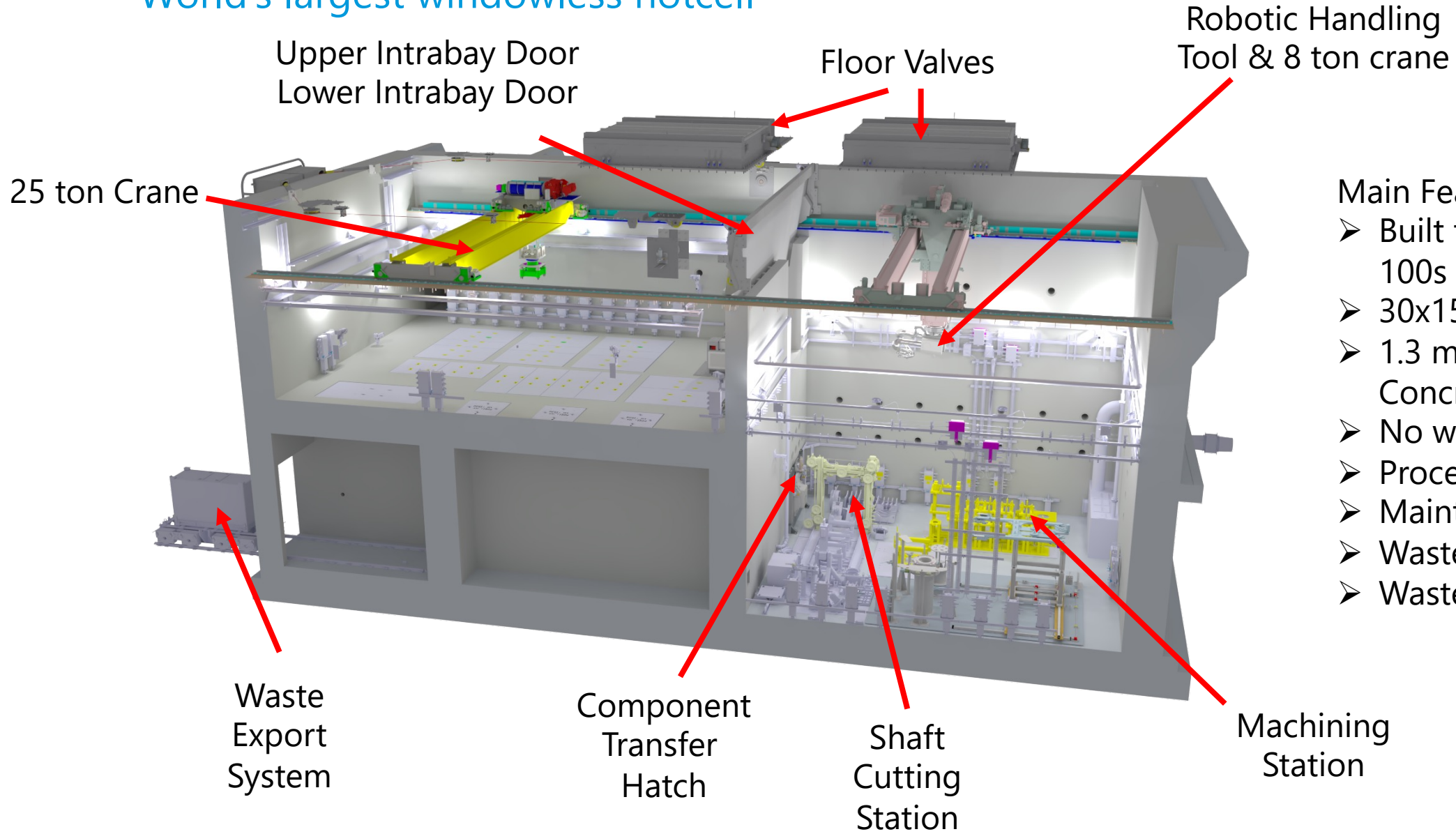
UKAEA / RACE In-kind delivery to ESS



- Majority of the Manufacture is completed
- Installations progressing
- Entering into commissioning phase

The Active Cells Facility (ACF)

World's largest windowless hotcell



Main Features:

- Built to handle waste in 100s Sv/h range
- 30x15x12 m (LxHxW)
- 1.3 m High Density Concrete
- No windows
- Process Cell
- Maintenance Cell
- Waste storage
- Waste shipment

ACF

Images from 2019 (year of last Hotlab)



ACF 2022



Waste Transfer System

Current Status

Contract: Aquila
Design, build and **install**

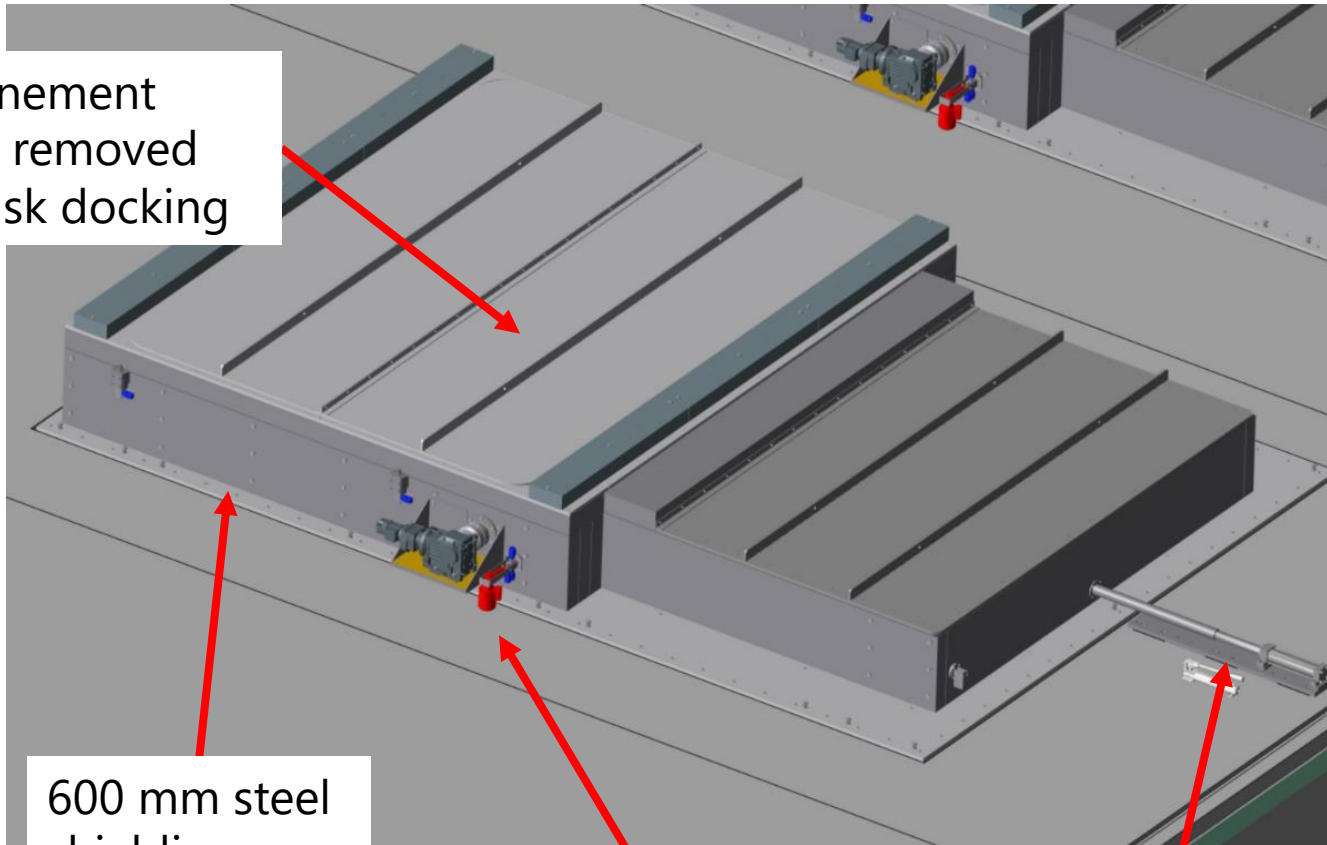
➤ SAT: Q1 2022



Floor Valves

Current Status

Confinement plate, removed for cask docking



600 mm steel shielding

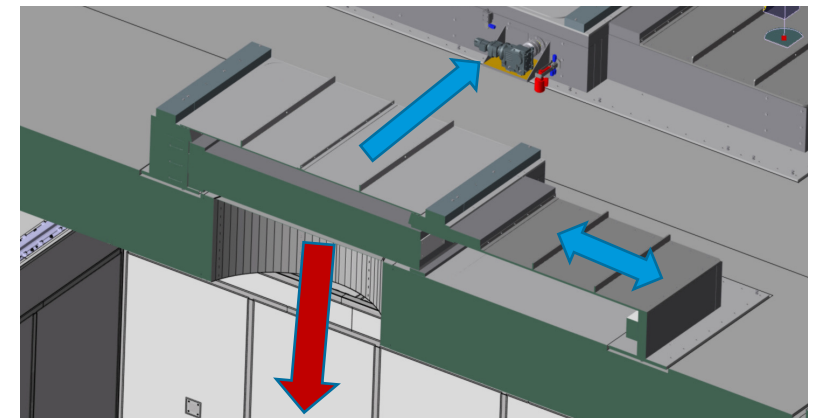
Electric Motor drives shield door

Hand Pump to close door for recovery



Contract: Ansaldo (Asturfeito)
Design build & install
(Complete)

➤ SAT: Q1 2022



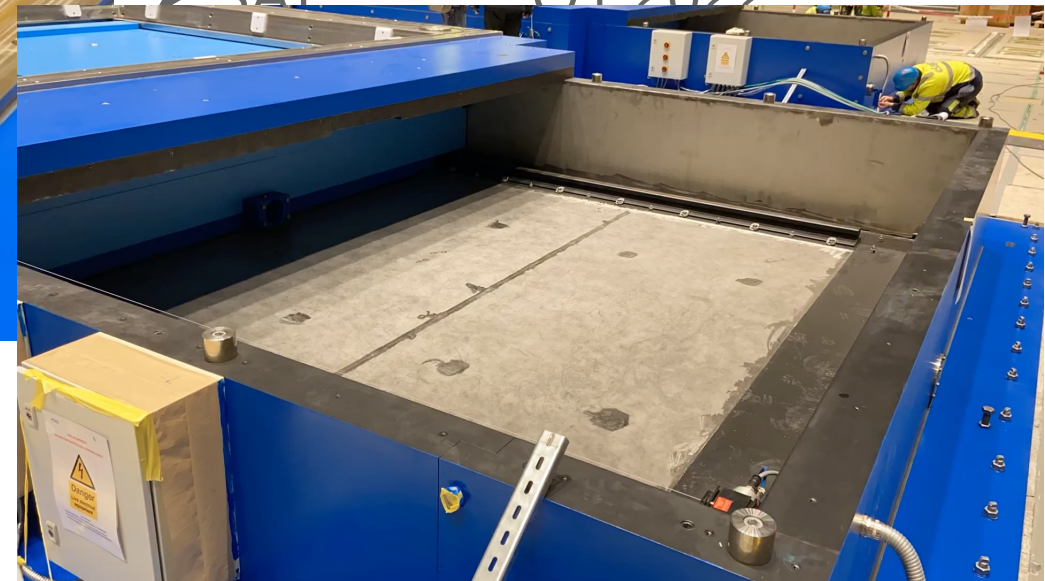
Floor Valves

Current Status



Contract: Ansaldo (Asturfeito)
Design build & install
(Complete)

➤ SAT: 01 2022





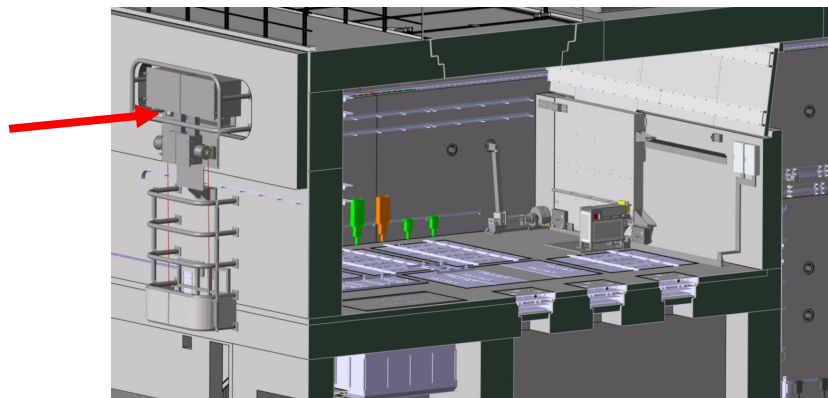
Intrabay doors (Upper and Lower)

Current Status

Contract: Ansaldo
(Asturfeito)
Design build &
install (**Complete**)

➤ SAT: Q1
2022

Upper Door
driven from
outside the
cell

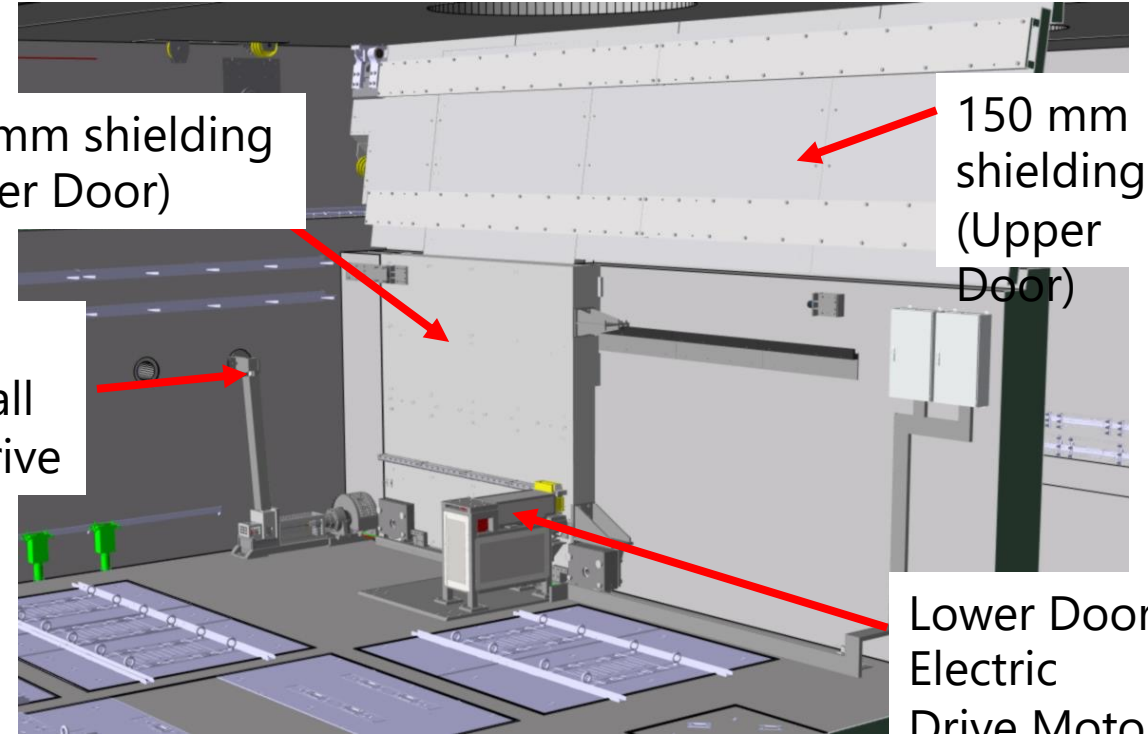


750 mm shielding
(Lower Door)

150 mm
shielding
(Upper
Door)

Manual
through-wall
recovery drive

Lower Door
Electric
Drive Motor



Intrabay doors (Upper and Lower)

Current Status

Contract: Ansaldo
(Asturfeito)
Design build & install
(Complete)

➤ SAT: Q1
2022

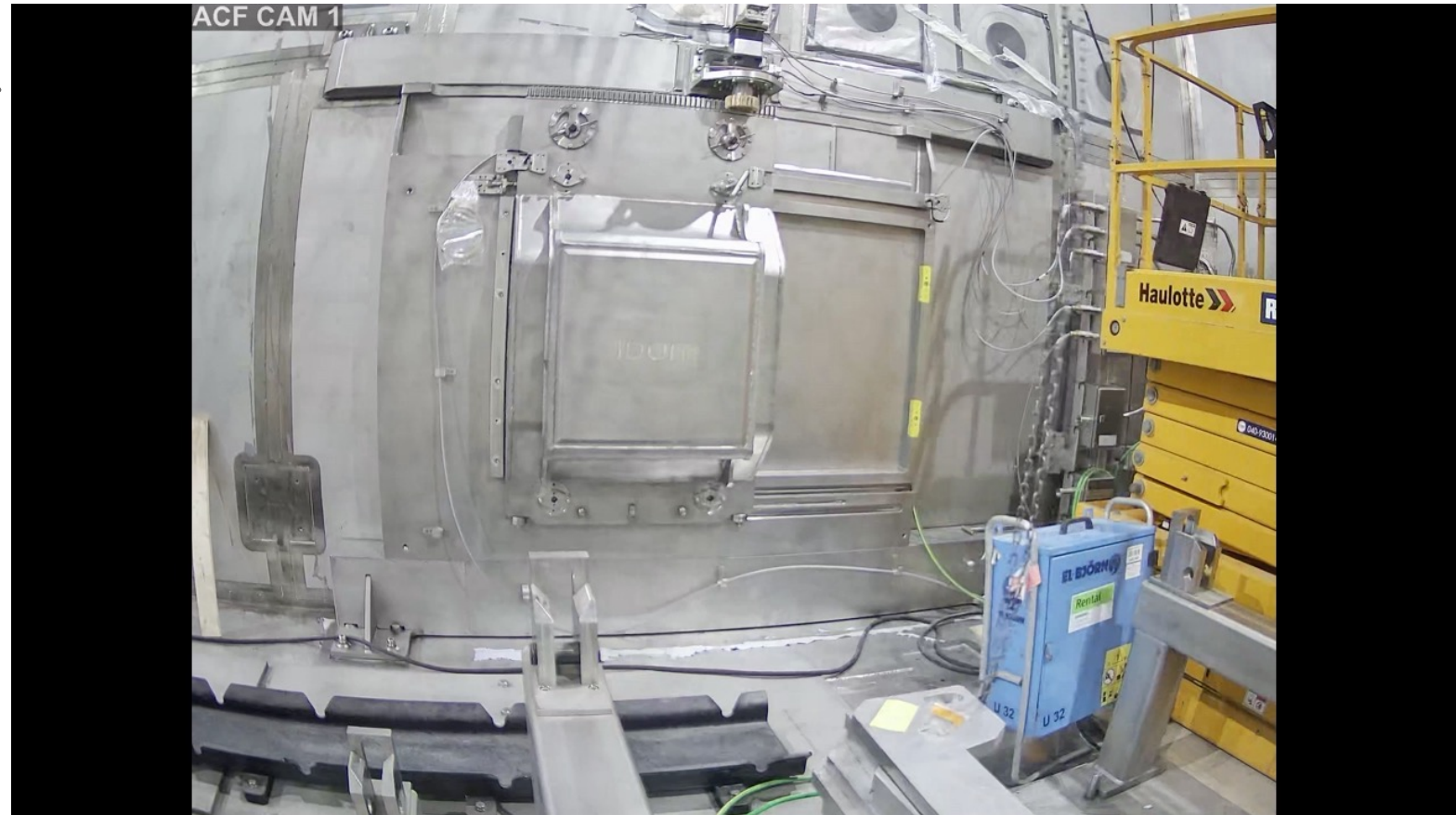
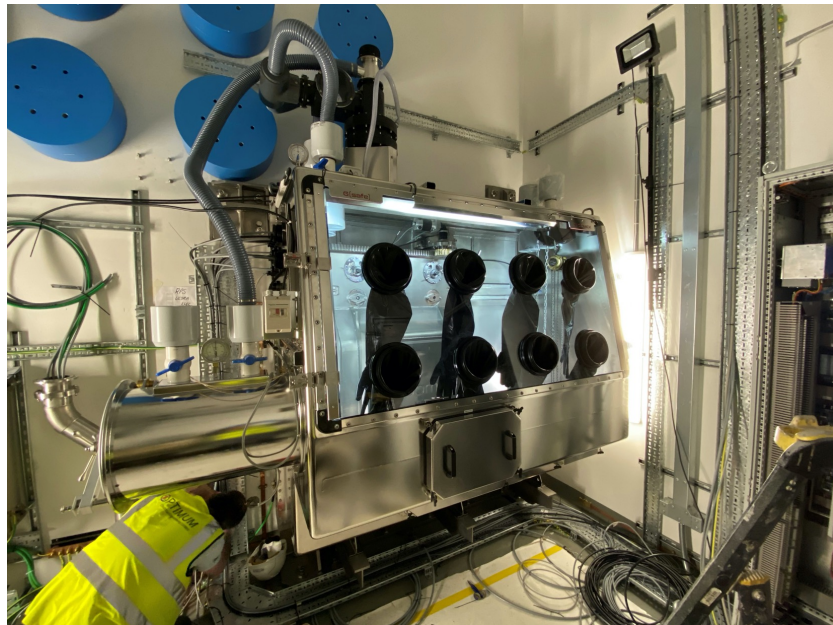


Component Transfer Hatch

Current Status

Contract: IDOM (Jacomex)
Design, **build** and install (Complete).

➤ SAT: Q2 2022



Storage Pit lids

Current Status

Contractr: The Abbey Group
(Amber Precast)

Design, build and **install**

➤ FAT: Q2 2022

➤ SAT: Q3 2022



Grapple Crane (25T)

Current Status

Contract: James Fisher
Nuclear (SCX)

Design, build and
install

➤ FAT: Q2 2022

➤ SAT: Q3 2022



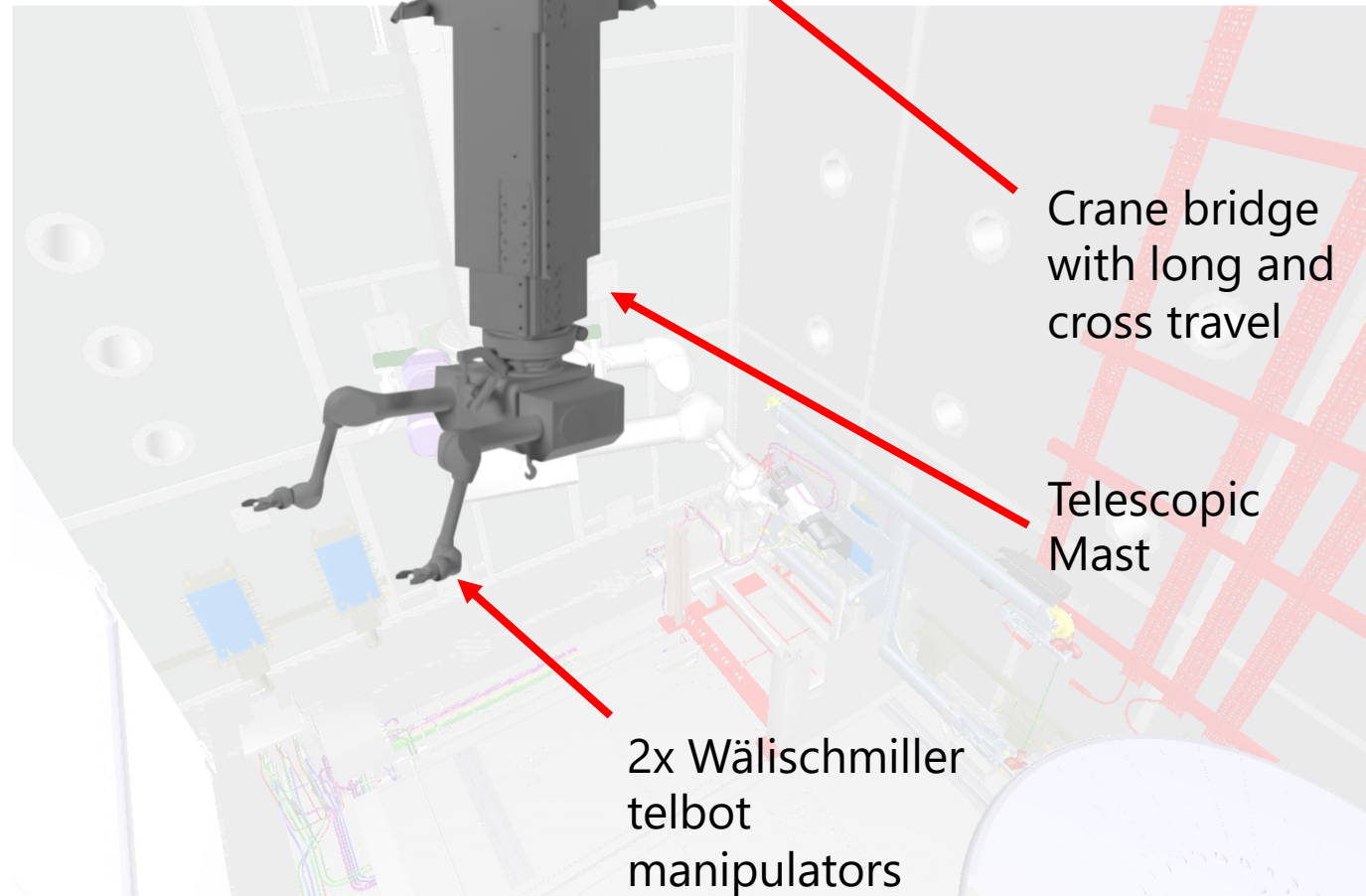
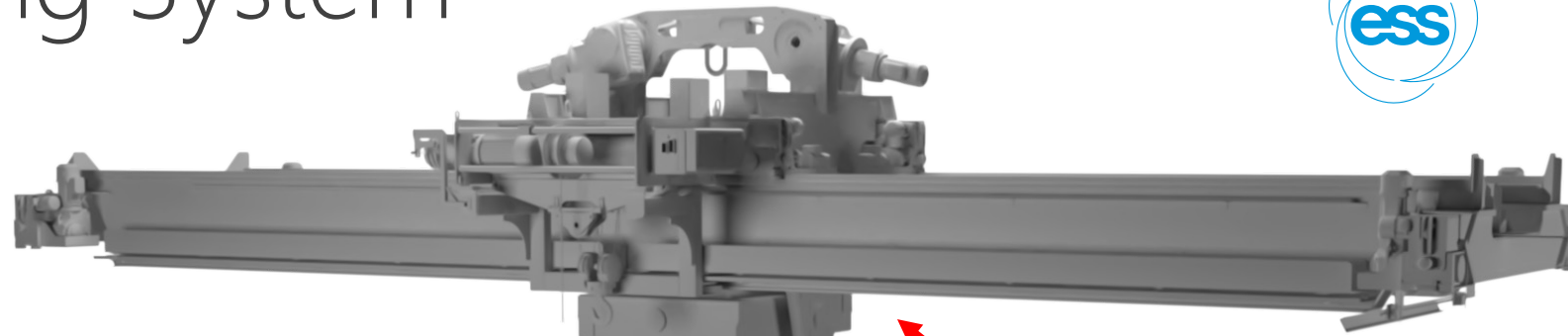
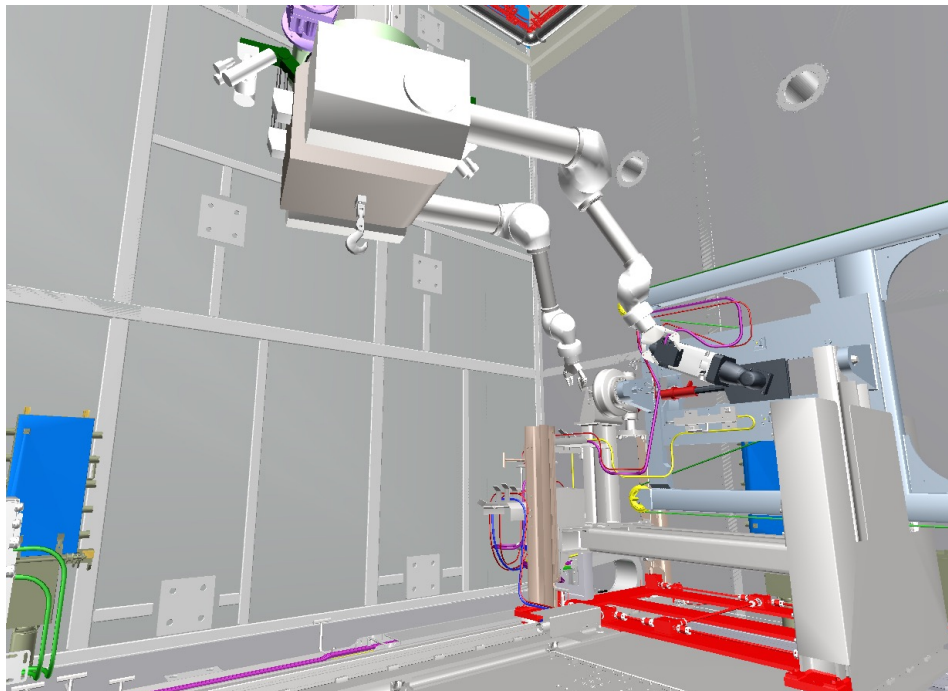


Robotic Handling System

Current Status

Contract: James Fisher Nuclear Design, **build** and installation.

- Design: Q2 2022
- FAT(arms/RHS): Q2 2022 / Q1 2023
- SAT: Q2 2023

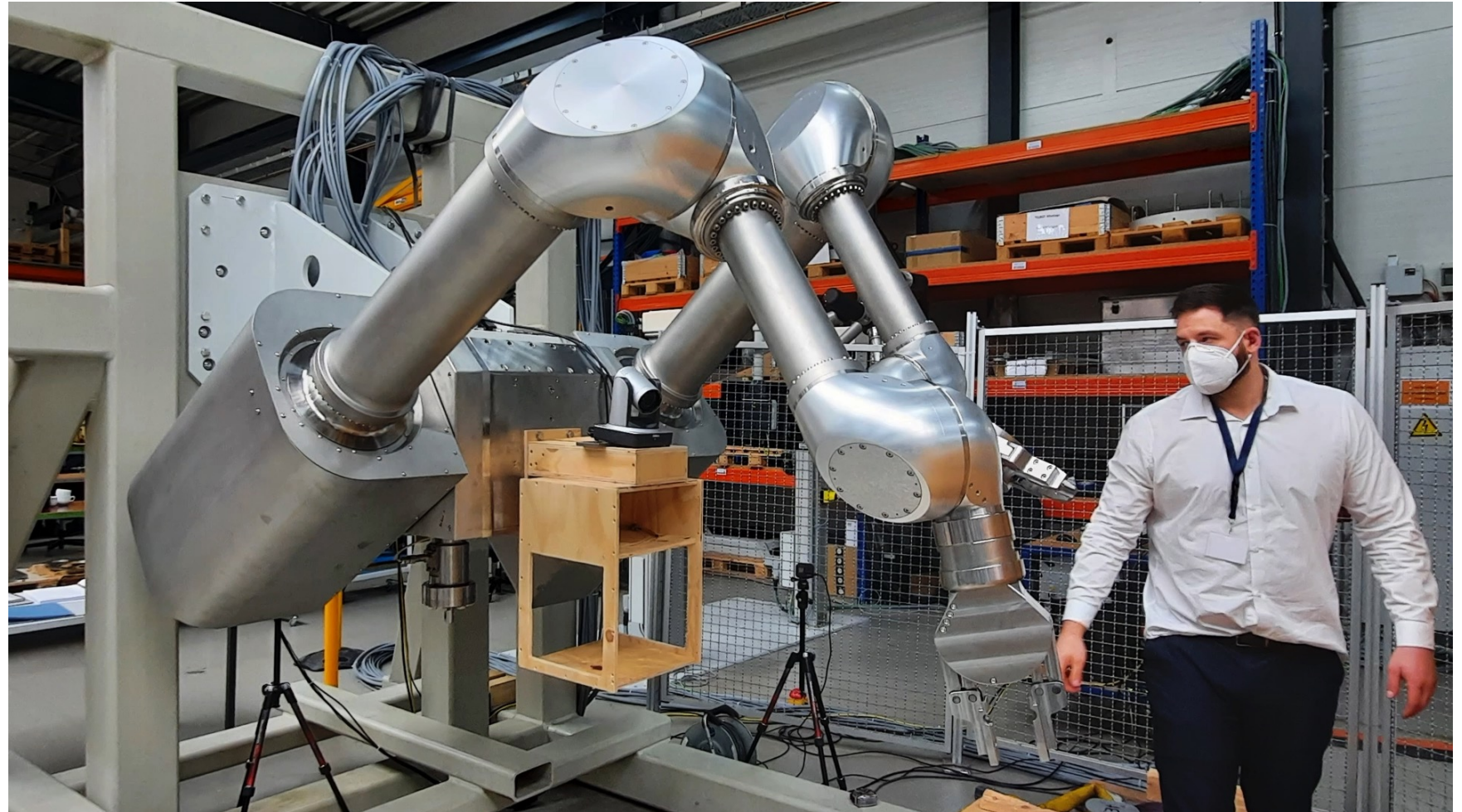


Robotic Handling System

Current Status

Contract: James Fisher
Nuclear
Design, **build** and
install.

- Design: Q2 2022
- FAT(arms): Q2 2022
- FAT(RHS): Q1 2023
- SAT: Q2 2023



Shaft Cutting Station

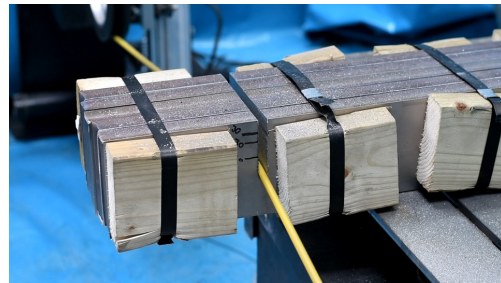
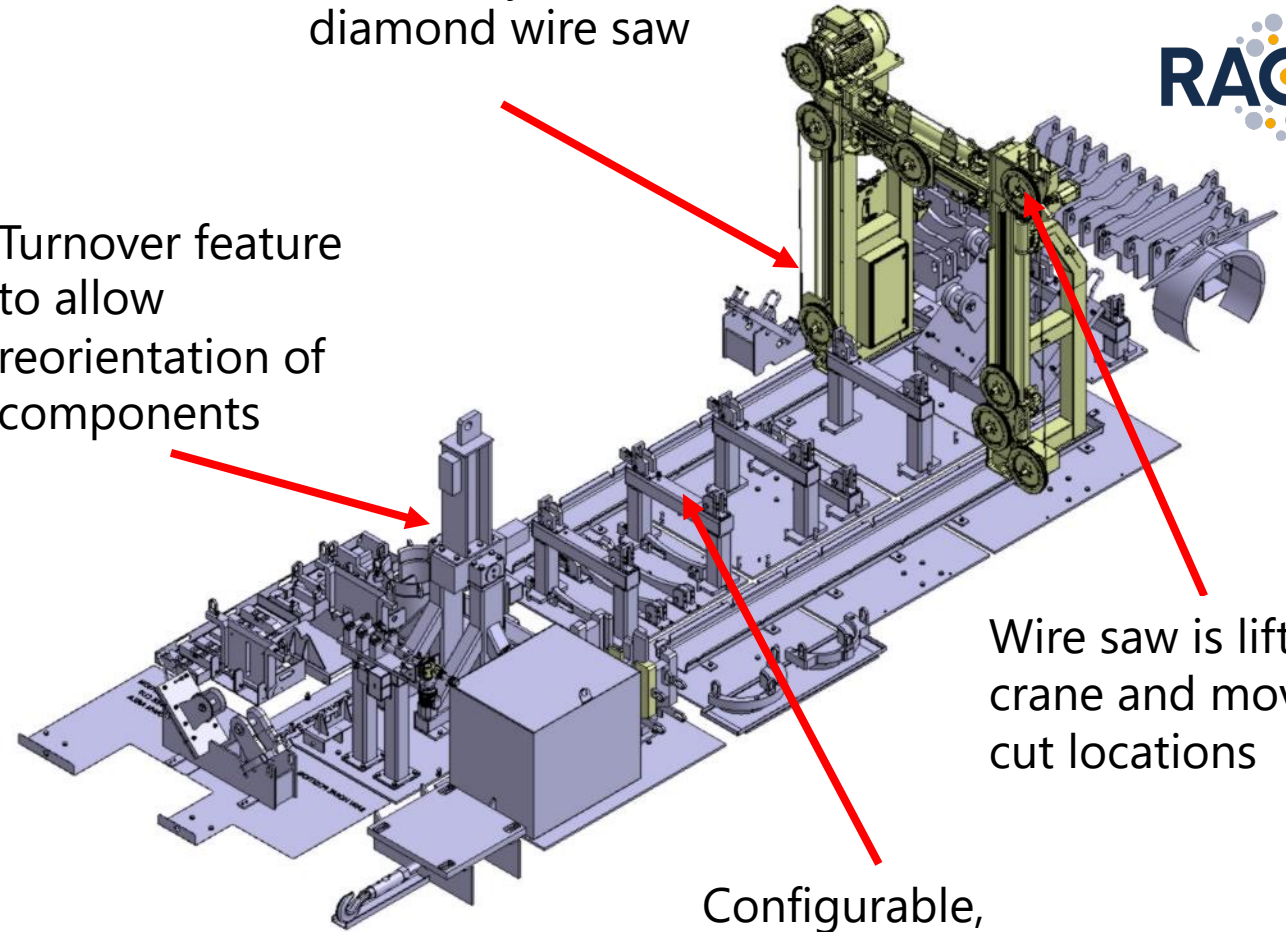
Current Status (more from Harry Robinson later) Electrically driven diamond wire saw



Contract: Aquila
Design, build and install

➤ SAT: Q3 2022

Turnover feature to allow reorientation of components



Machining Station

Current Status

Contract: James Fisher Nuclear Design, **build** and install

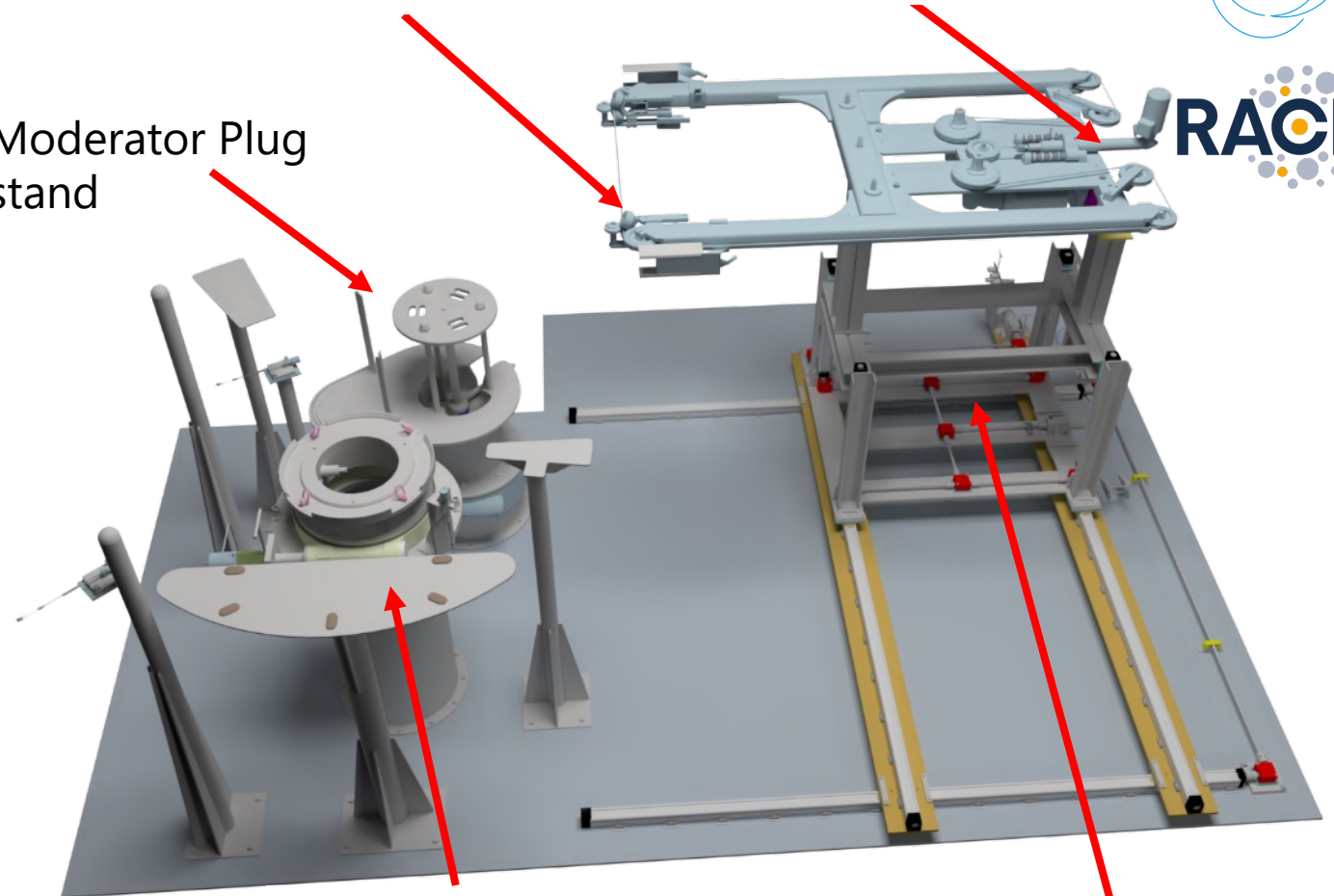
➤ FAT: Q1 2023

➤ SAT: Q2 2023

Moderator Plug stand

Electrically driven diamond wire saw

Saw can rotate to vertical or horizontal



Target Wheel stand

X-Y-Z linear axis of motion



Site Progress

(Target)



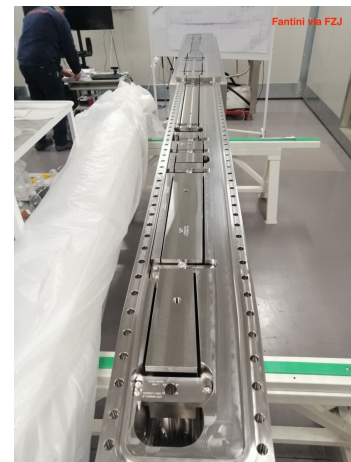
Project Highlights - Target



Target wheel ribs in place and finished welding.



Target wheel assembled in ESS (image does not show shaft)

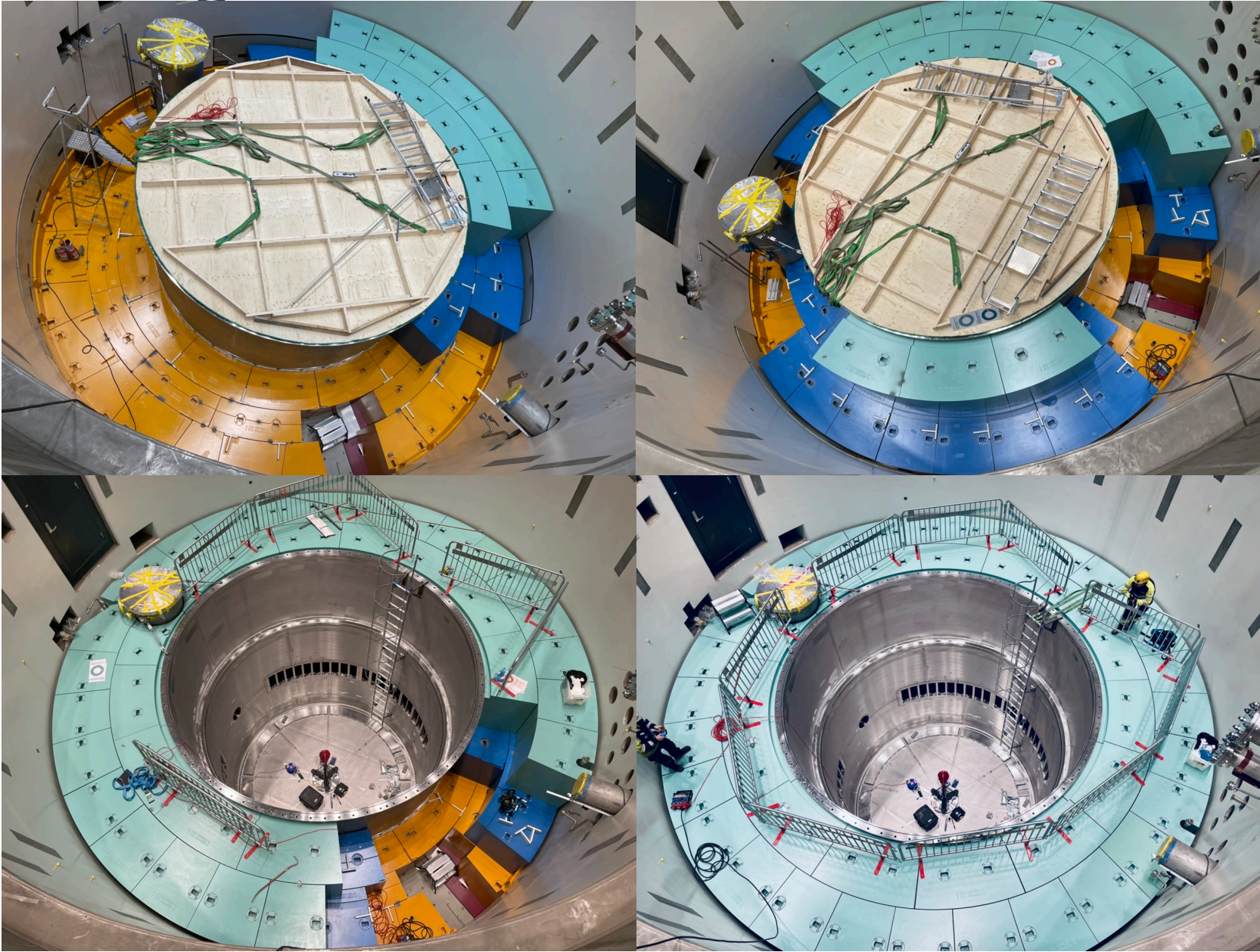


**Moderator Reflector Plug (top)
Neutron Beam Port Block (left)
Open NBPI with back fillers installed (right)
before shipment to ESS for neutron optics**

Monolith Vessel installation



Target Monolith



All shielding outside the monolith vessel is in place. Roughly 1700 tons in the form of stacked cast iron blocks.

MUTS (Testing in...)

Mock-up and Test Stand



A view of the Target Wheel disk from beneath will become a rare thing

Photos from site

Site View 2022-09





Many thanks!

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