Target complex introduction

HI-ECN3 BDF target & target complex initial review

Jean-Louis GRENARD – WP4

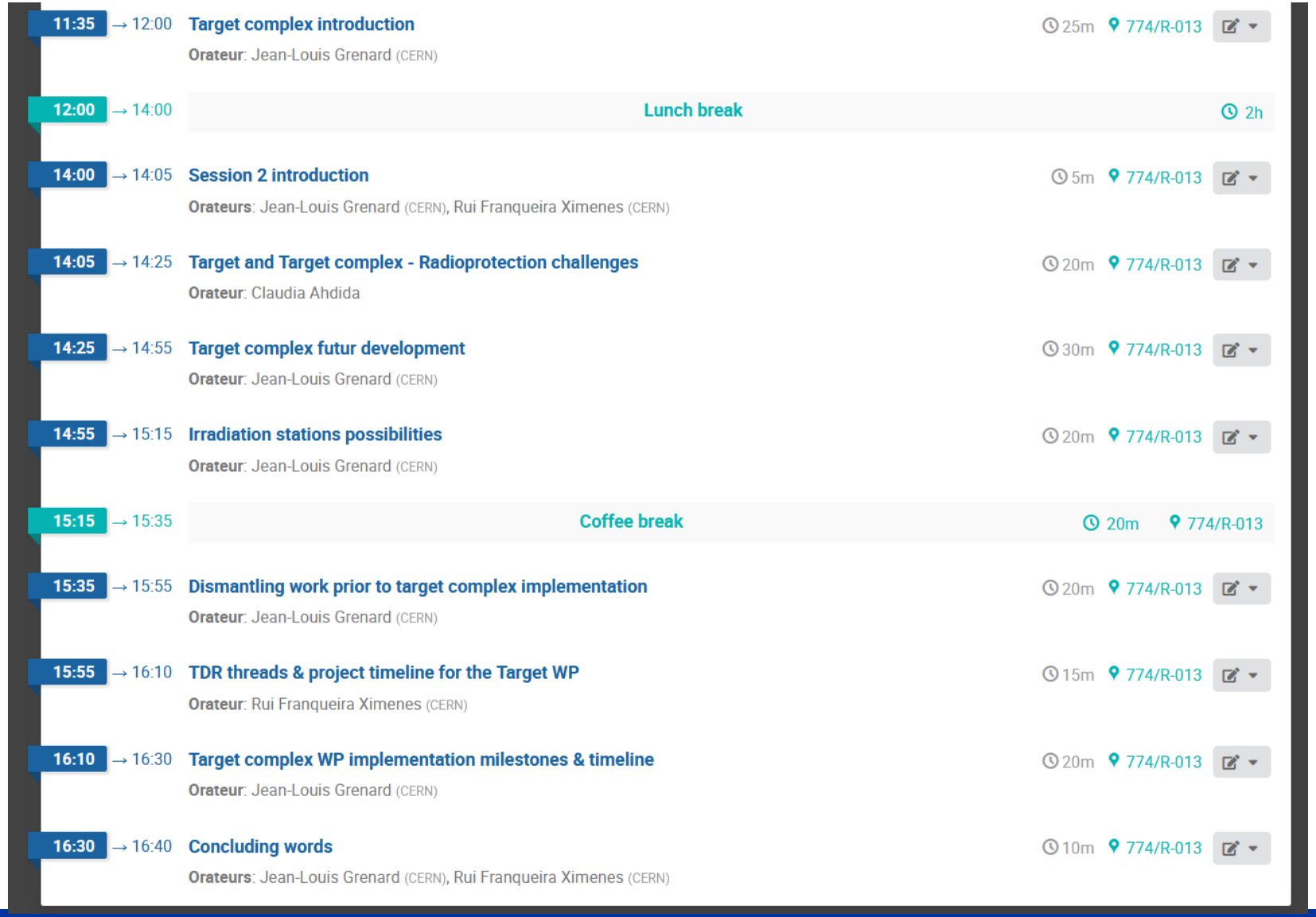
Acknowledgement: J. M. Martin Ruiz, C. Ahdida, M. Calviani, R. F. Ximenes , M. Fraser, R. Jacobsson, L. Krzempek, G. Mazzola, C. Mucher

29-04-2024

Target Complex presentations - goal

- Set the scene with the current design
- Highlight the key challenges
- Detail ongoing and foreseen studies during the TDR phase
- Identification of missing or unclear areas
- Needs of technologies development

Target complex agenda



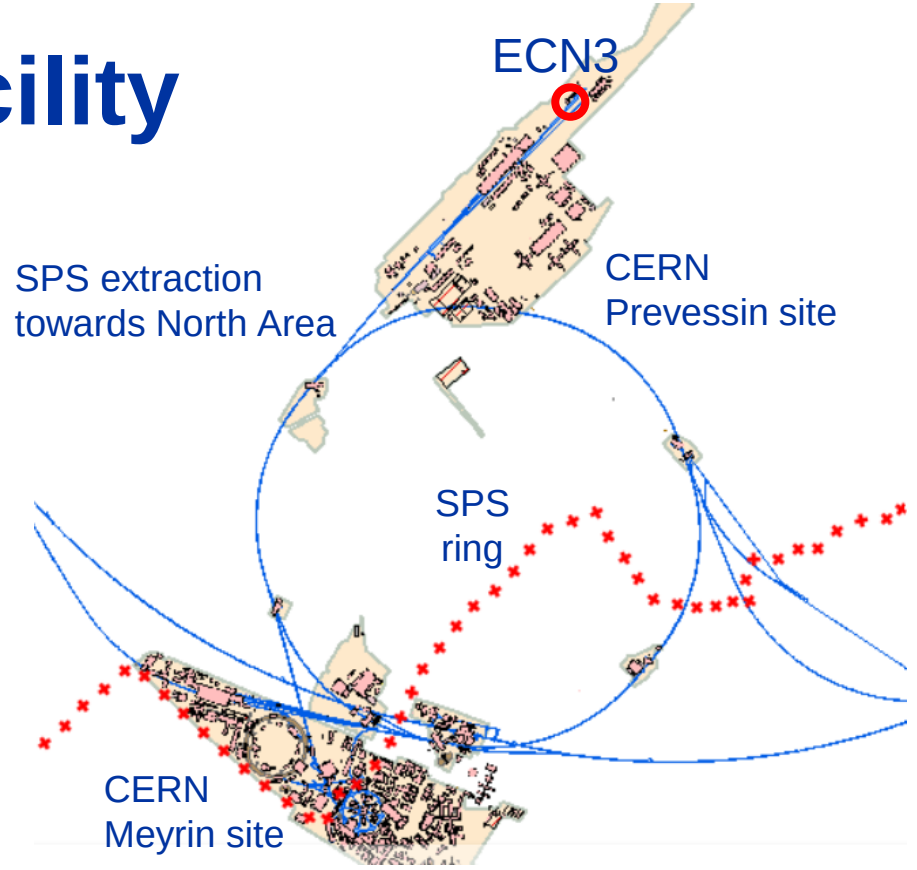
11:35 → 12:00	**Target complex introduction** **Orateur**: Jean-Louis Grenard (CERN)	25m	774/R-013
12:00 → 14:00	**Lunch break**	2h	
14:00 → 14:05	**Session 2 introduction** **Orateurs**: Jean-Louis Grenard (CERN), Rui Franqueira Ximenes (CERN)	5m	774/R-013
14:05 → 14:25	**Target and Target complex - Radioprotection challenges** **Orateur**: Claudia Ahdida	20m	774/R-013
14:25 → 14:55	**Target complex futur development** **Orateur**: Jean-Louis Grenard (CERN)	30m	774/R-013
14:55 → 15:15	**Irradiation stations possibilities** **Orateur**: Jean-Louis Grenard (CERN)	20m	774/R-013
15:15 → 15:35	**Coffee break**	20m	774/R-013
15:35 → 15:55	**Dismantling work prior to target complex implementation** **Orateur**: Jean-Louis Grenard (CERN)	20m	774/R-013
15:55 → 16:10	**TDR threads & project timeline for the Target WP** **Orateur**: Rui Franqueira Ximenes (CERN)	15m	774/R-013
16:10 → 16:30	**Target complex WP implementation milestones & timeline** **Orateur**: Jean-Louis Grenard (CERN)	20m	774/R-013
16:30 → 16:40	**Concluding words** **Orateurs**: Jean-Louis Grenard (CERN), Rui Franqueira Ximenes (CERN)	10m	774/R-013

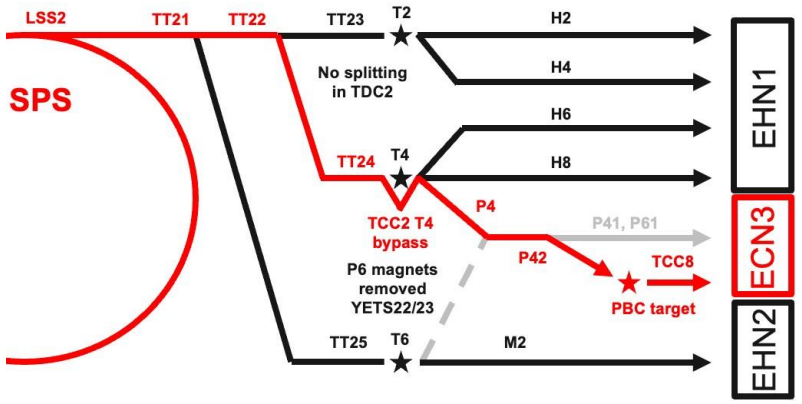
What do we call Target Complex?

- **The target area**
  - Target station which contain the target
  - Associated shielding
  - The space to perform target maintenance activities (inspections, replacement, repair…)
  - Remote handling equipment (crane, spreaders, mobile robots)
  - Confinement(s)
- **The target service building**
  - Air handling units
  - Cooling stations
  - Controls systems
  - The space to perform post irradiation examination and preparation for target (and other activated components) final disposal

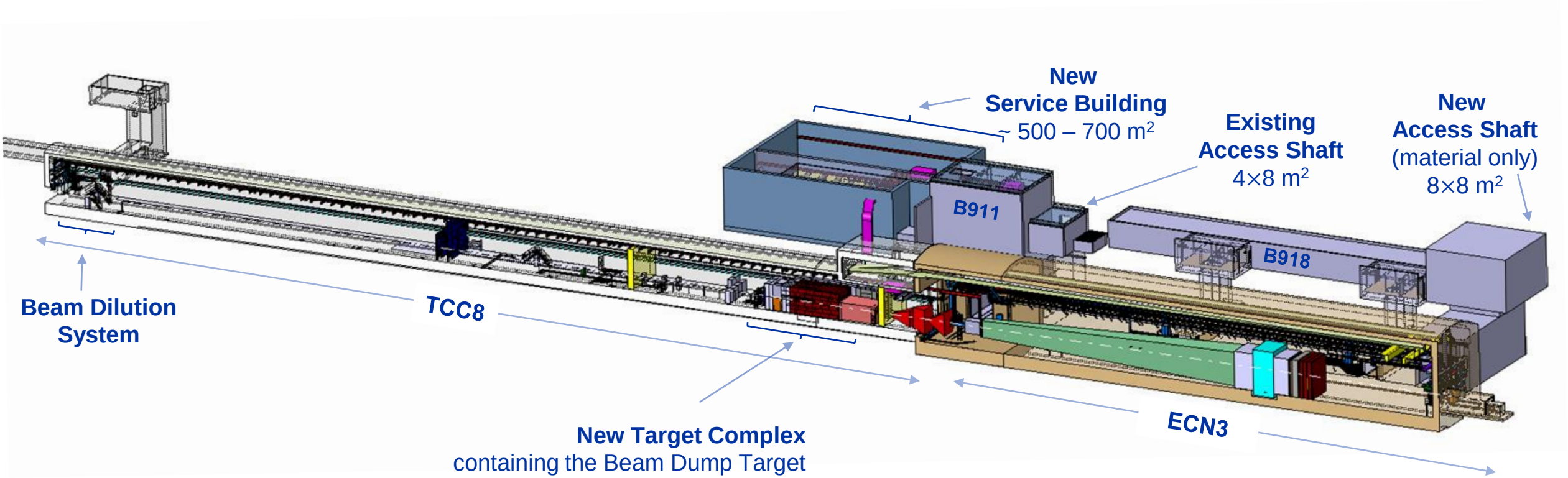
Target Complex in an existing facility

- Implementation in the SPS North Area ECN3 designed at construction in 70’s for a High Intensity (NAHIF)
- Currently used by NA62 experiment
- SPS North Area beam lines and associated infrastructure being currently consolidated
- Would require the dismantling fraction of current beam line, target station, the experiment
- Only one target station can be accommodated in the cavern

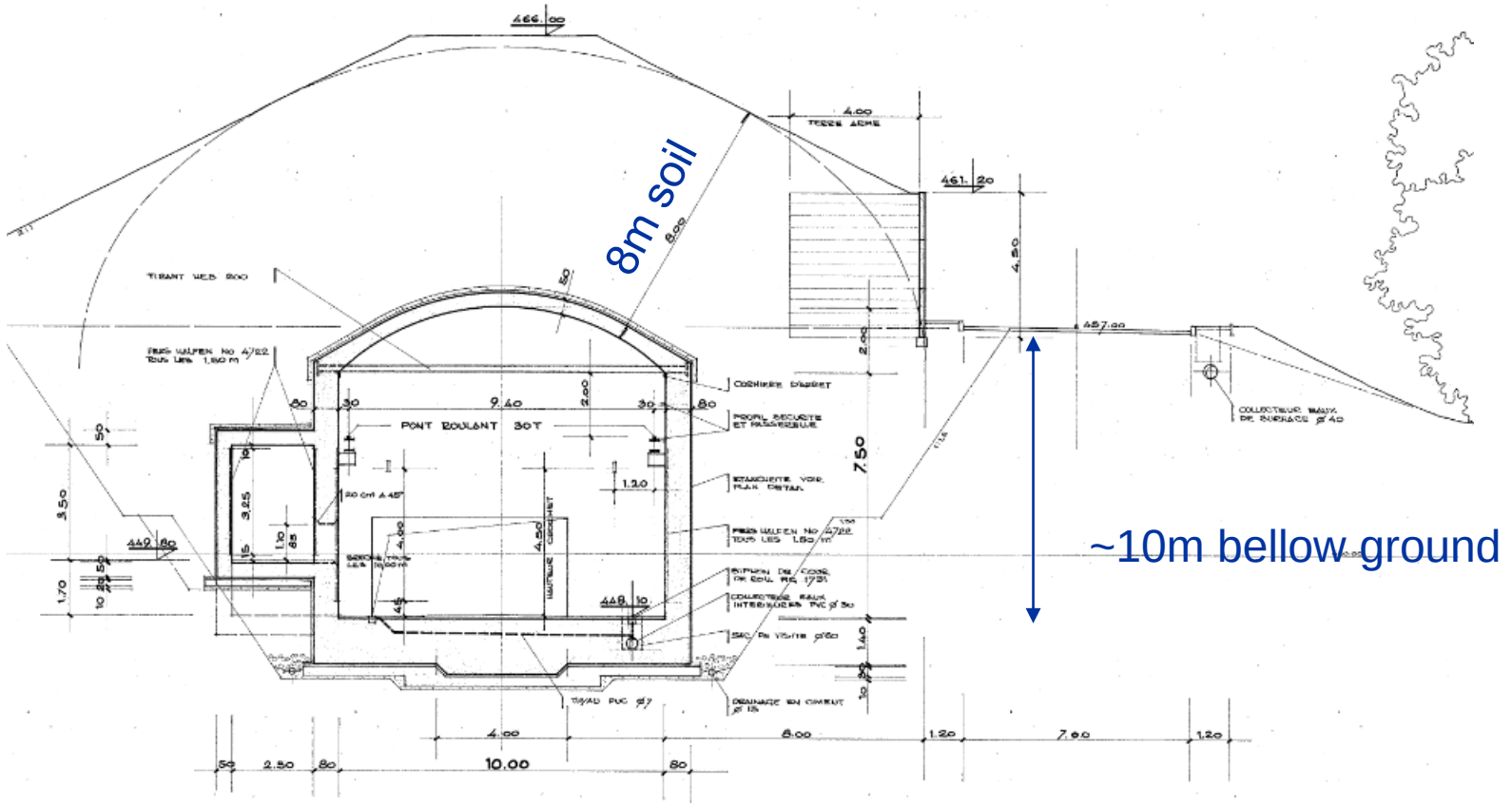




BDF/SHiP Target & Complex

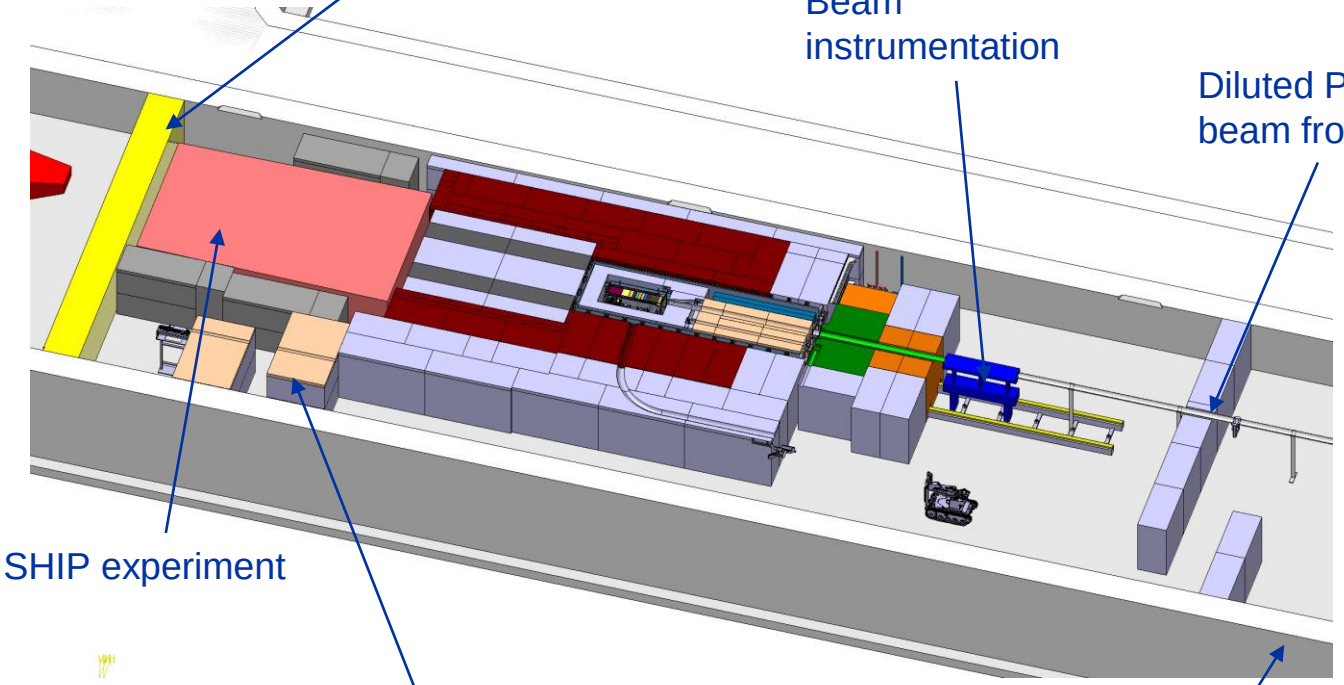


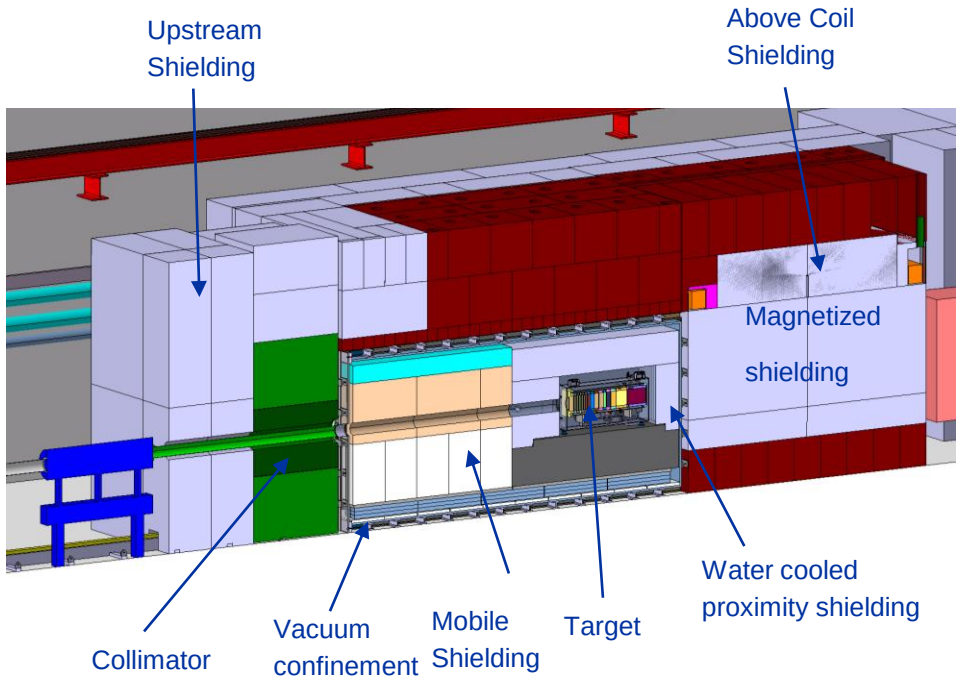
The TCC8 area

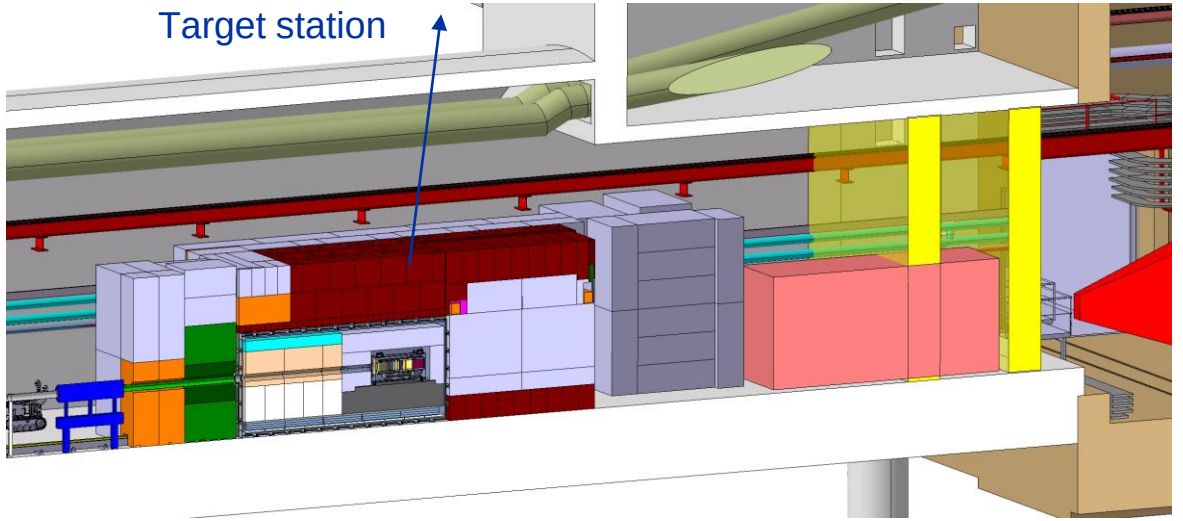


TCC8 cross section (length 170m)

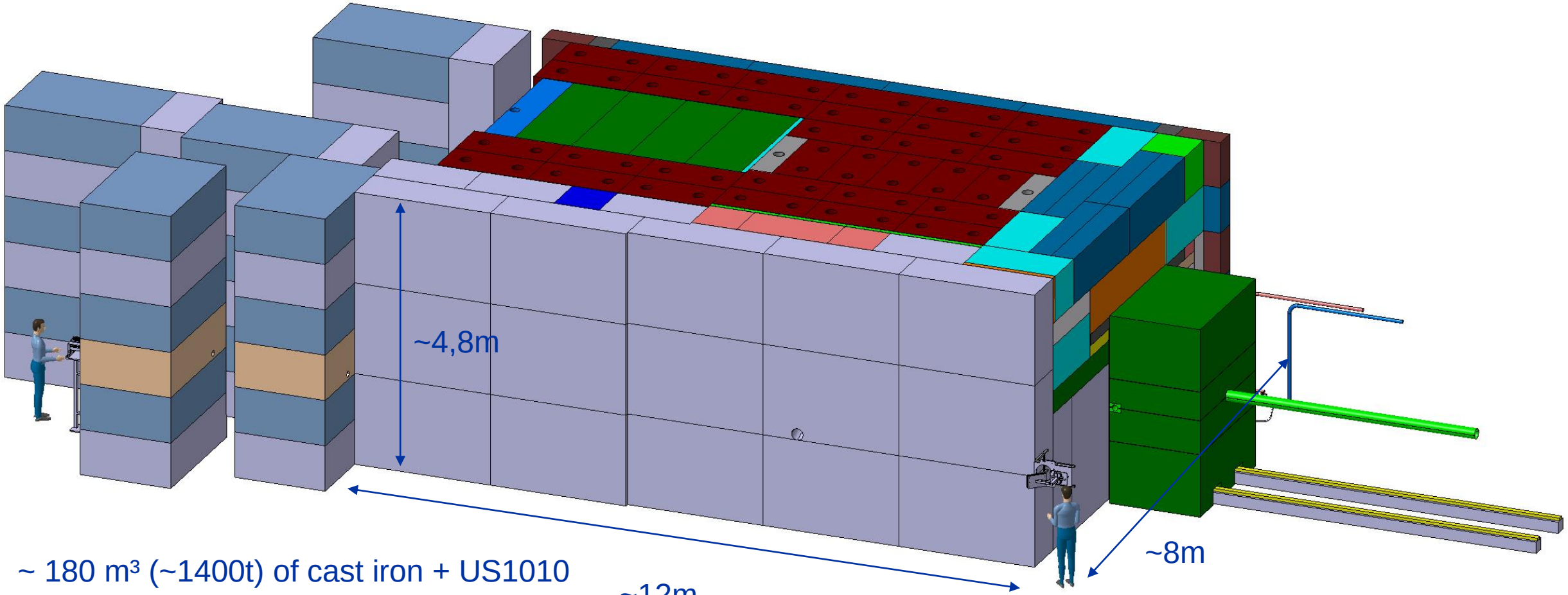
BDF Target complex integration





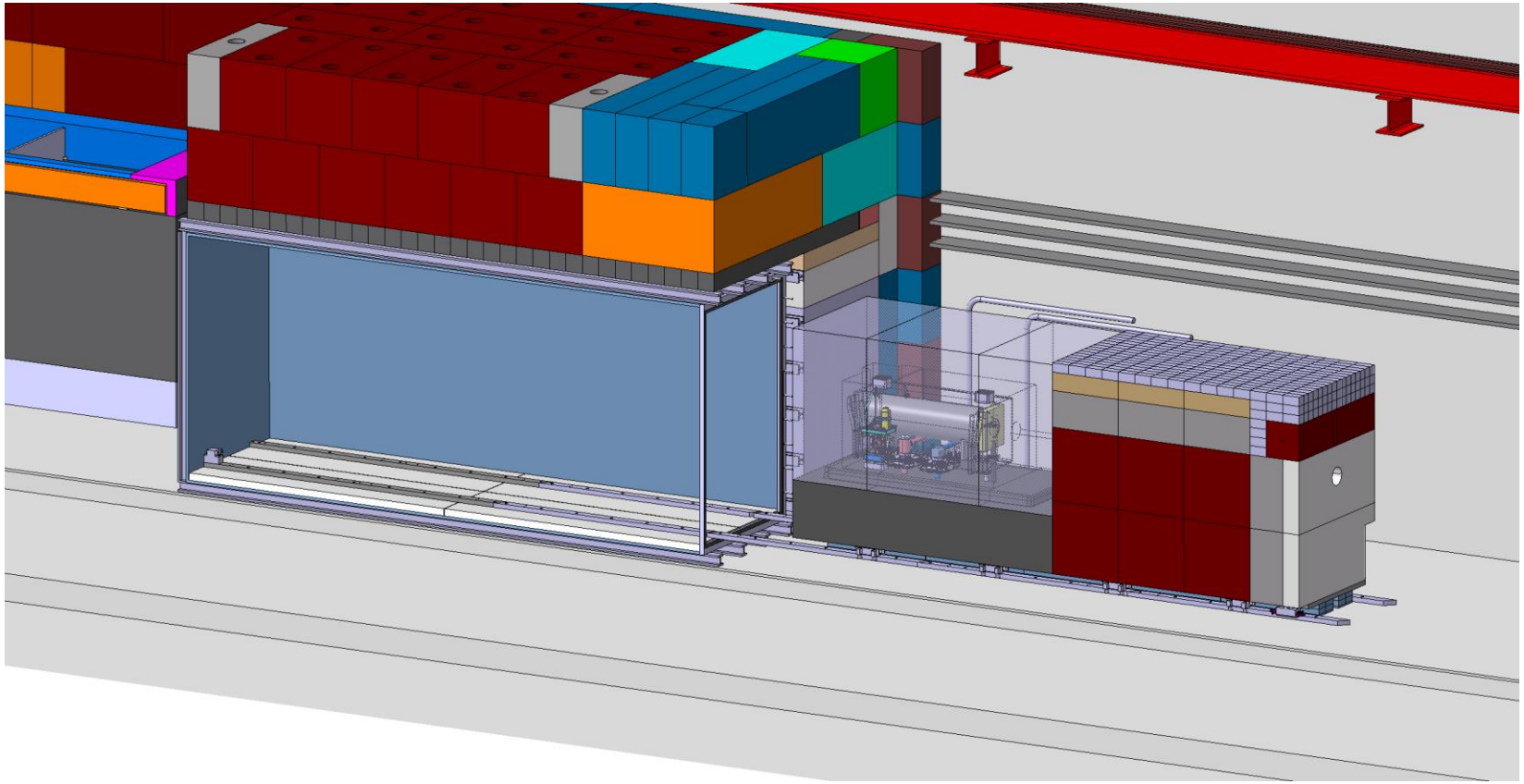


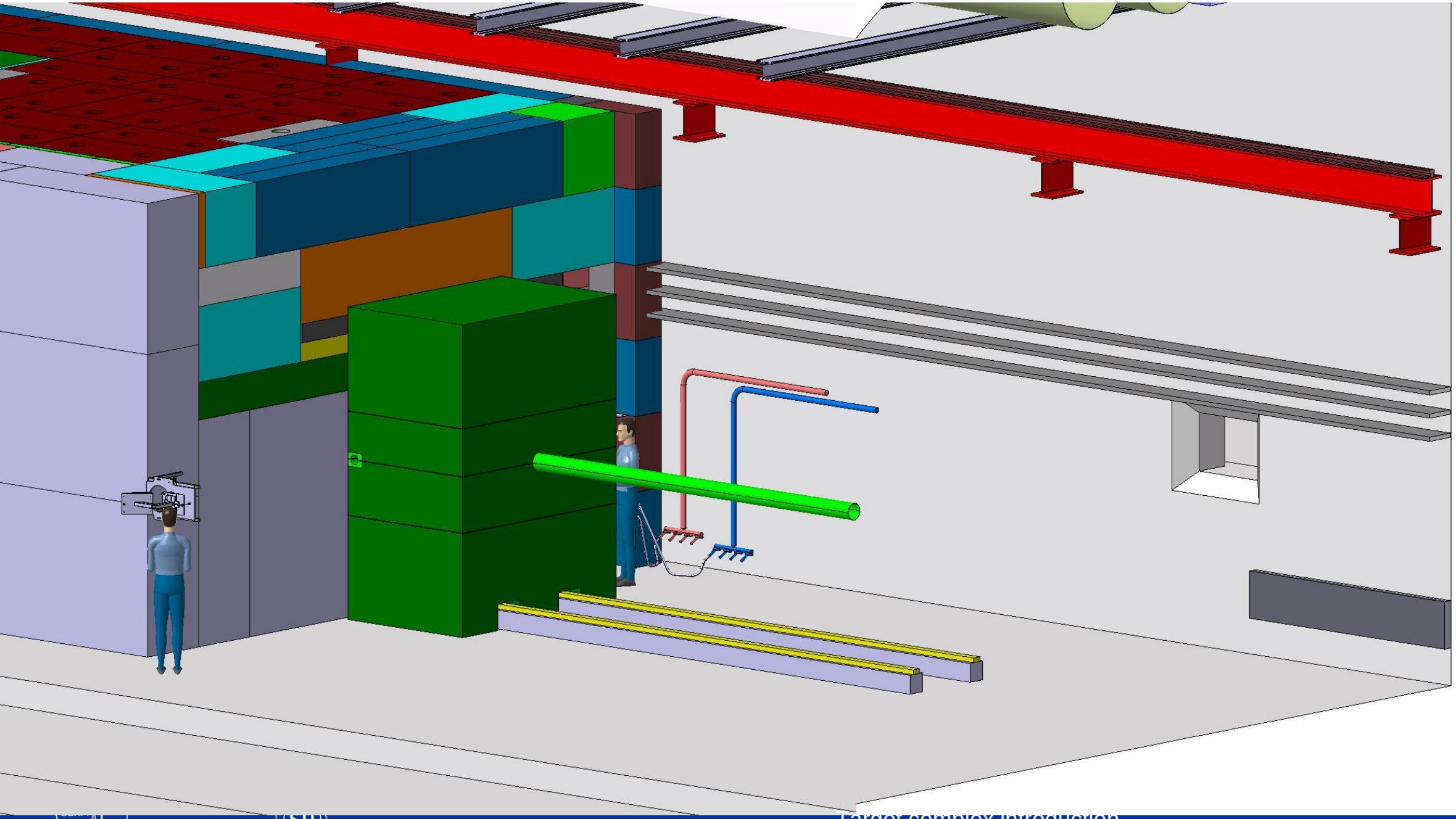
BDF Target complex integration - shielding

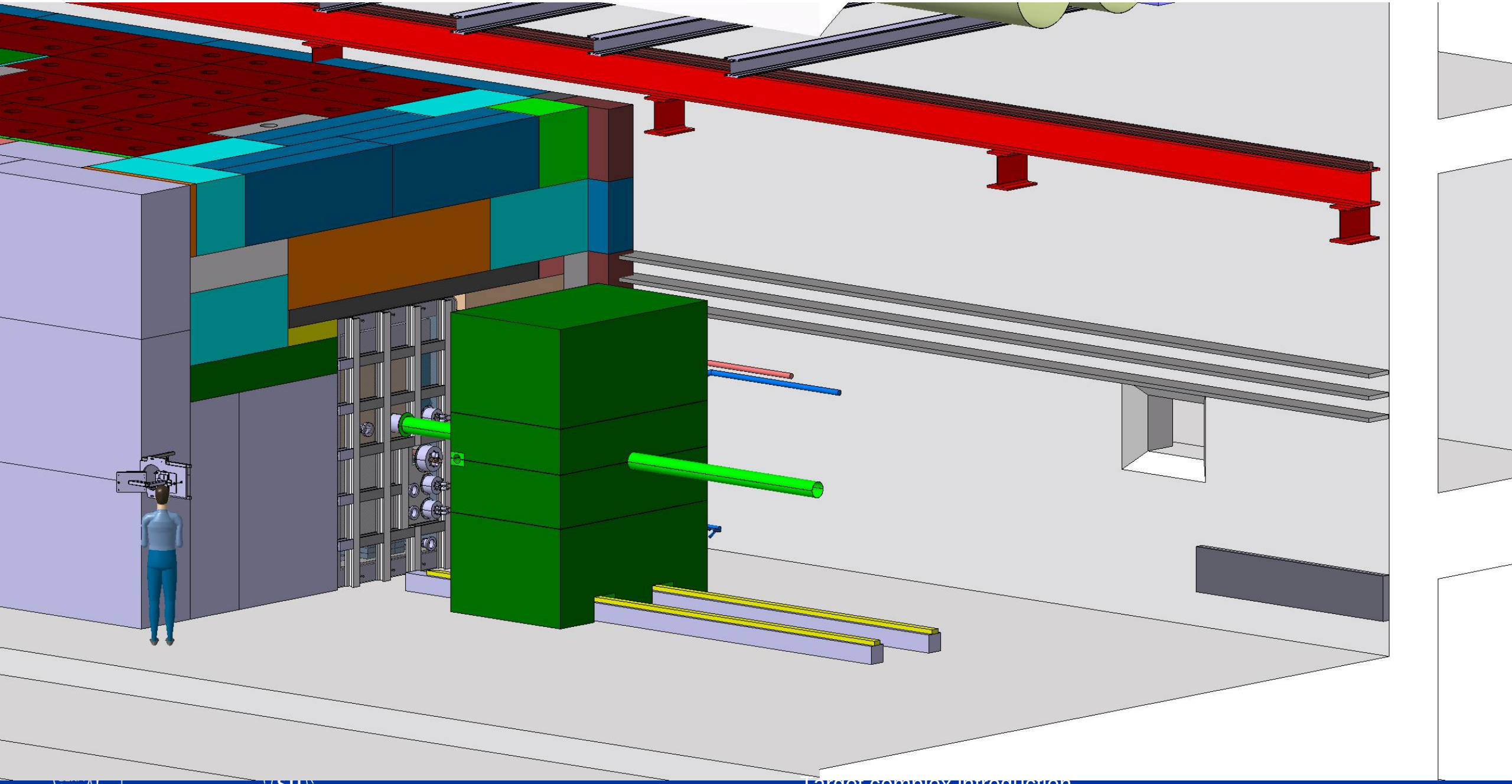


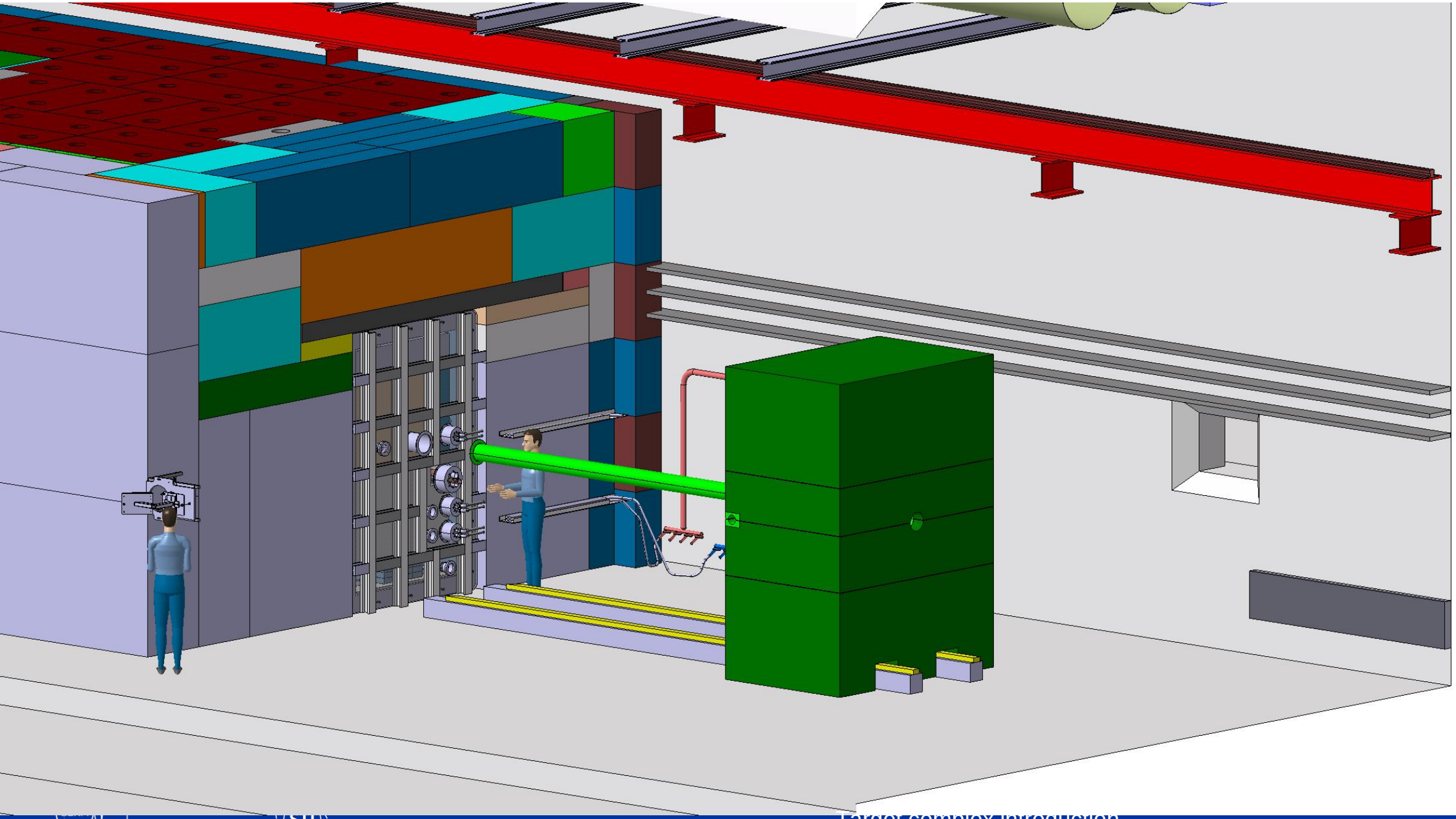
- ~ 180 m³ (~1400t) of cast iron + US1010
- ~ 360 m³ (~800t) of concrete / marble

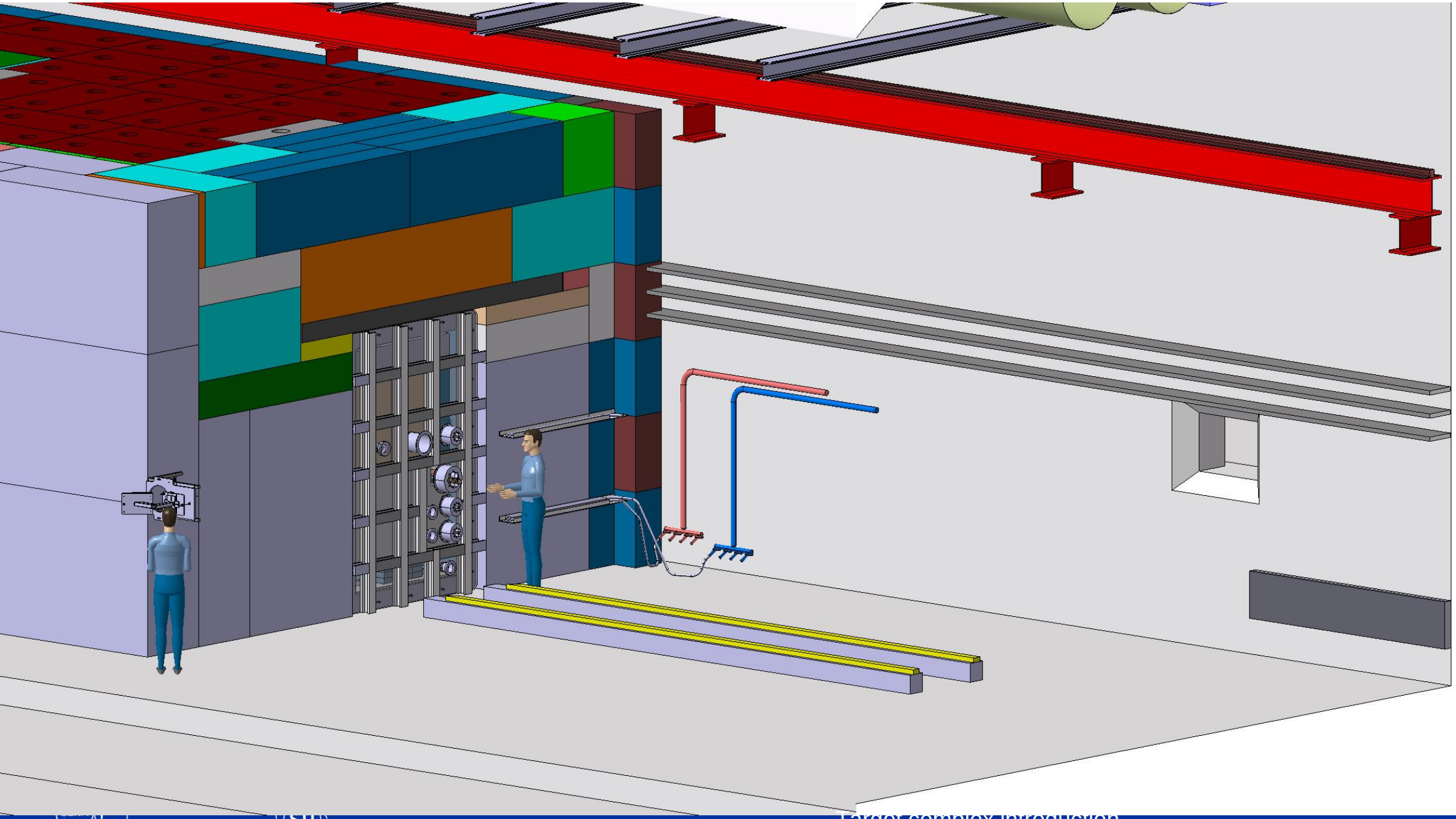
BDF Target complex integration extraction

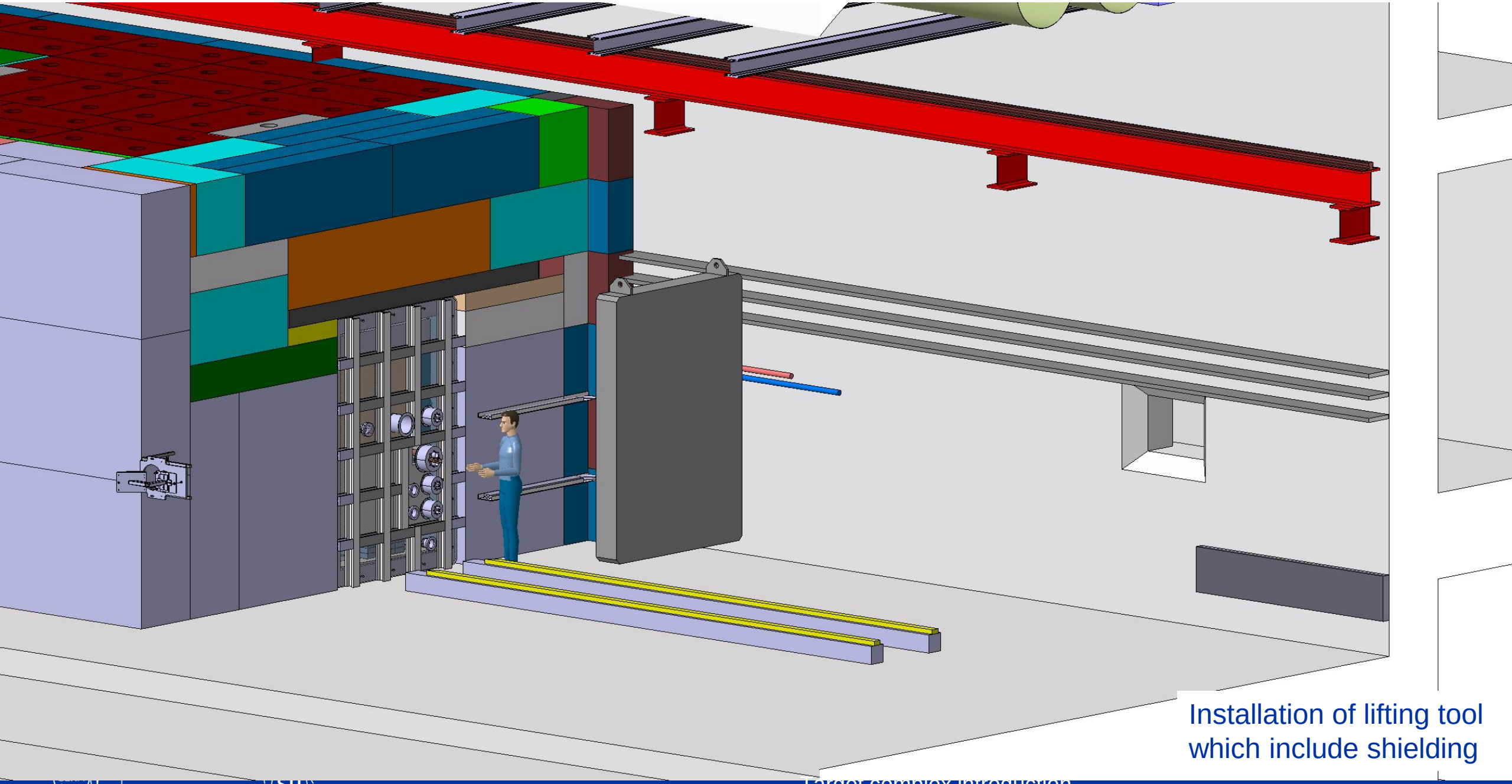




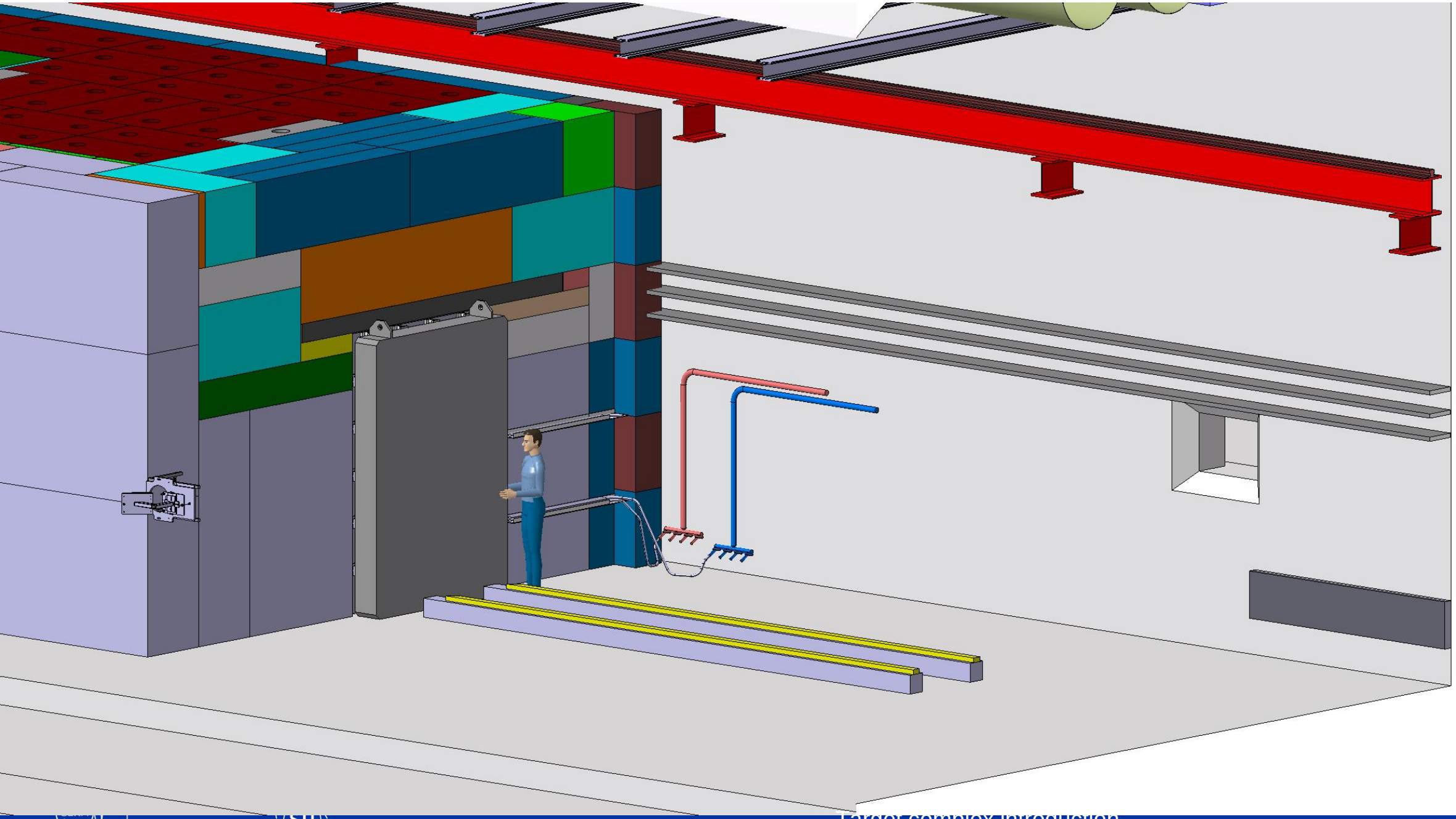


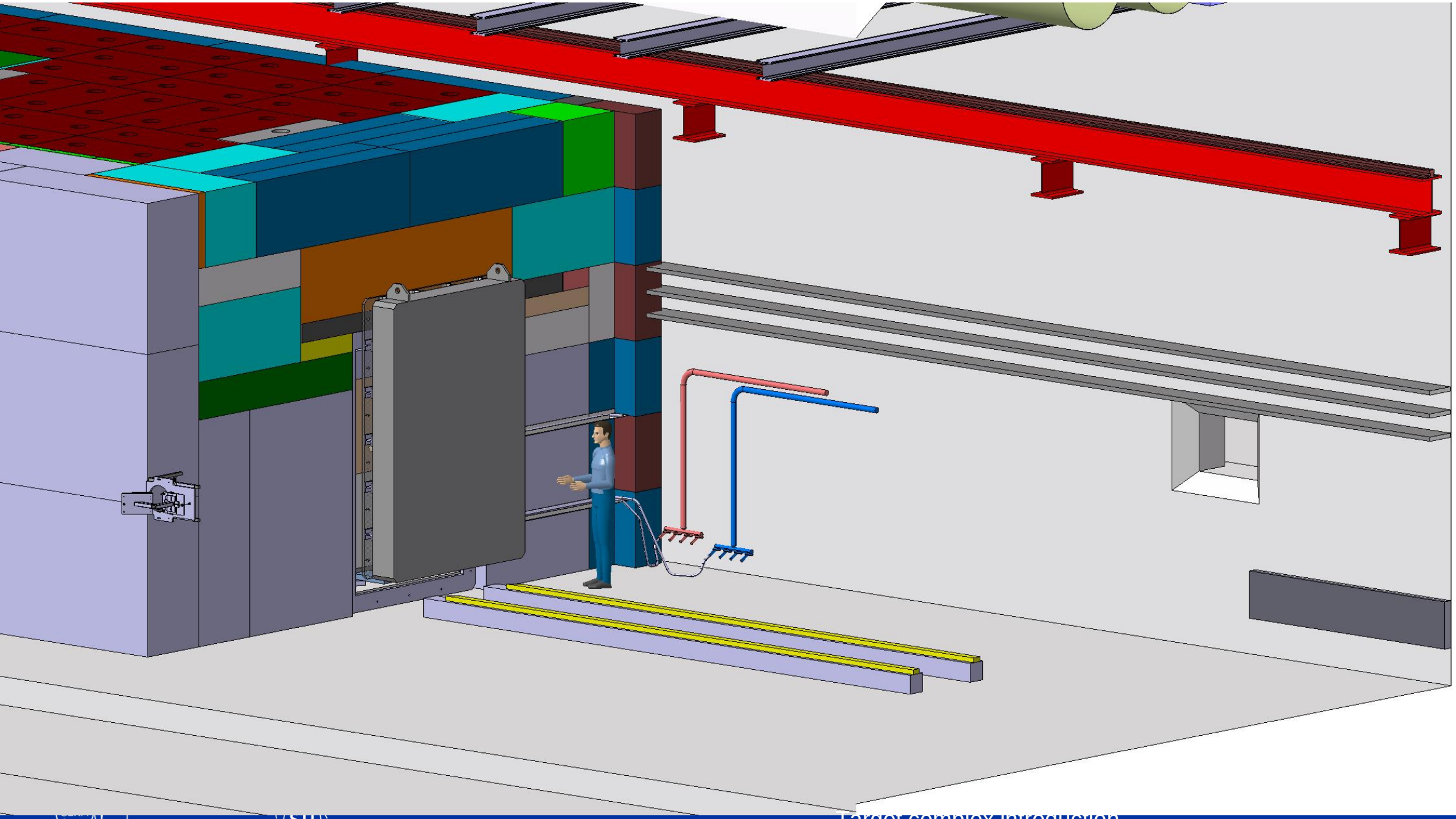


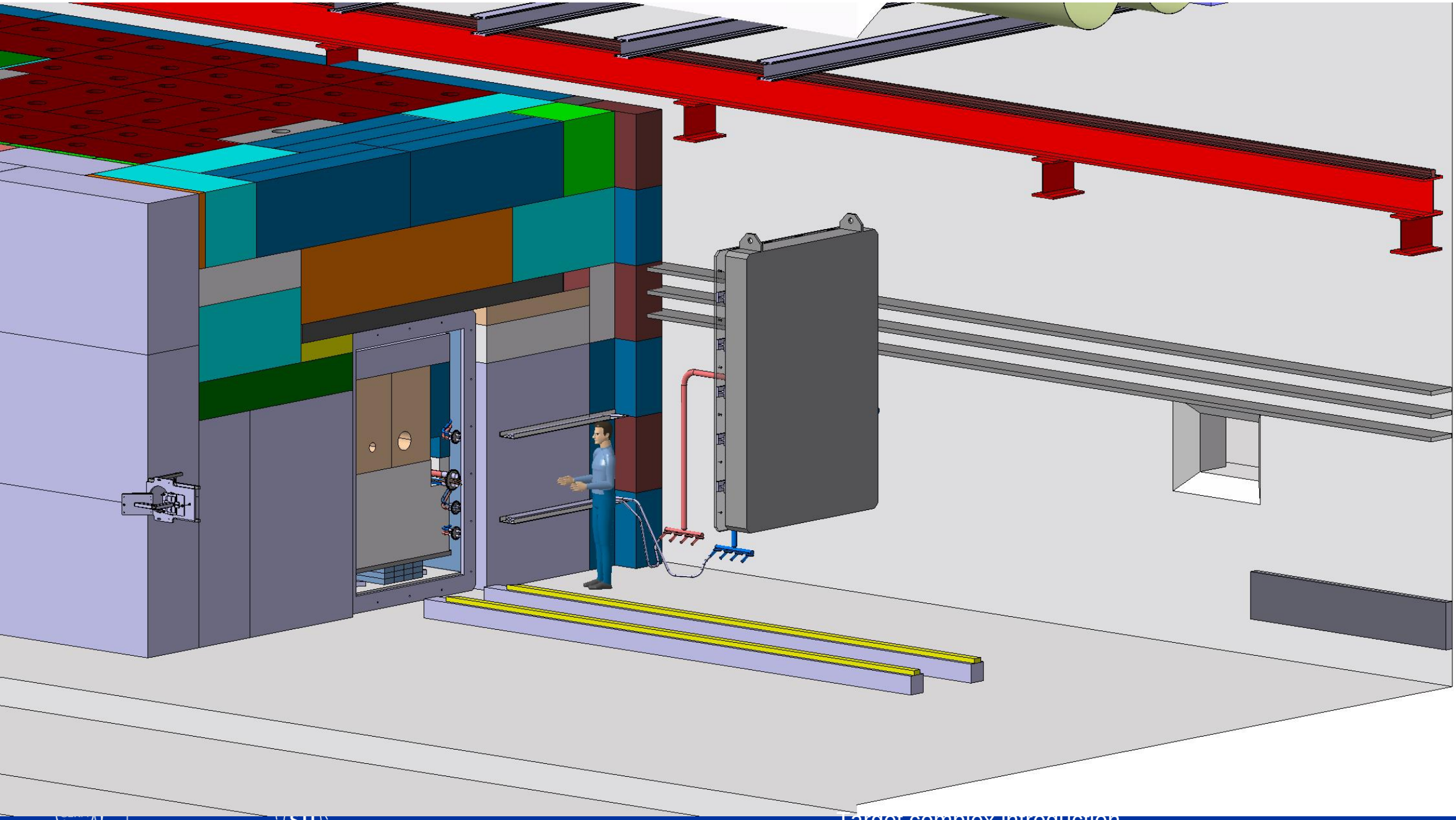


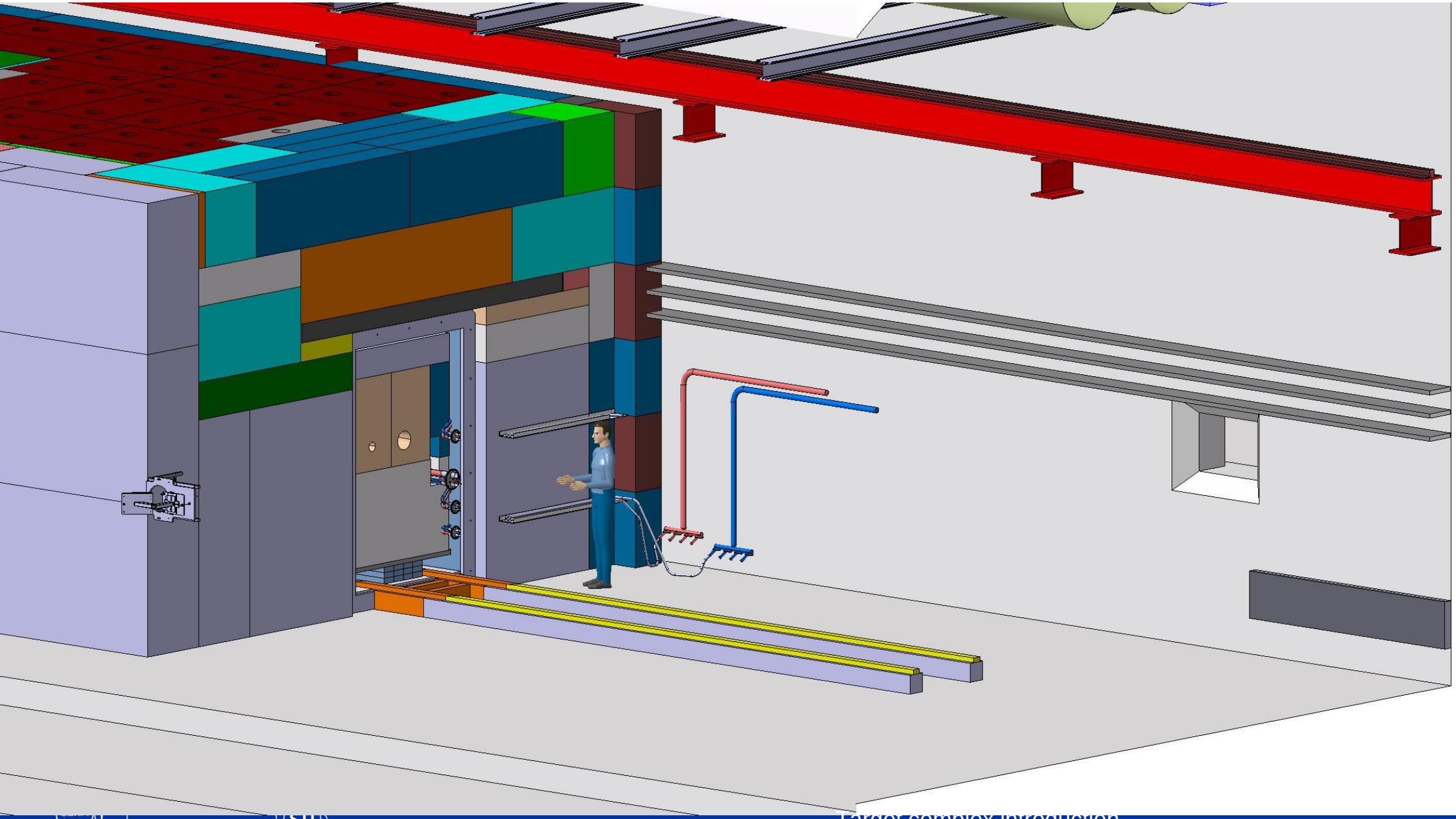


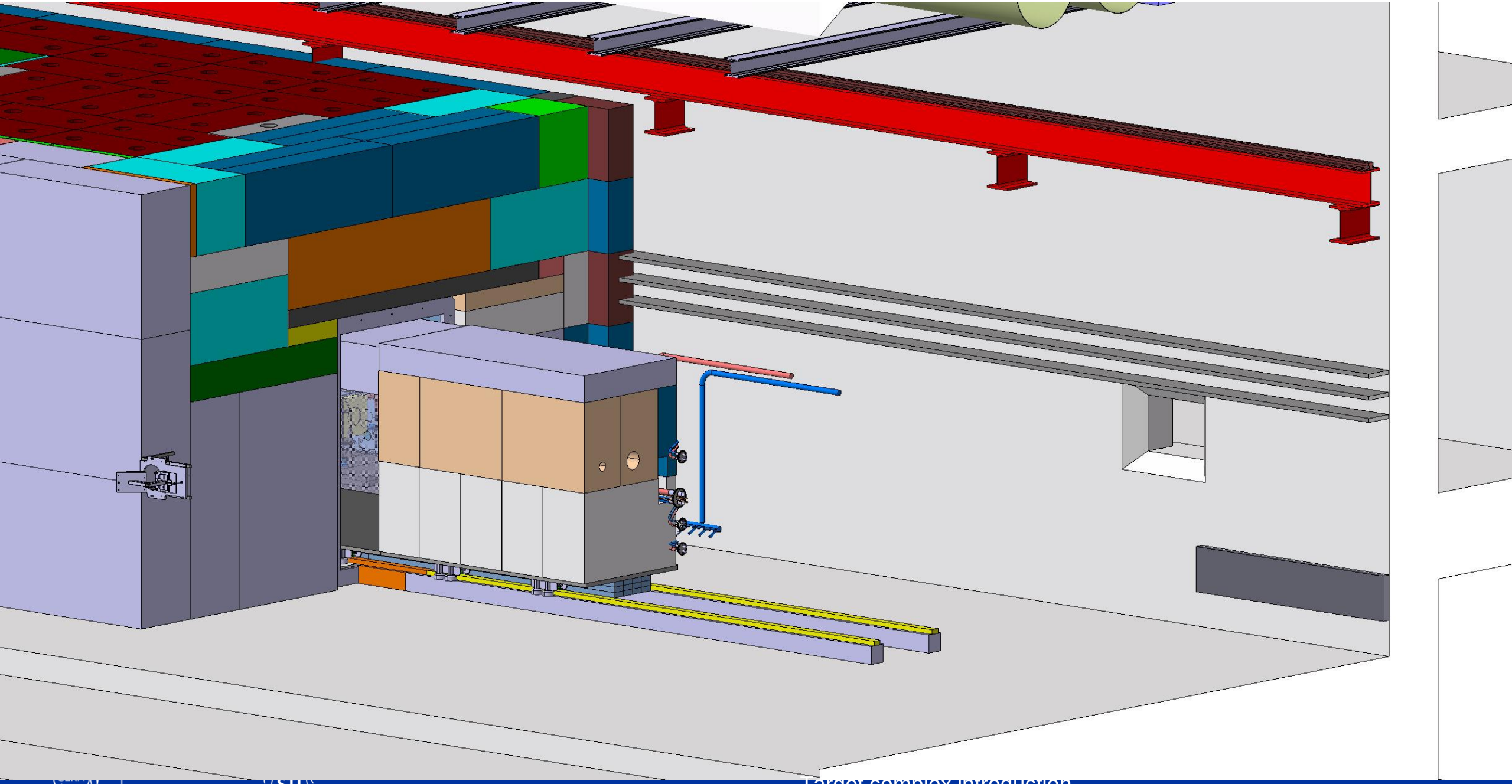
Installation of lifting tool which include shielding

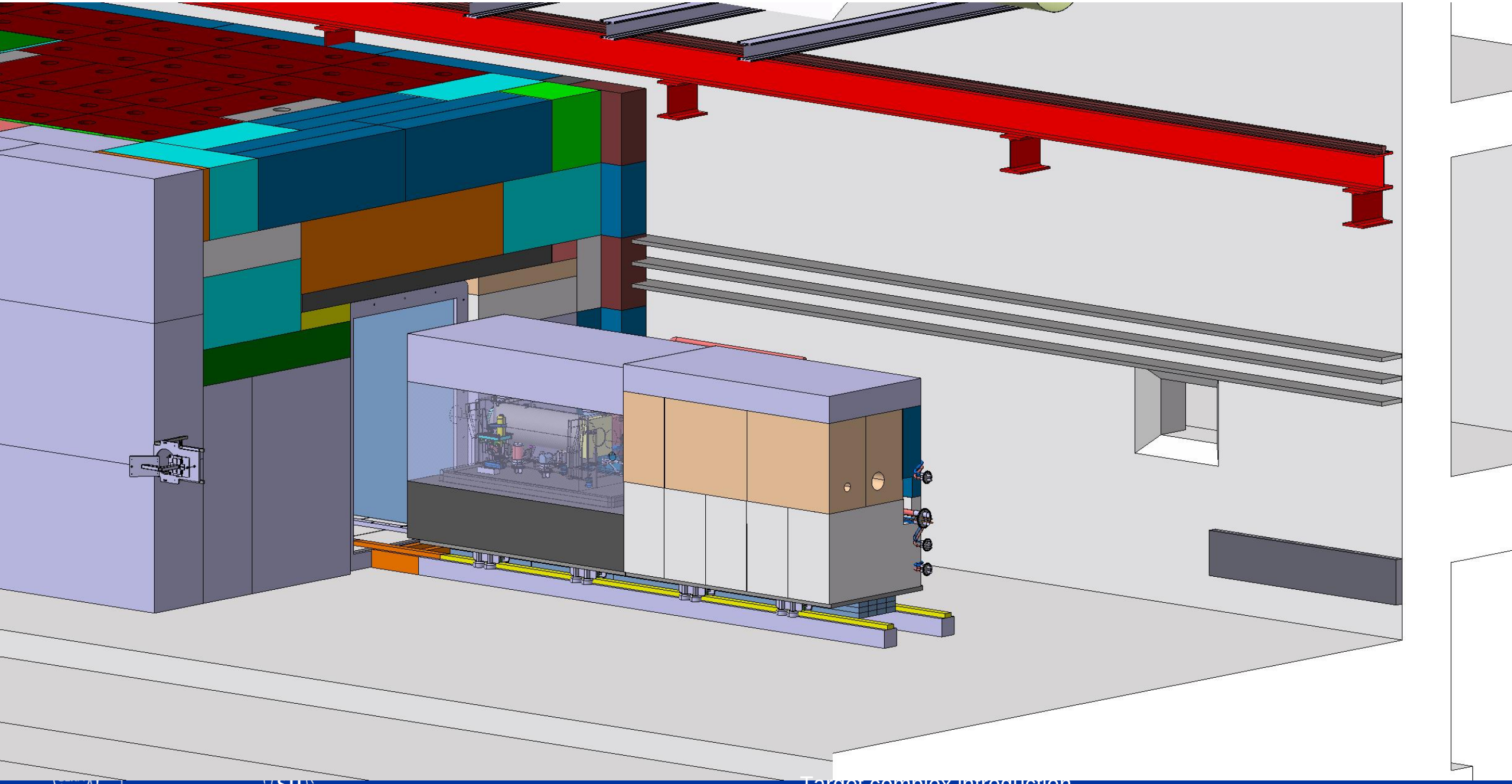


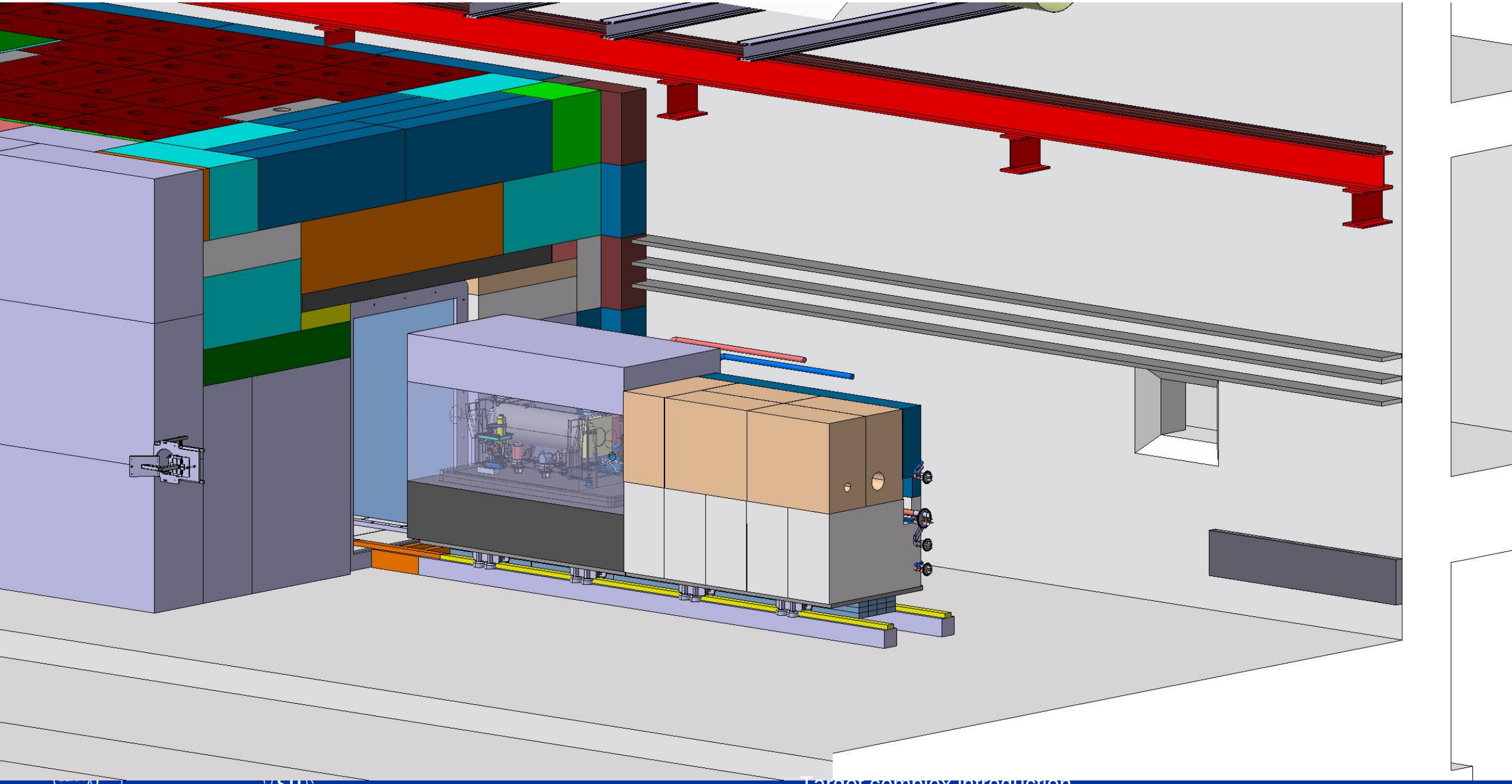


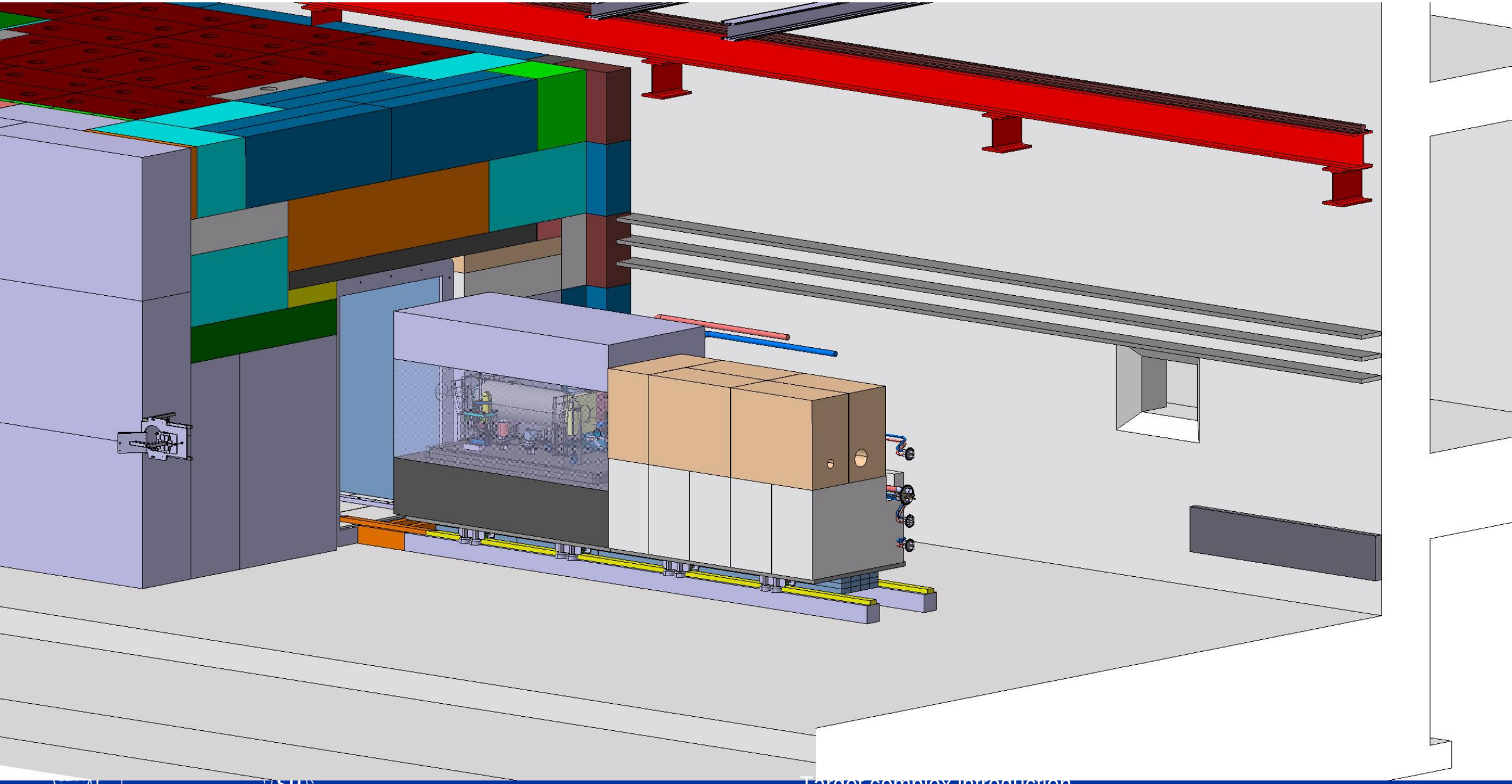


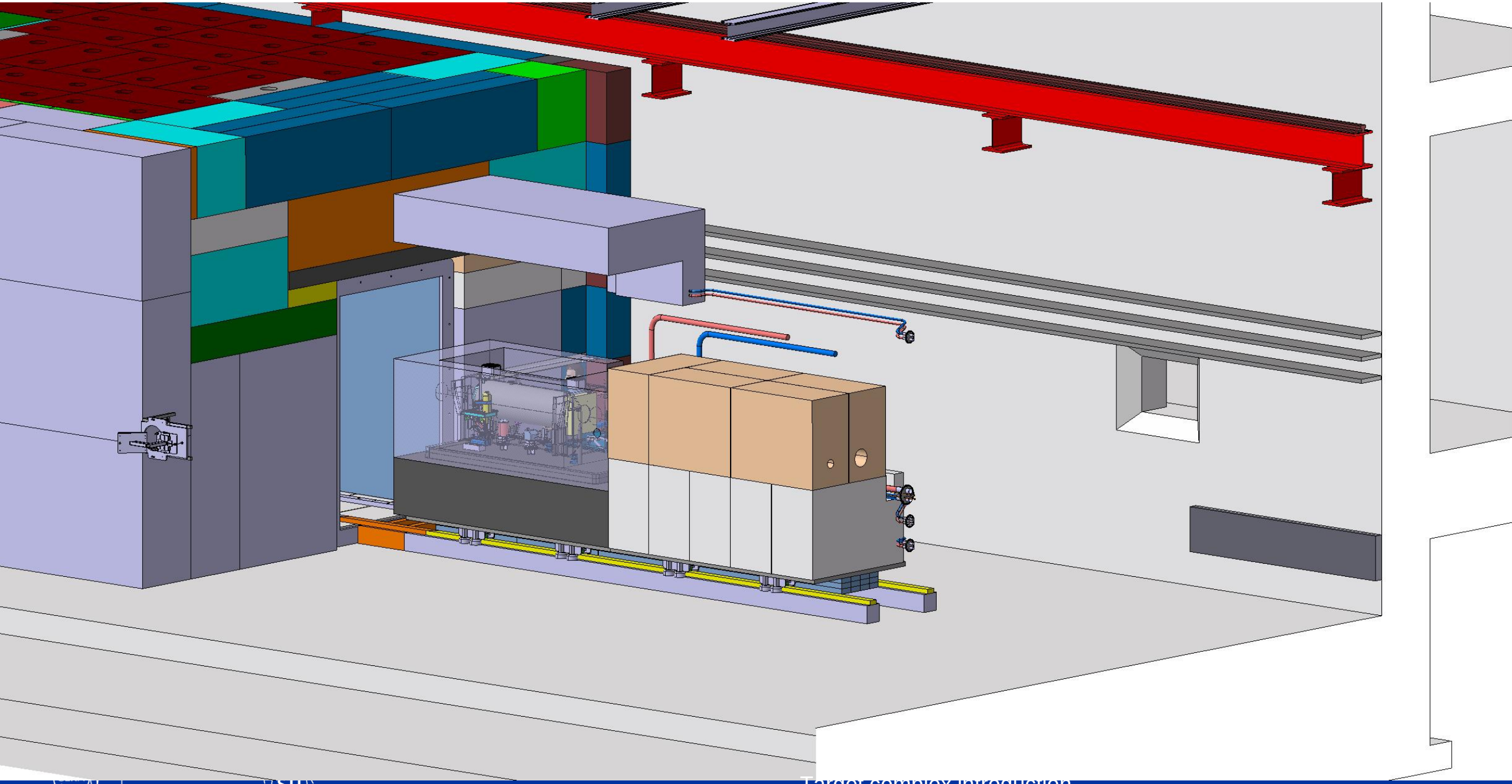


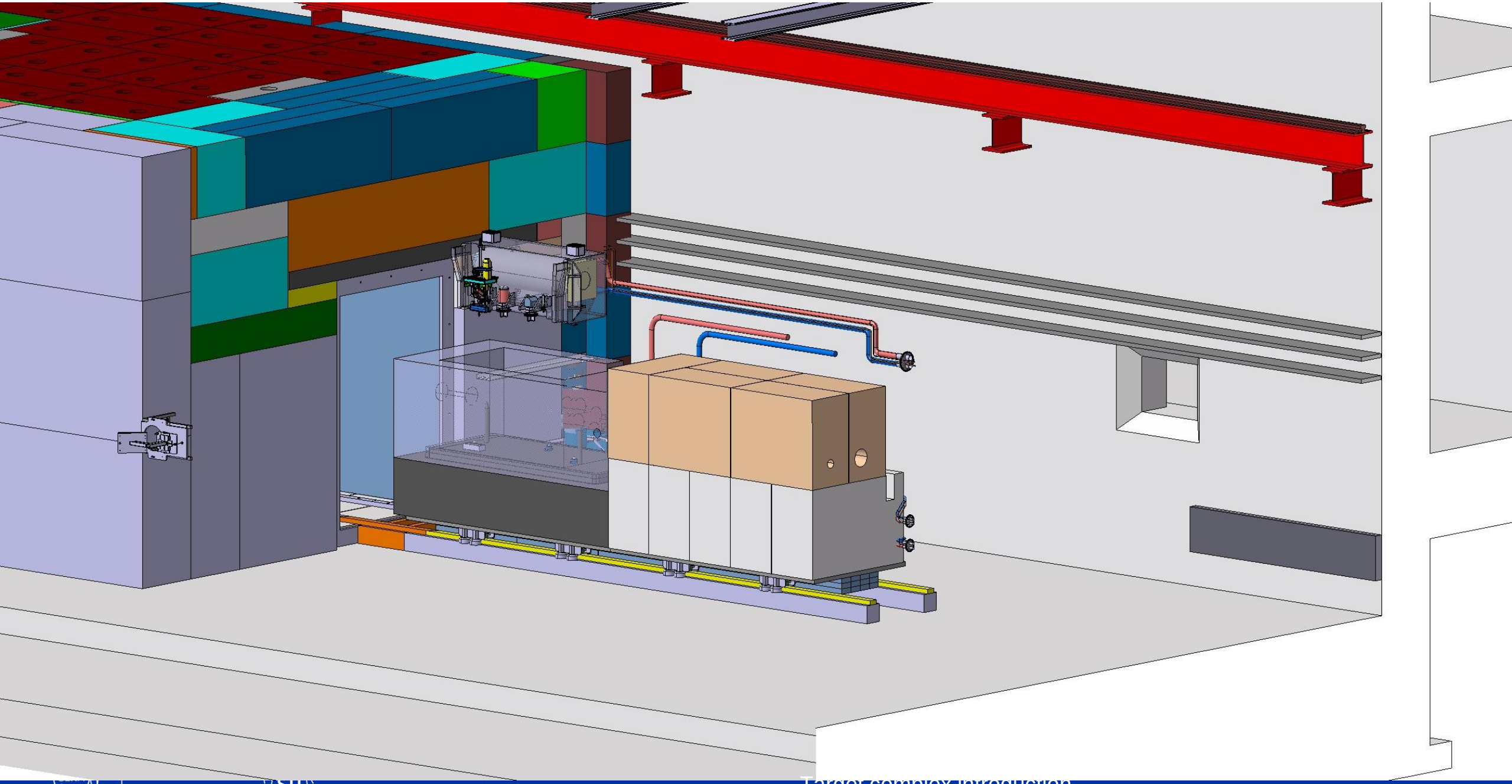




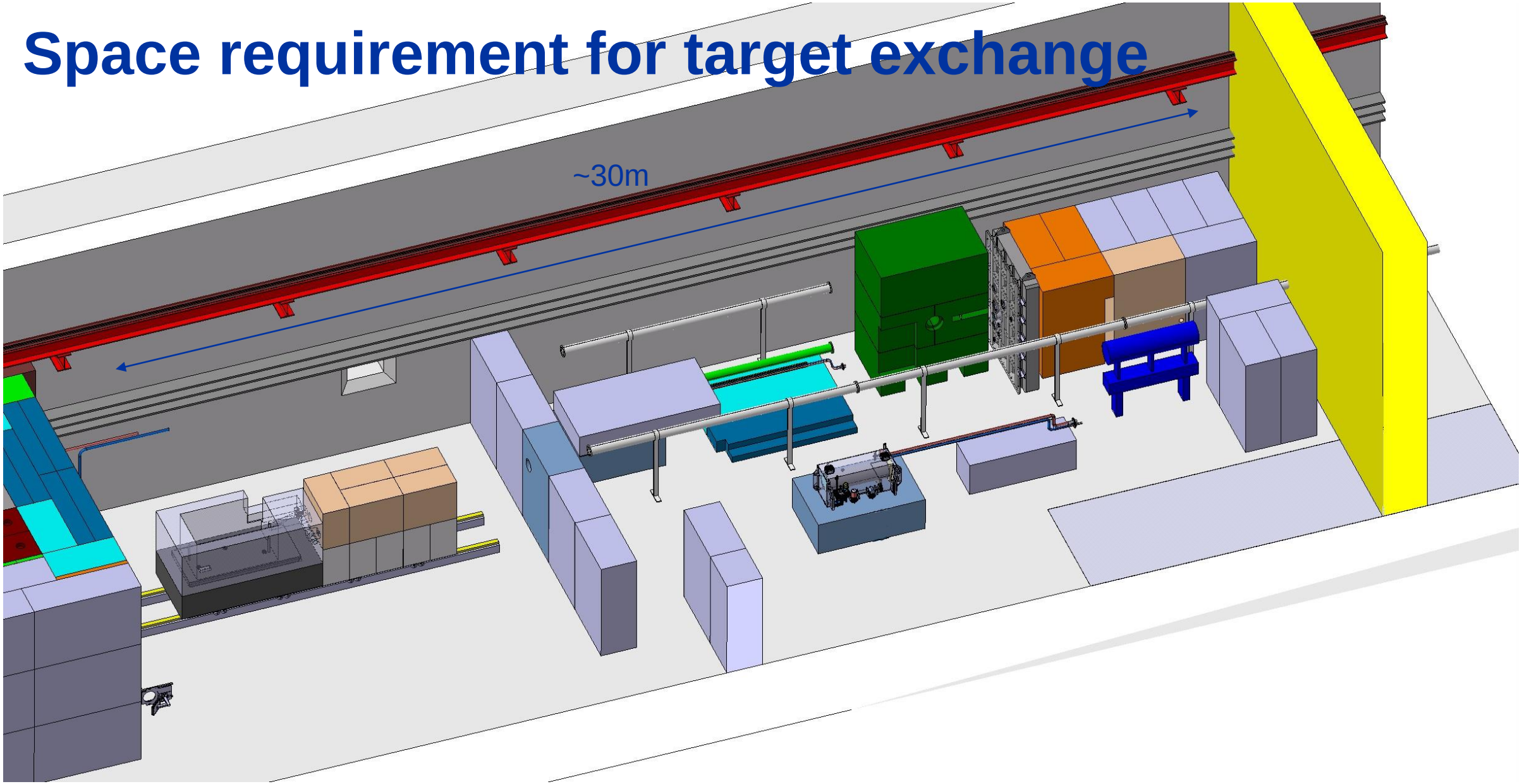




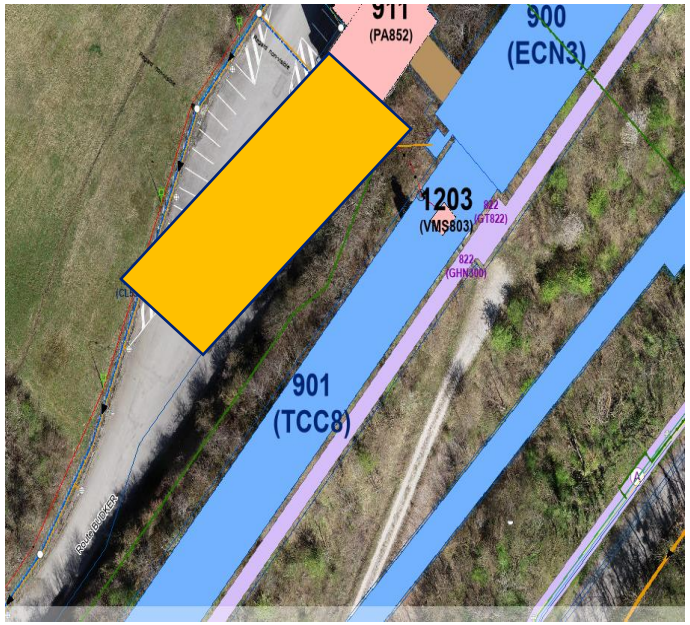




Space requirement for target exchange



The target service building



Nuclear ventilation system of the target complex

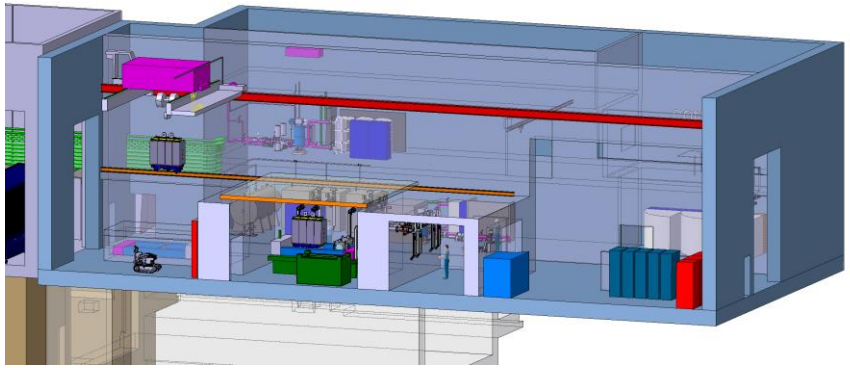
- Air handling units, filters, dehumidifiers (outside)

Target cooling systems

- Pumps, Filters, Heat exchanger, Cooling instrumentation, He circulation system (target primary confinement)

Target controls systems

- Target monitoring (sensors), Target control valves, vacuum vessel confinement



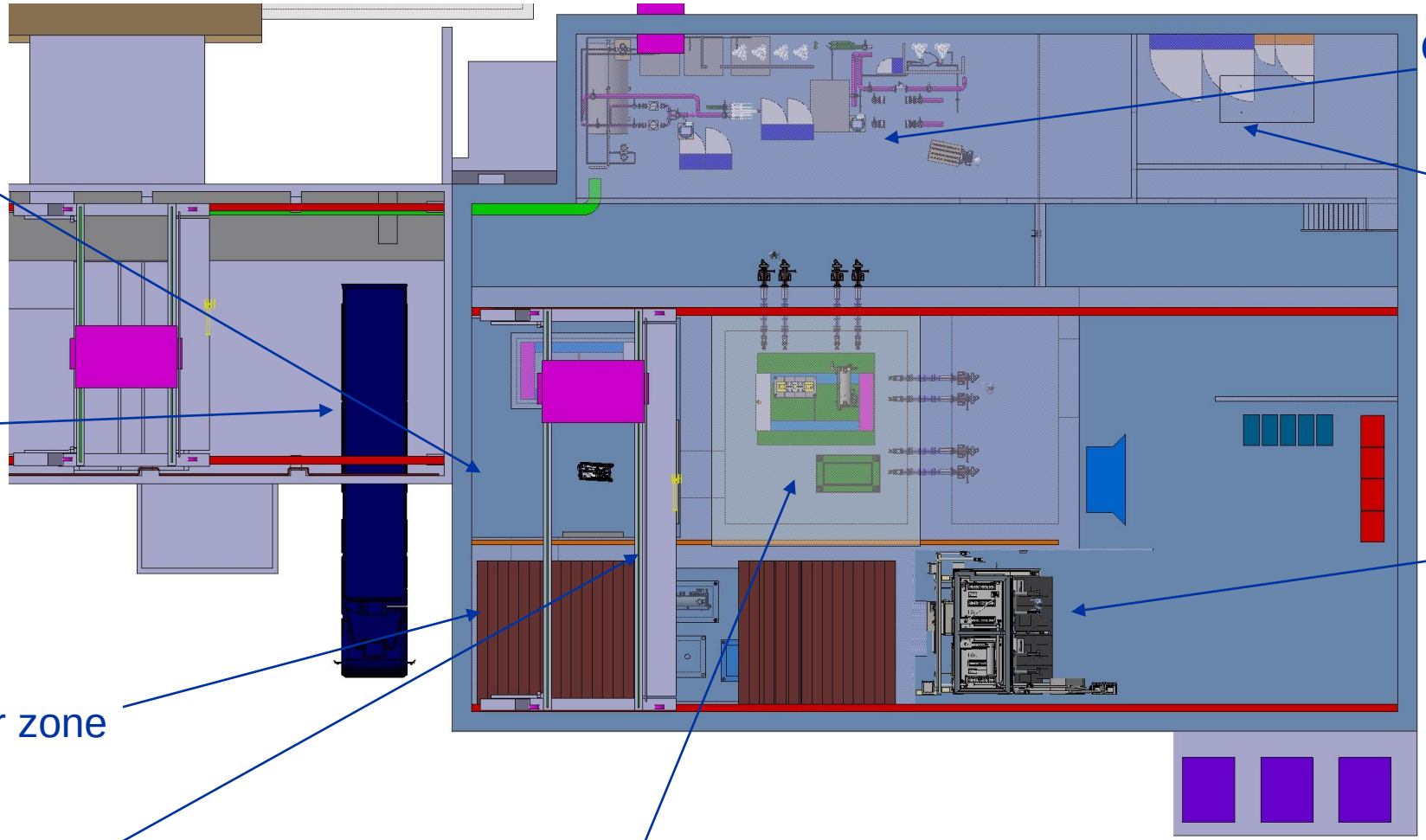
Service cell

Evaporator

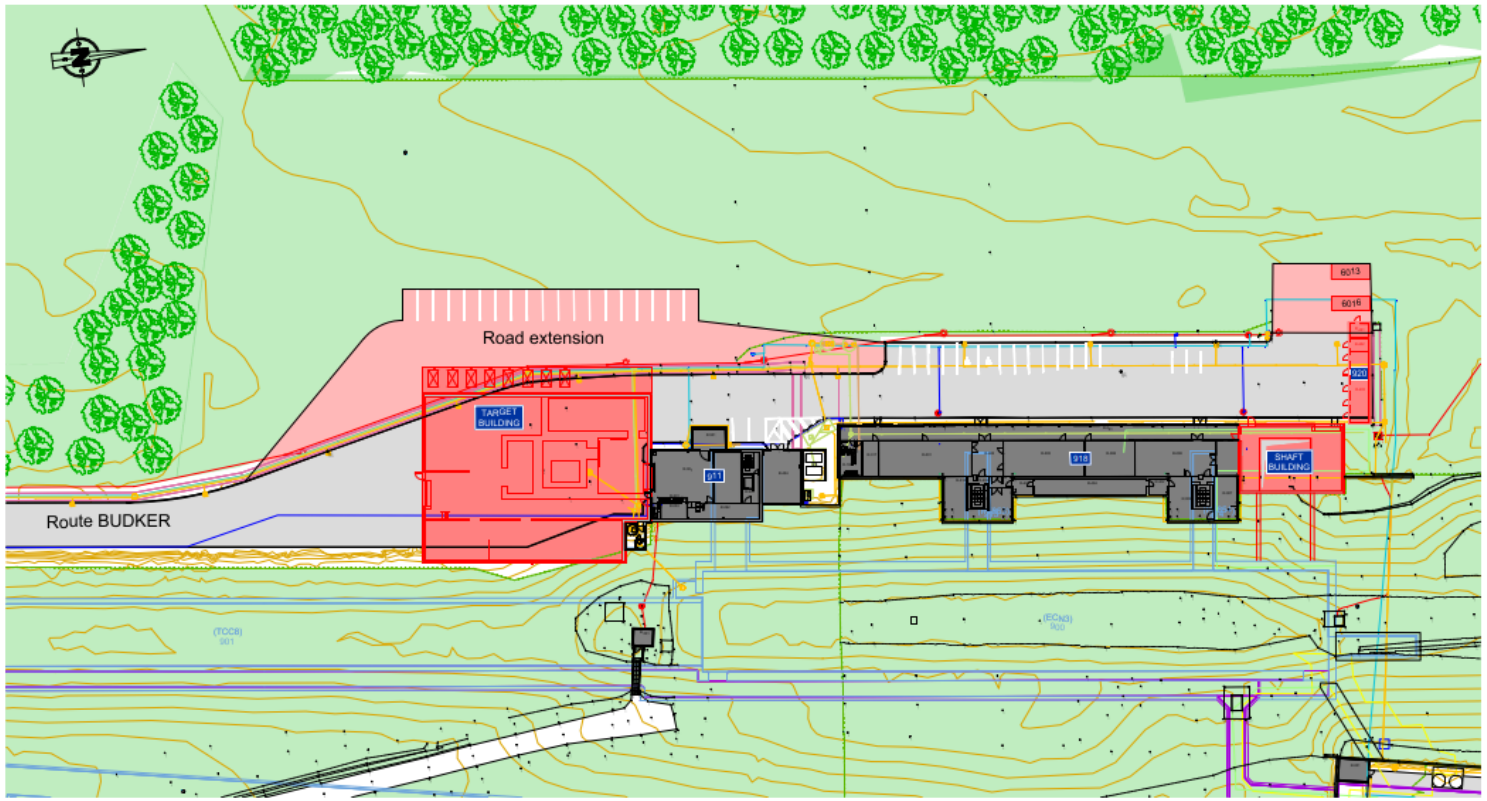
Electrical distribution system

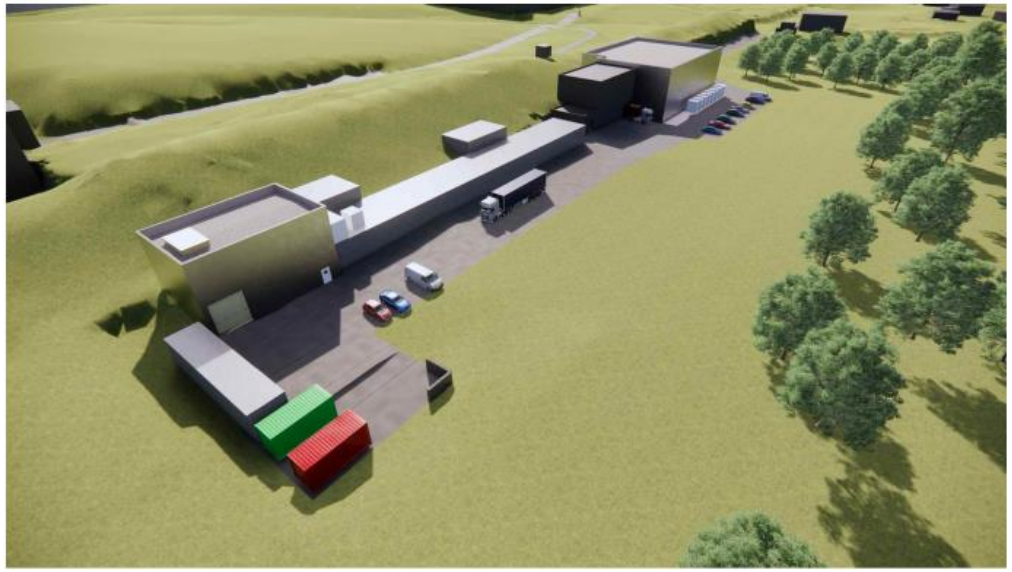
~700m²

Service building

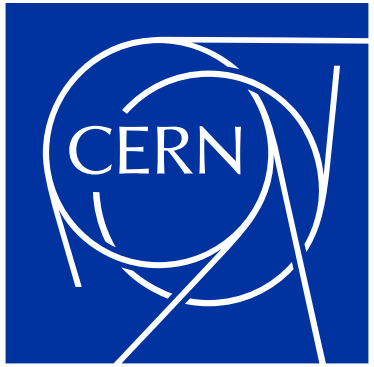


Service building within the BDF/SHiP complex





Description of subsystems described in the next talks



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