

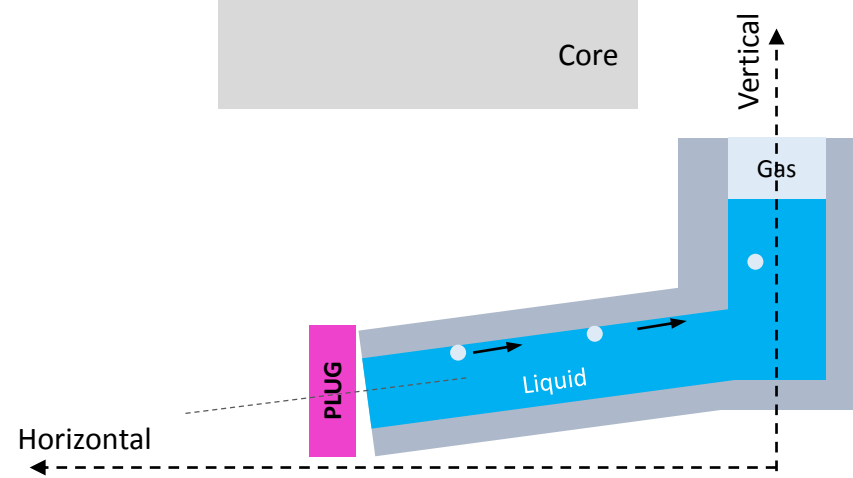
# Status of DFX design

Interfaces, tunnel integration aspects, design status & open points

WP6a-SOTON DFX design team

# Integration:

- Specifications
  - Route gas bubble to LHE-GHE interface
  - →  $0.7^\circ$  slope Vs horizontal
  - Core is vertical
  - LHC tunnel is tilted  $\approx 0.7^\circ$  at P1 and P5



- → Each DFX present the same angle Vertical to horizontal section to evacuate GHE bubbles

**Point5** : tunnel tilted  $\approx 0.7^\circ$

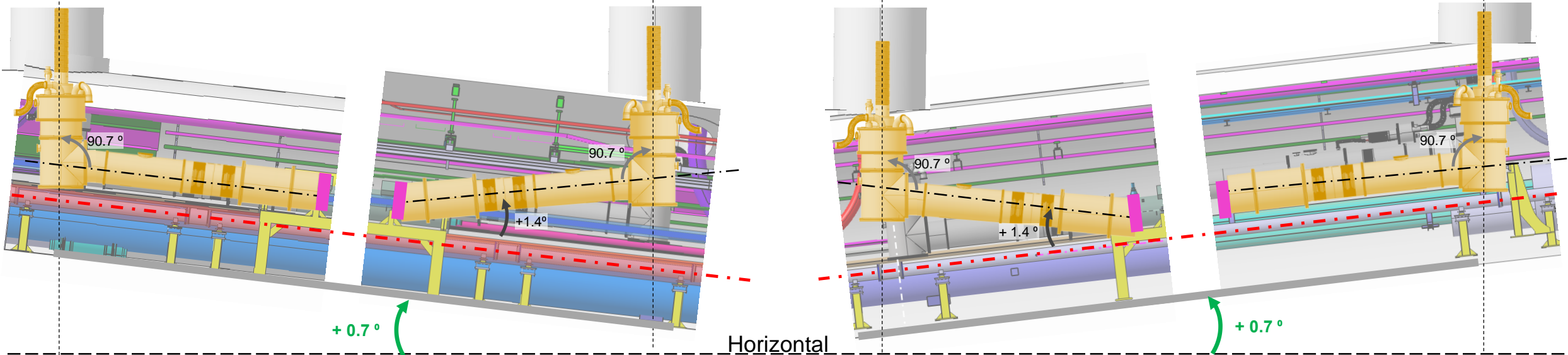
**Point1** : tunnel tilted  $\approx 0.7^\circ$

**L5**: Horizontal DFX // to beam axis

**R5**: Horizontal DFX  $1.4^\circ$  to beam axis

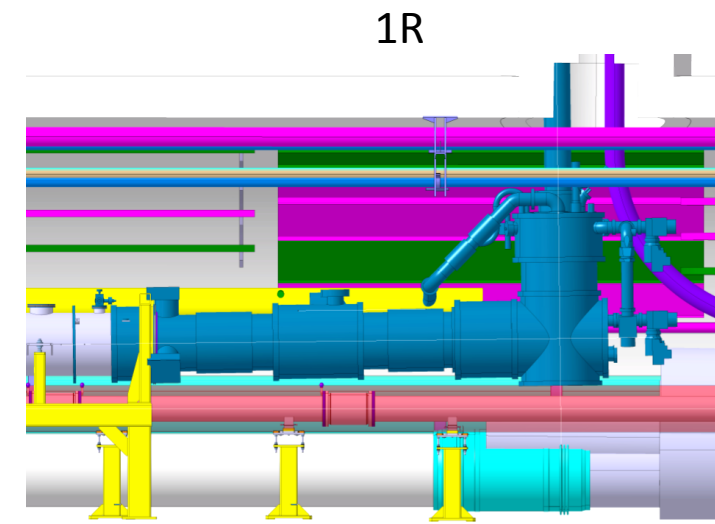
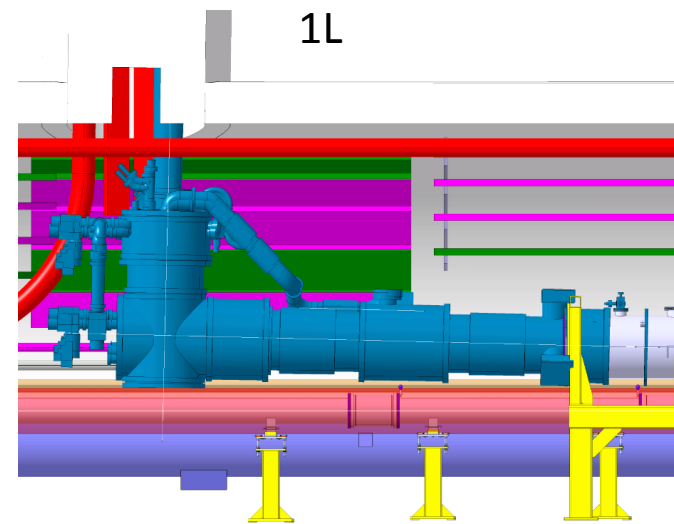
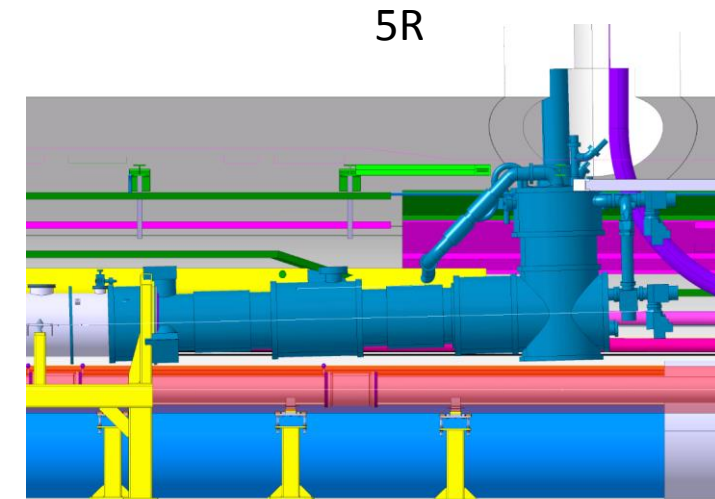
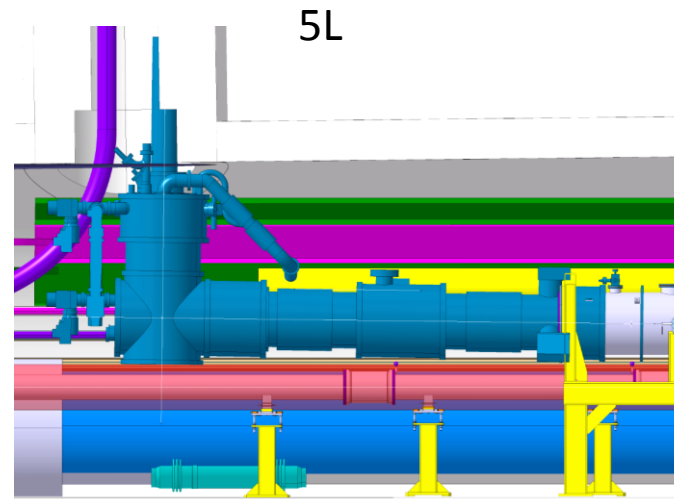
**L1**: Horizontal DFX  $1.4^\circ$  to beam axis

**R1**: Horizontal DFX // to beam axis



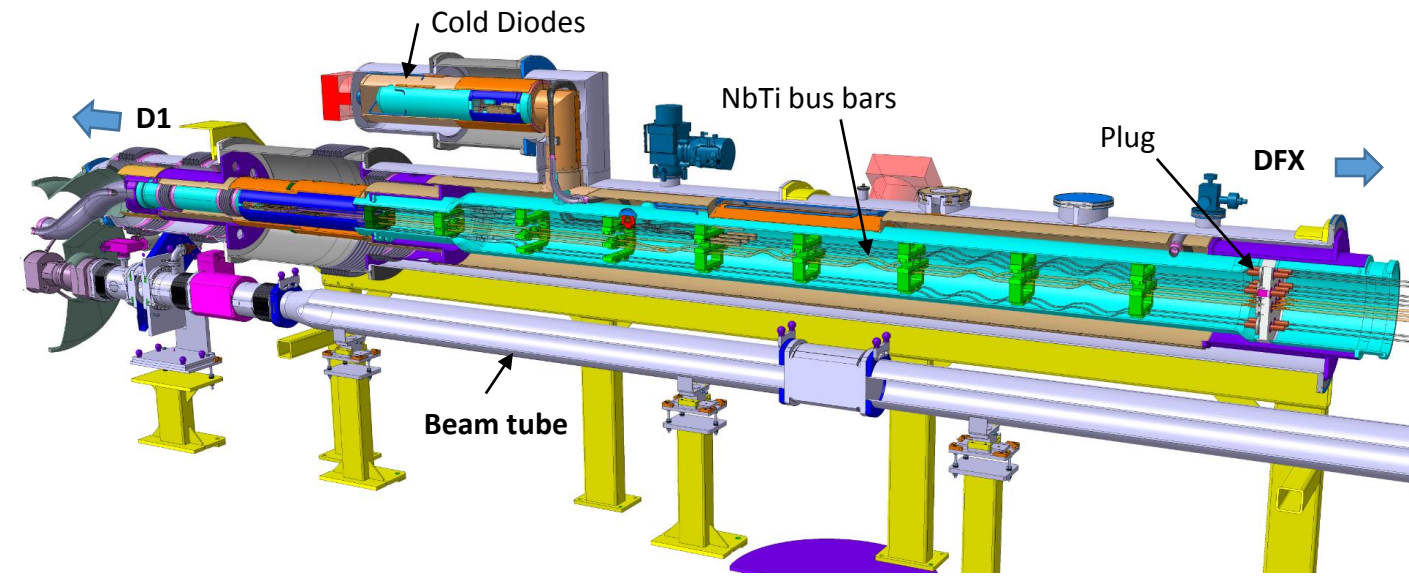
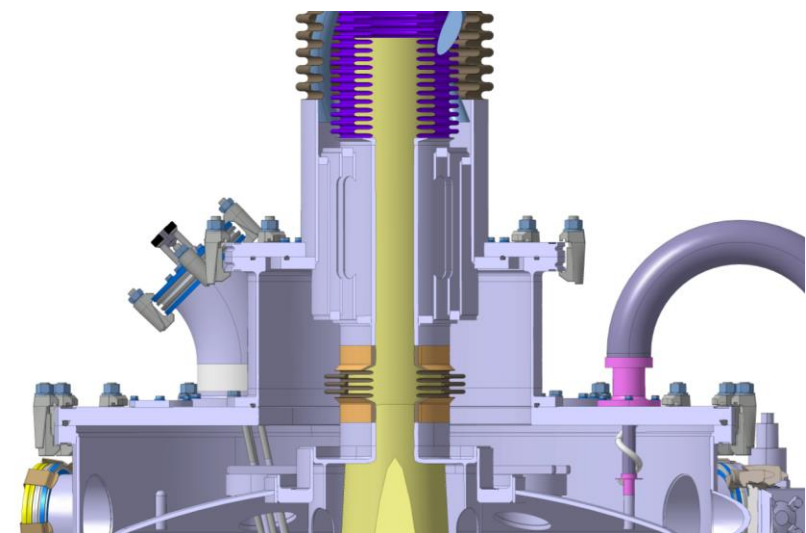
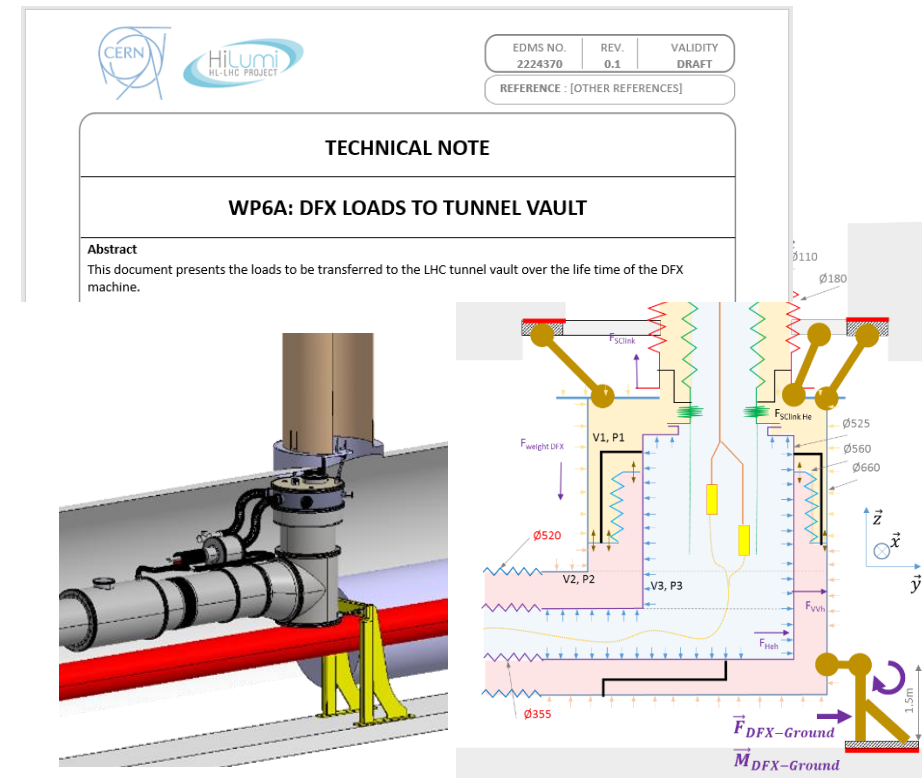
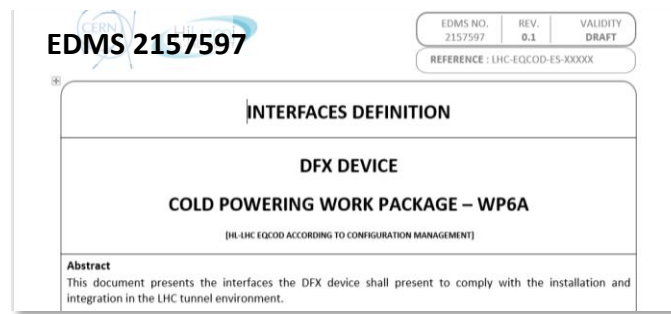
# Integration : progress

- 4 Preliminary simplified models in 3D (WP15)
  - **P5 Left**: interference with beam reservation, few cm clearance at top
  - **P5 Right**: No critical interference
  - **P1 Left**: No critical interference
  - **P1 Right**: Some interferences with services
- Next iteration:
  - Raise all DFX top references by 20 mm
    - → remove interference with beam reservation
    - → increase slope for helium gas bubbles
  - Create new 3D models inclined when DFX horizontal design is validated



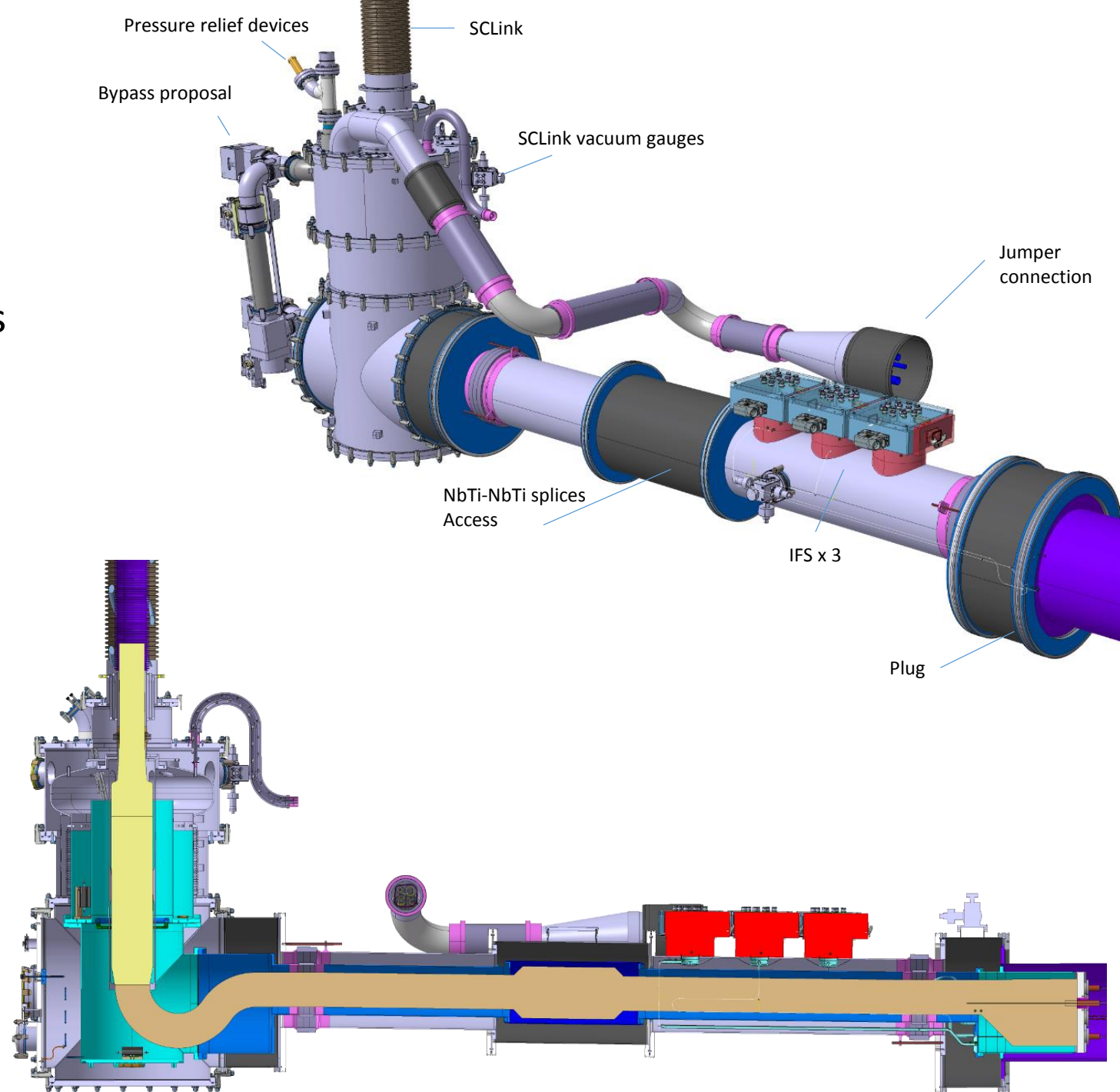
# Interfaces: status

- Dedicated document EDMS 2157597
- To LHC tunnel & Core
  - Vertical 3.5 tons ; Longitudinal [-2;+5] tons
  - → iteration to reduce horizontal bellows  $\emptyset$
- DCM module : **defined**
- SCLink interface : **defined**, drawings in progress
- Bus-bars : envelope **defined**
- Splice volume: **being** validated
- Beam: volume **defined**
- Cryogenics jumper: WP9 input **defined**



# 3D design status

- Vertical design status
  - 3D model 95% complete
  - Specification 2D drawings : 80%
  - Detailed assembly sequence in progress
  - Ancillaries integration 90% complete (pumps, relief valves)
- Horizontal design optimisation
  - 3D design proposal 70% complete
    - Loads reduction from bellows
      - Longi. by 2 / Vertical by 3
  - Iterations with interfaces for validation
  - IFS flange design in progress



# Open points

- Open points:

- Design:

1. Validate horizontal design with interfaces
2. Supports to LHC tunnel
3. Calculations to confirm sizing and drawings
4. Structure transferring longitudinal loads to ground
5. Ancillaries : IFS, equipment integration

- Technical specification:

- Delivery qualification

