



THE ITER PROJECT IN 2023

PROGRESS AMID CHALLENGES

Pietro Barabaschi, Director-General
Annual Symposium 2023 on the ITER/BA Activities





WORKSITE CONSTRUCTION & COMMISSIONING HIGHLIGHTS

- Most plant support systems are operational or in commissioning.
- Civil works are 80% completed.



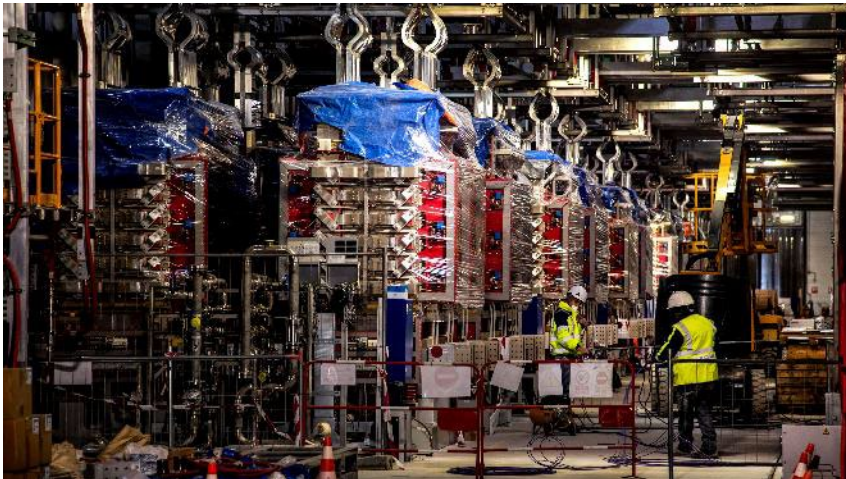
ONSITE PROGRESS IN CONSTRUCTION & INSTALLATION

Reactive power compensation equipment largely installed



Cooling water system fully installed and commissioned

Magnet power conversion equipment largely installed



Cryogenics plant: installation is complete, pre-commissioning underway.

ONSITE PROGRESS IN CONSTRUCTION & INSTALLATION

Control building
ready for
equipment
installation



Final concrete
pour of Tritium
Building
October 2023



First two Central
Solenoid Modules
stacked and are
being aligned

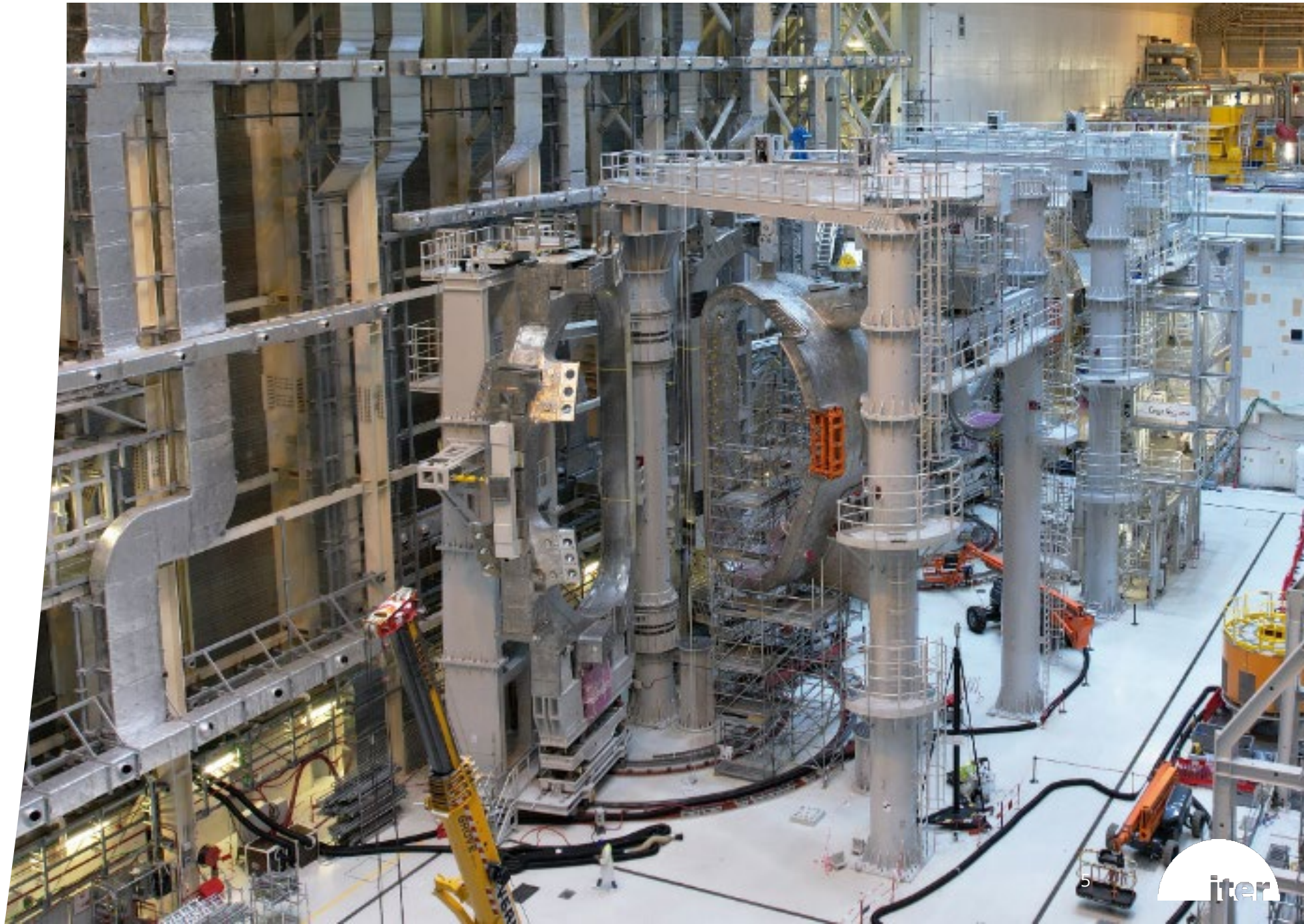


PF Coils Building
being repurposed
for component
repairs and port
plug testing

ASSEMBLING THE MACHINE:

ITER Assembly Hall

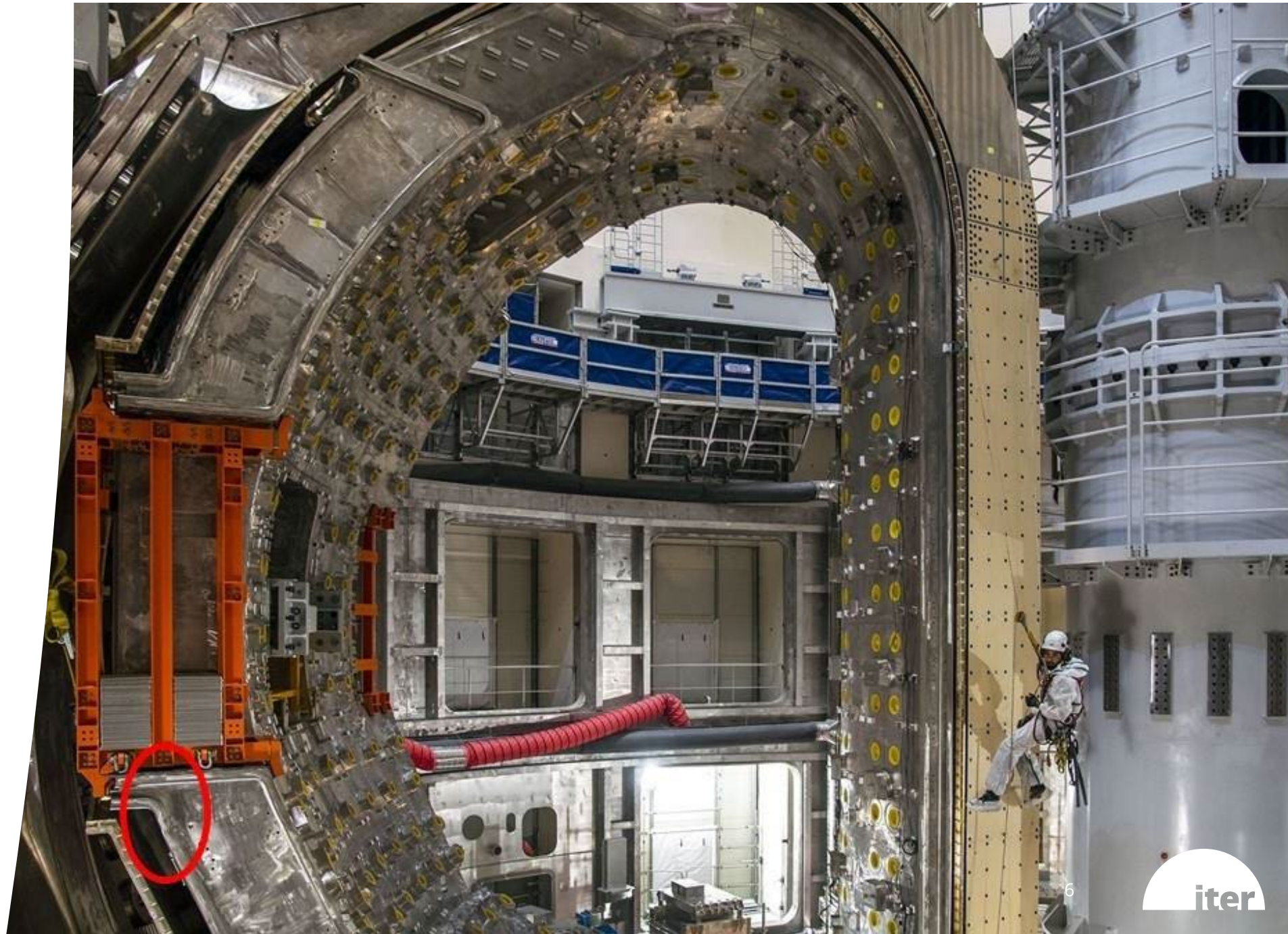
September 2023

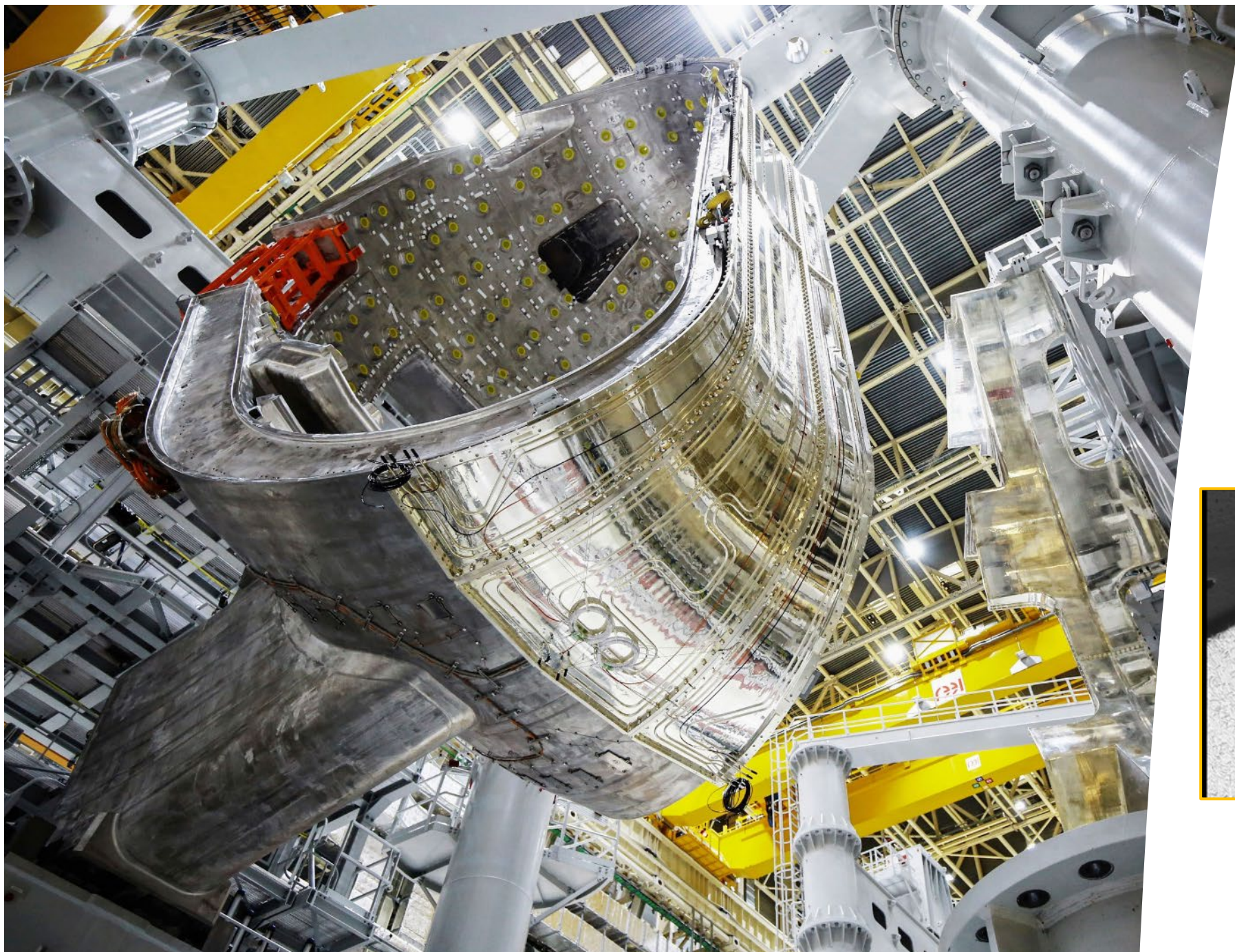


CHALLENGES OF FIRST-OF-A-KIND COMPONENTS

Vacuum Vessel sectors have
geometric non-conformities in
the field bevel joints.

=> Repair Started.

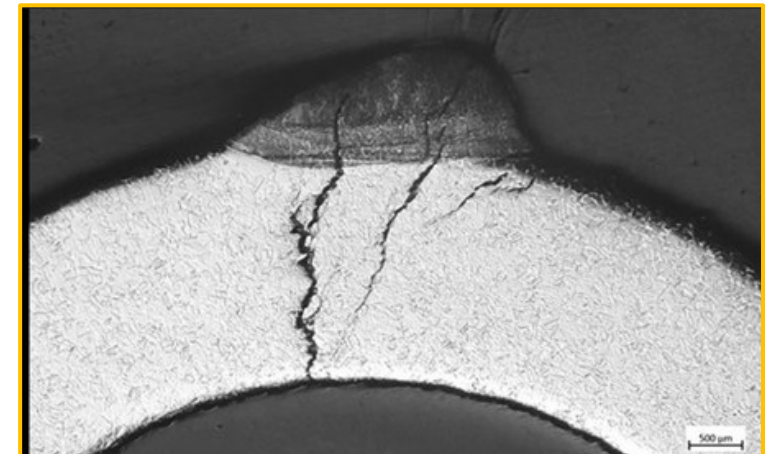




CHALLENGES OF FIRST-OF-A-KIND COMPONENTS

Leakage identified in thermal
shield cooling piping due to
chloride stress corrosion.

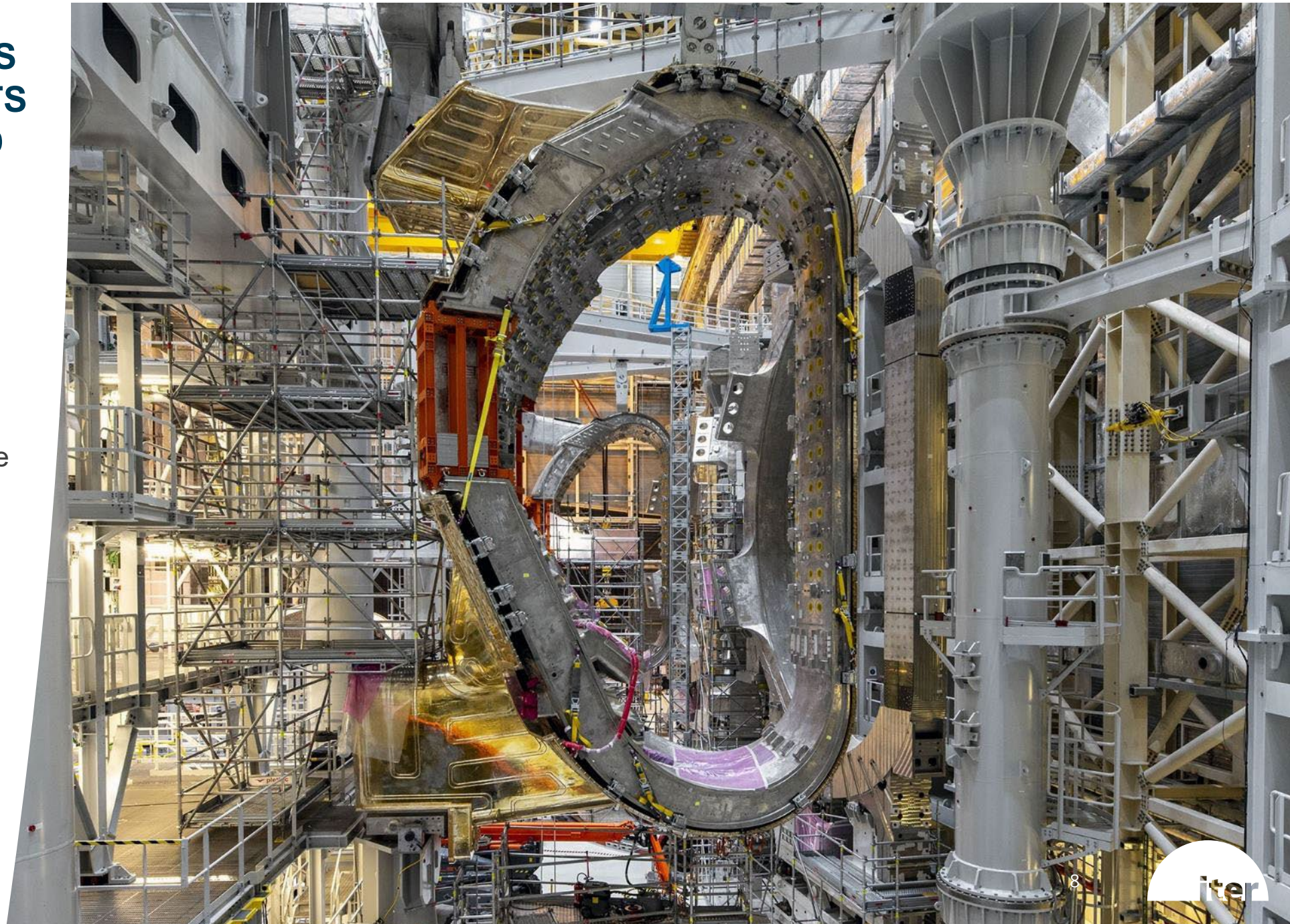
=> Repair Started.



STATUS OF REPAIRS TO VV BEVEL JOINTS & THERMAL SHIELD COOLING PIPES

Repairs are well underway according to the defined strategy.

- VV Sector 6 removed from the tokamak pit
- VV Sectors 6 and 7 have been disassembled
- All TS piping has been removed, repairs and replacement underway



MANUFACTURING AND DELIVERIES CONTINUE IN 2023

Cryostat lid
completed by
India and in
storage



More “in-cryostat”
feeder
components
delivered from
China



Last Toroidal Field
Coil from Japan
arrived onsite



Last Toroidal Field
Coil from Europe
arrived onsite

MANUFACTURING AND DELIVERIES CONTINUE IN 2023

Fourth Central Solenoid module delivered from USA



Eight cold valve boxes delivered by Europe

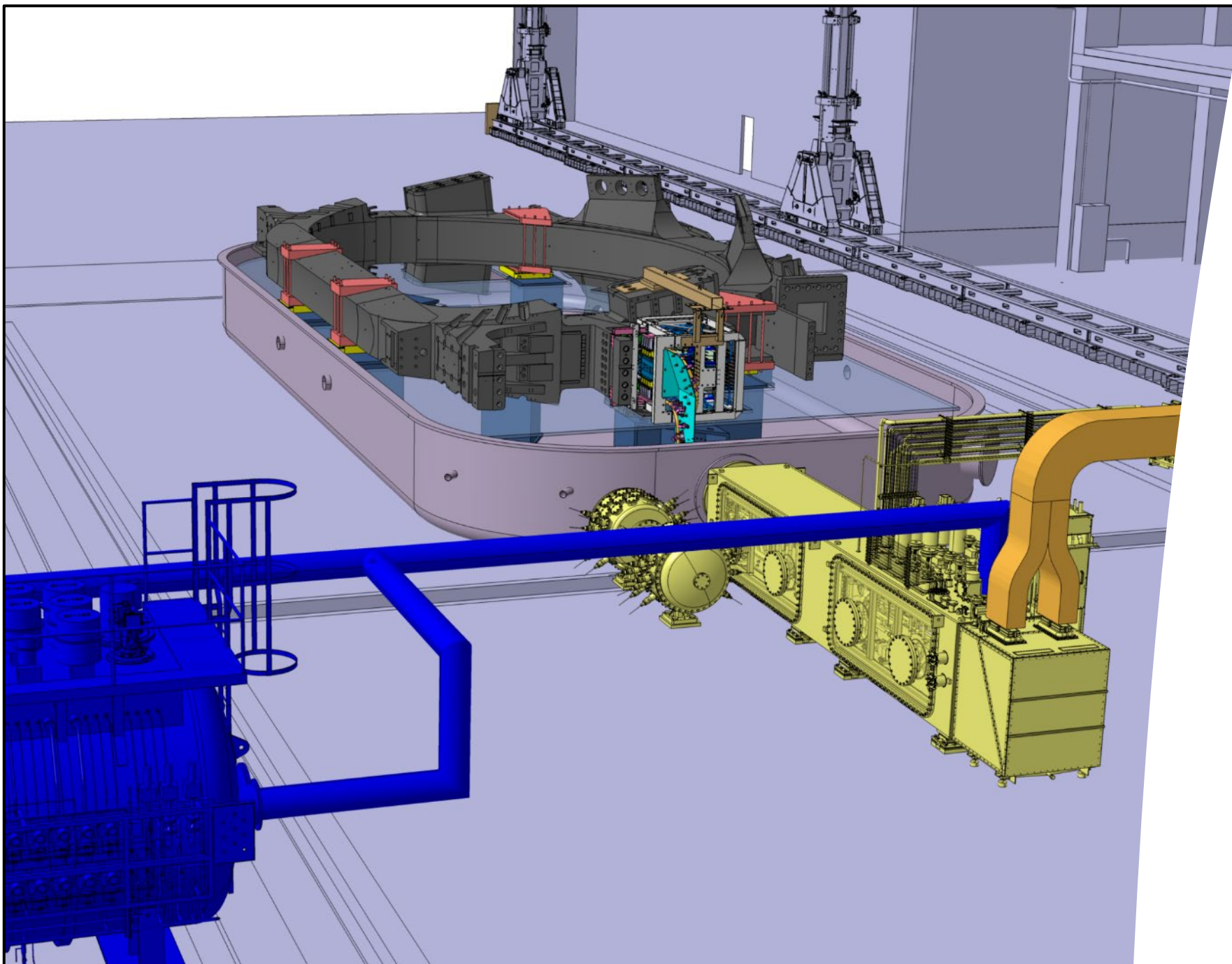


Last AC/DC converter unit delivered from Korea



Poloidal Field Coil #1 delivered from Russia

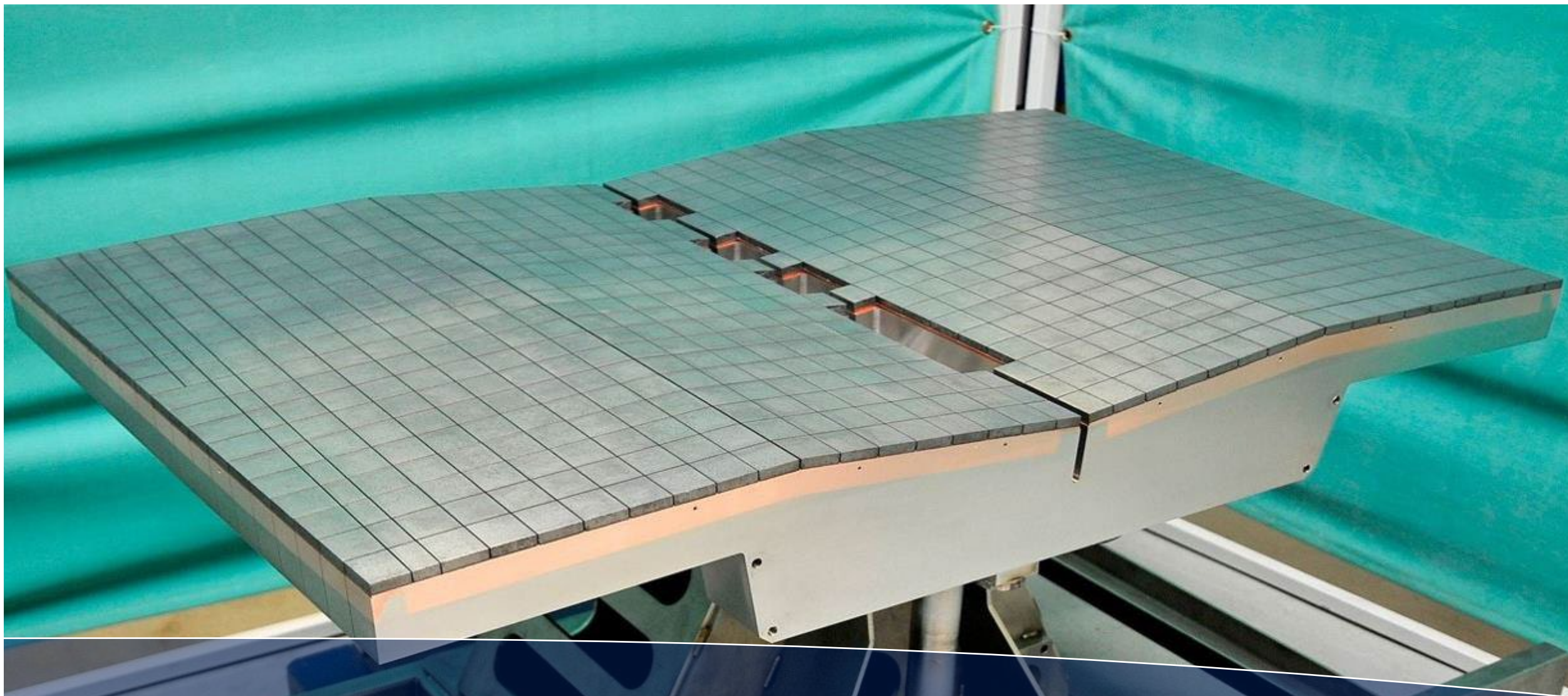




TF/PF COLD TESTING

... to mitigate risks of superconducting magnets

- Cryostat to accommodate TF coils and PF1 coil.
- A complete unit of energization (up to 67kA for TFs) and associated fast discharge unit.
- Connection to ITER's existing Cryogenic plant, using 1 of 3 Helium refrigerators to cool the coils at 4 Kelvin.



CHANGE IN FIRST-WALL MATERIAL

Will change Blanket First Wall armour material from **Beryllium** to **Tungsten**

- Reflects the understanding of ITER as a precursor to DEMO machines



MOVE TO TWO-PHASE DT OPERATIONS

- Essentially a 2-stage safety demonstration
- Goal: early start of Nuclear Operations

PREPARING AN UPDATED BASELINE BY MID-2024

Current ITER cost and schedule “baseline” was set in 2016.

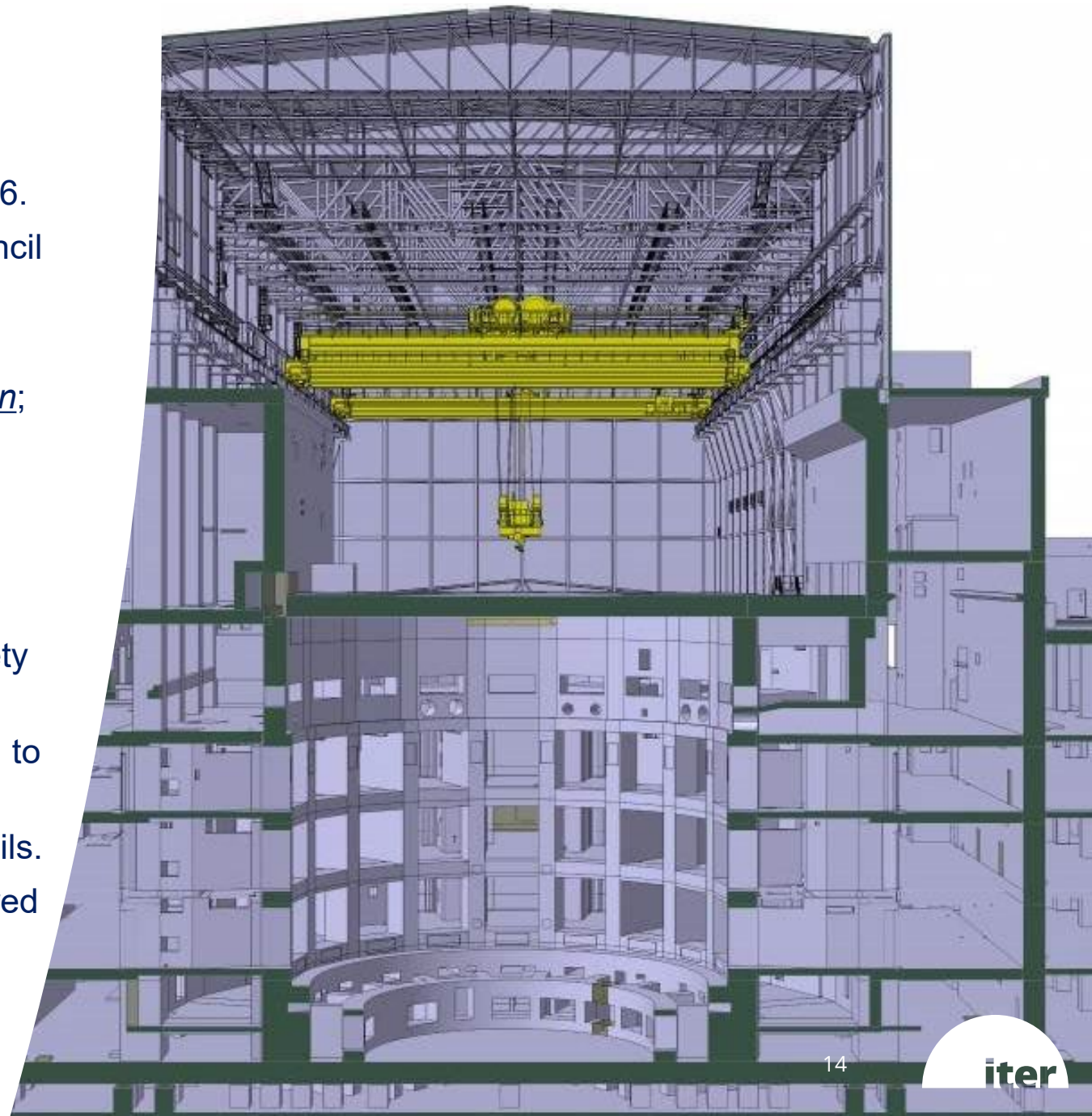
Review underway; will present new baseline to ITER Council in 2024.

Overall objective:

- Achieve $Q=10$ as soon as possible, *with a realistic plan*;
- Mitigate risks where possible.

Key considerations:

- Delays from Covid-19 pandemic and FOAK technical challenges.
- Ensuring alignment with ASN, the French nuclear safety regulator.
- Reconsideration of Vacuum Vessel welding sequence, to control deformations.
- 4 Kelvin testing of some Toroidal and Poloidal Field coils.
- Adjustments to original “*first plasma*” campaign, followed by two DT operational phases.





Thank you!

ITER Meeting with Japanese Prime
Minister Fumio KISHIDA
30 November 2023

