



Science and
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Facilities Council

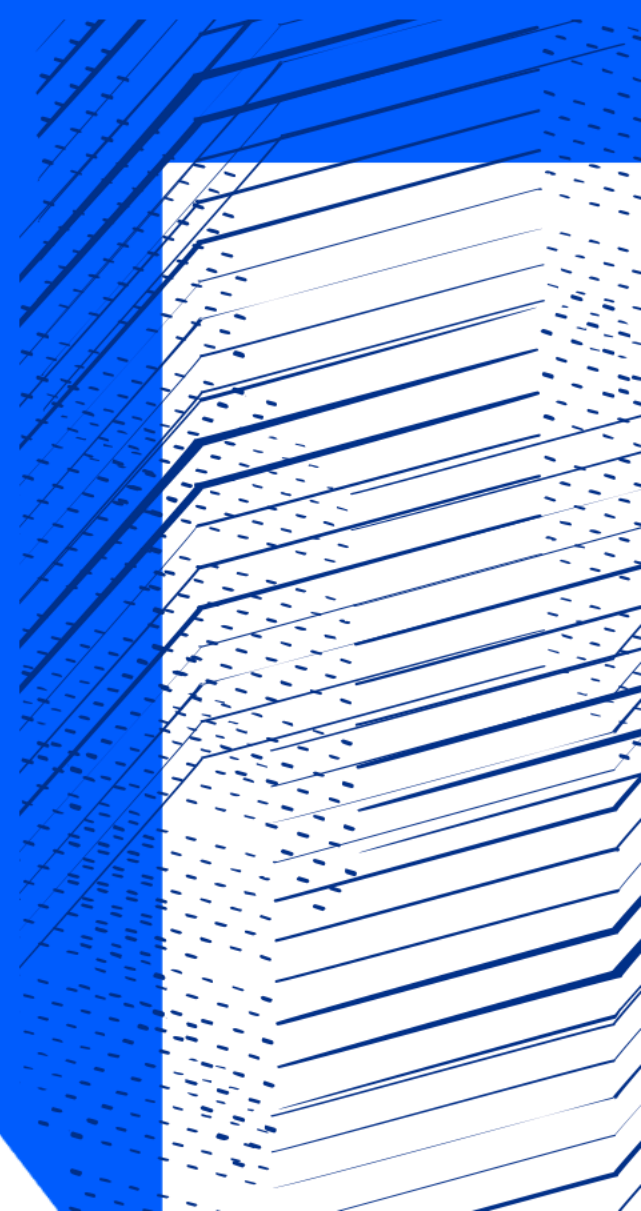
RFD Survey and Alignment - Assembly Requirements

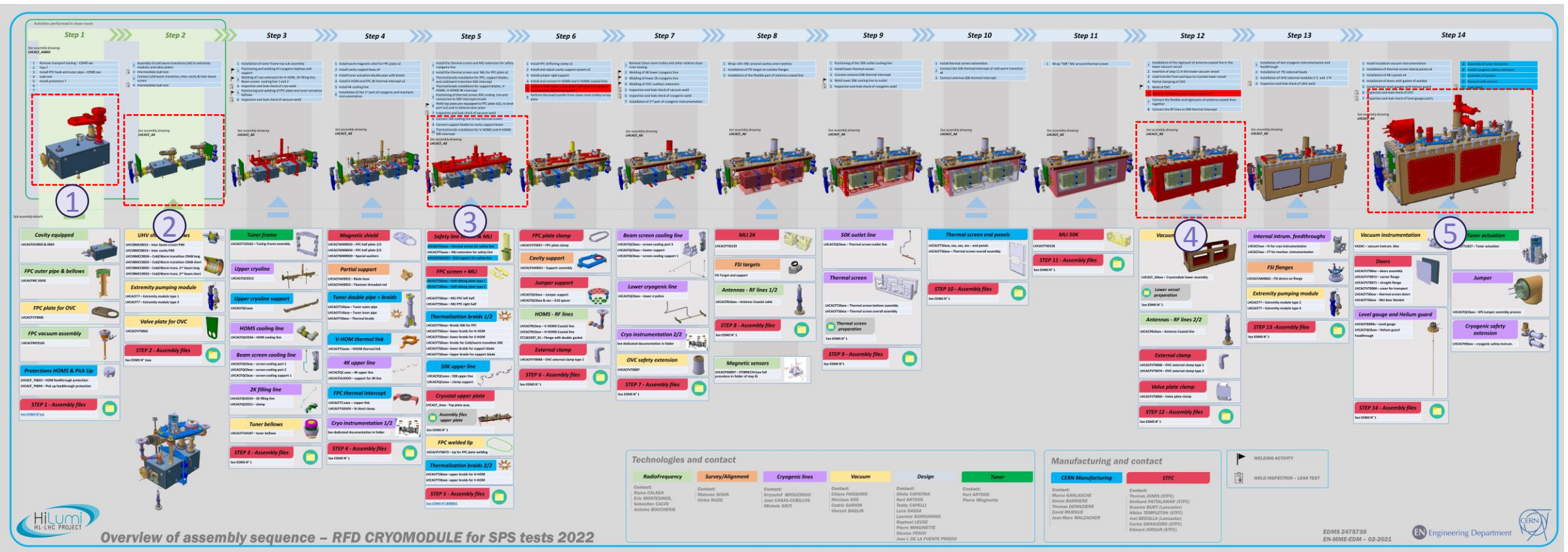
01/03/2021

Edward Jordan



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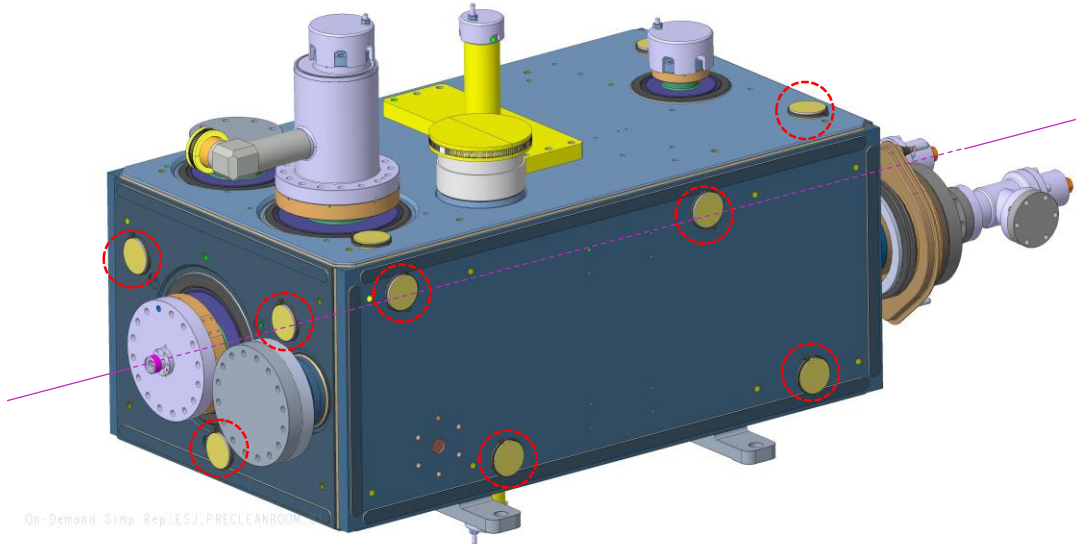




- 5 distinct operations require precise alignment (in main assembly flow)

1

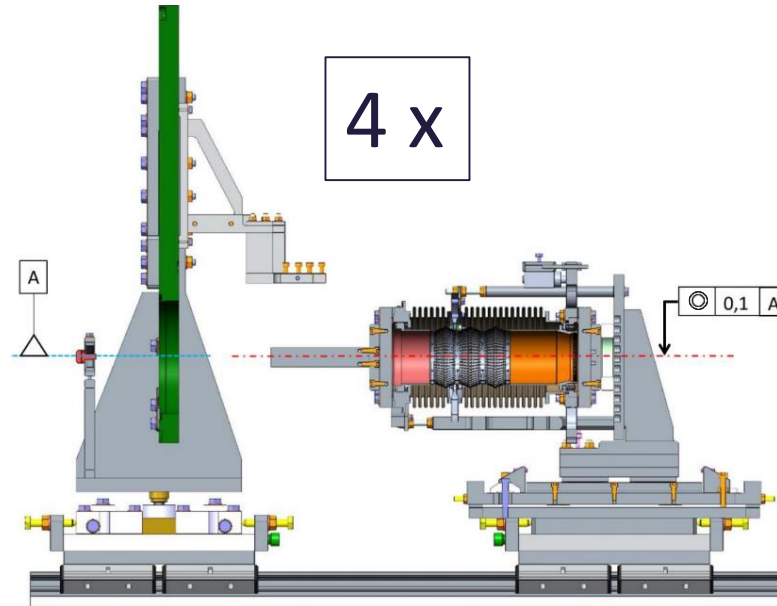
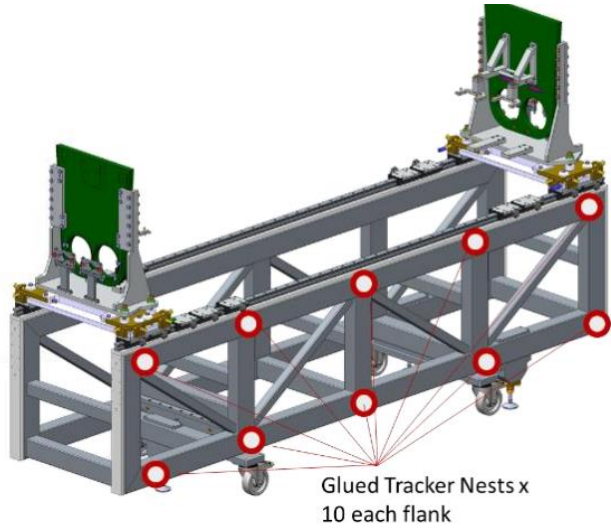
Cavity Arrival at DL (UKRI STFC)



Cavity arrive at DL with magnetic centre fiducialised to “Fiducial Layout” (ST1339259 / 253-11488)

2_a

Valve plate pre-assembly weld

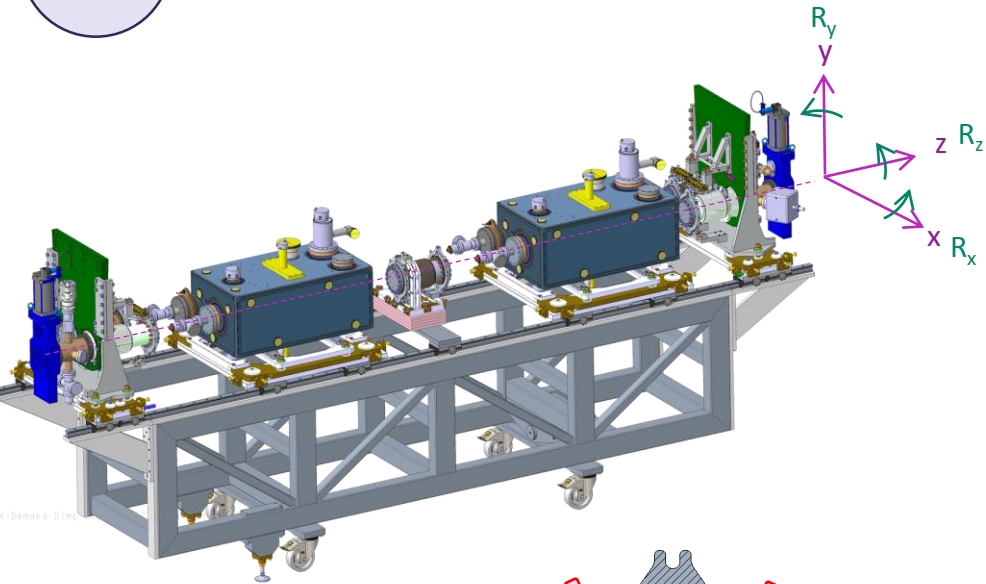


Alignment tasks required during assembly of CWT to valveplate
(see [1237-meng-pdure-0003-v0.1-valve plate assembly procedure \(pre cleanroom\)](#))

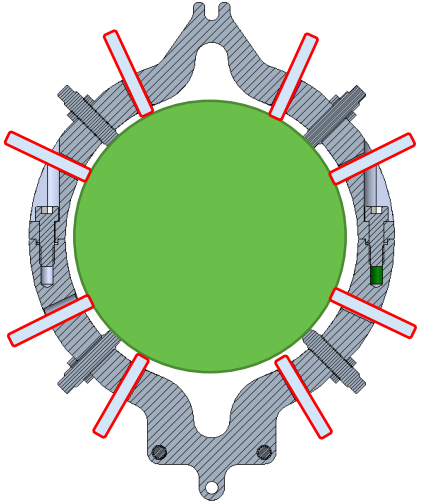
2

Cavity String pre-assembled on string trolley

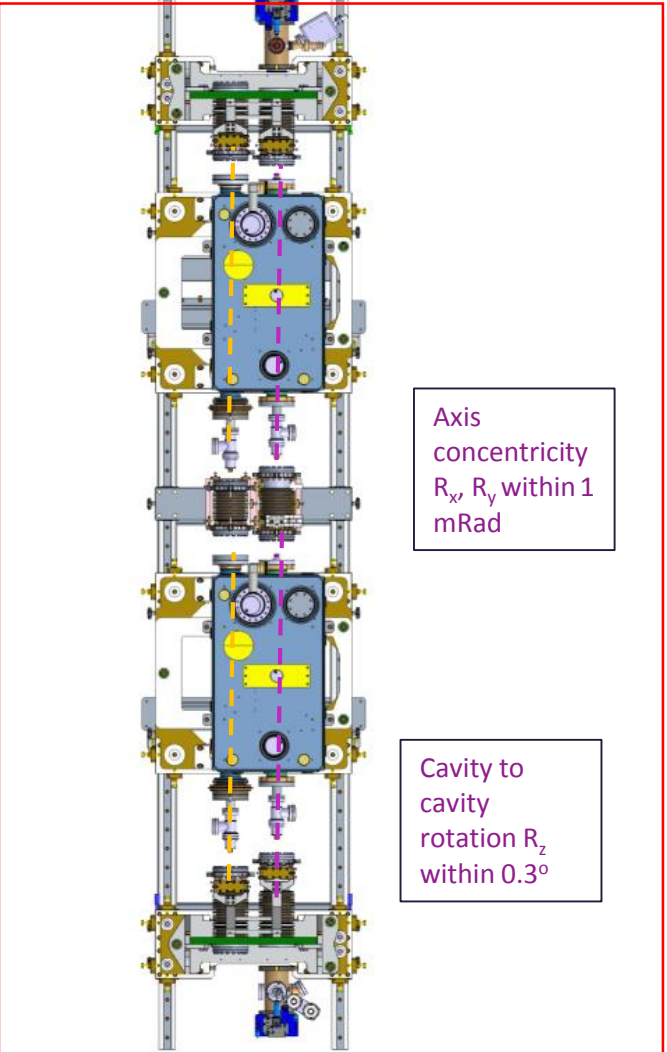
(values informed from EDMS no. 1578808 v.o)



On-Demand Sim



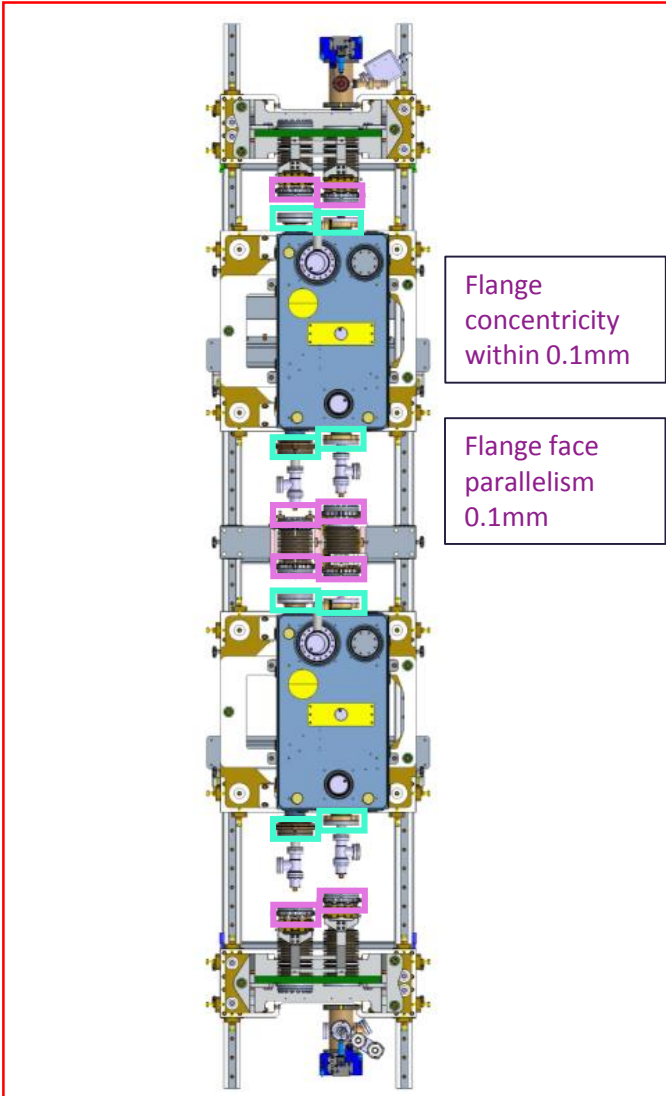
Survey tool measurement location determined by hole runout



Axis concentricity R_x, R_y within 1 mRad

Cavity to cavity rotation R_z within 0.3°

Align cavity axis' (fiducial nests)



Flange concentricity within 0.1mm

Flange face parallelism 0.1mm

Align flange pairs (Rotatable Flange Tooling/ Fixed Flange pair)

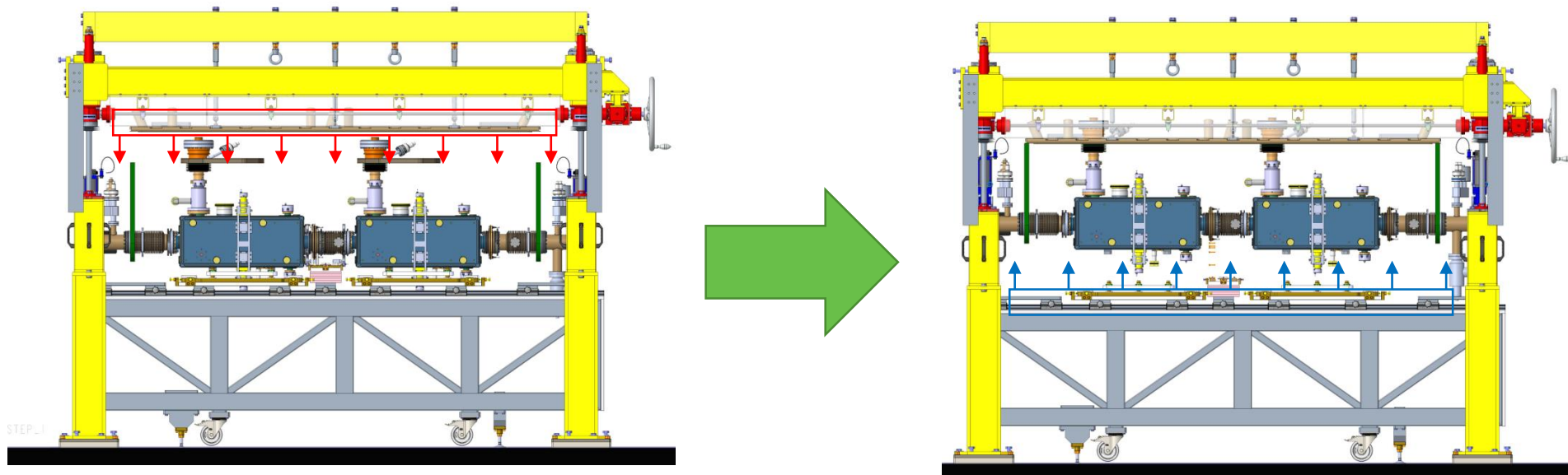


3

Align top plate to string on trolley

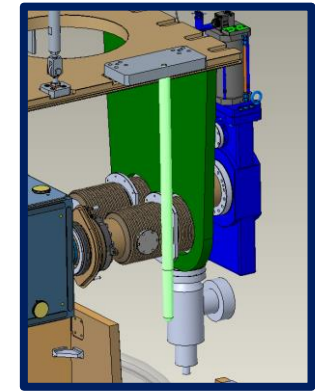
- Valve plates,
- FPC
- Blades (not shown)

(MLI 2K & 50K, Thermal Screen Not shown)

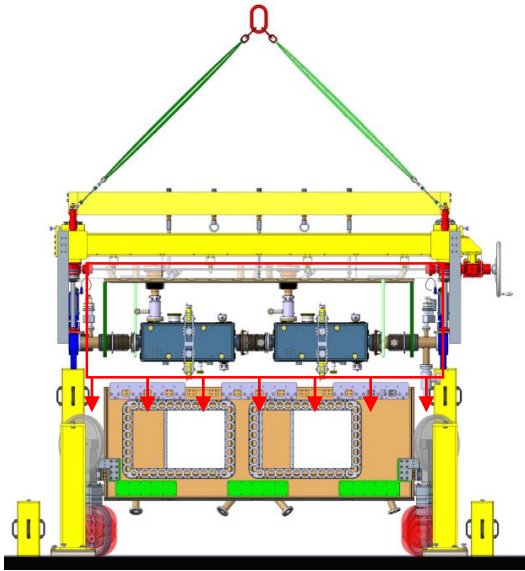
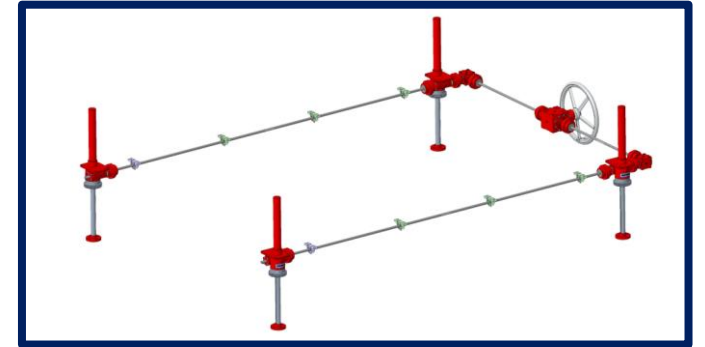


Align top plate equipped to cryomodule

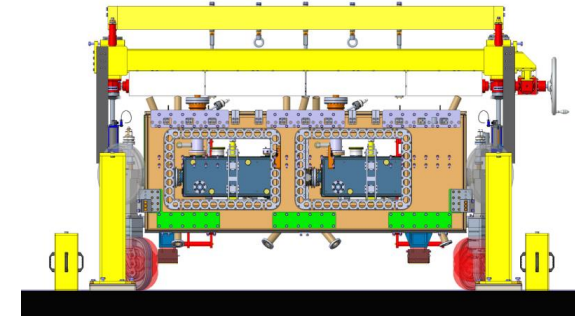
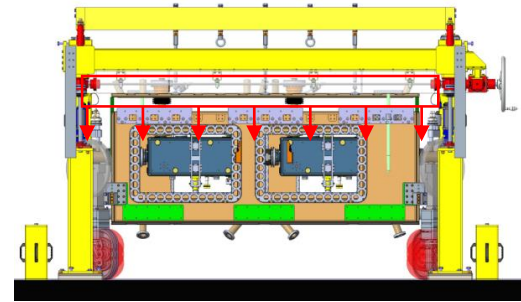
- Coarse lower with crane – Mechanical Alignment guides



- Precise lower with screwjacks system – use tracker



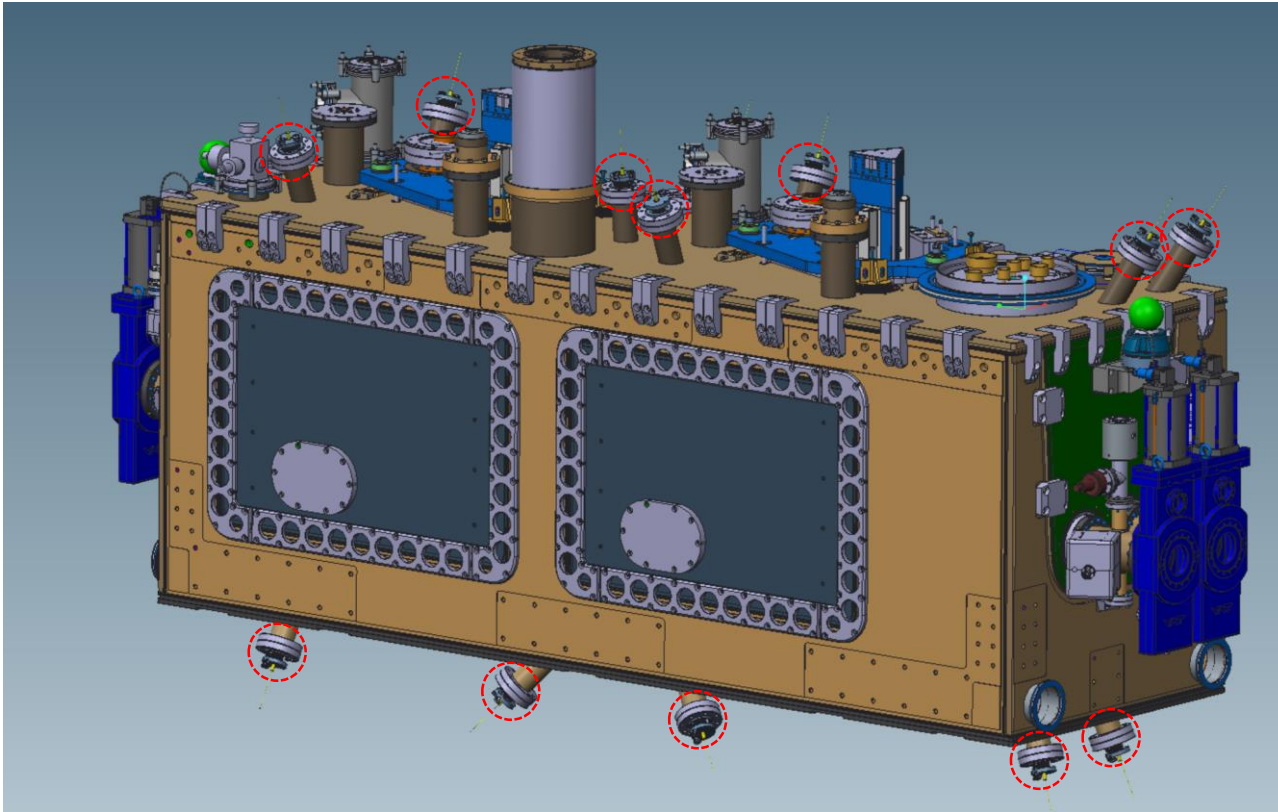
Crane



Screwjack

5

Final Survey of string w.r.t module (FSI Ports)



Are FSI HEADS
calibrated at CERN?