



DarkSide 20k – External Cryostat Assembly

TDR RC Meeting

25-25 June 2024

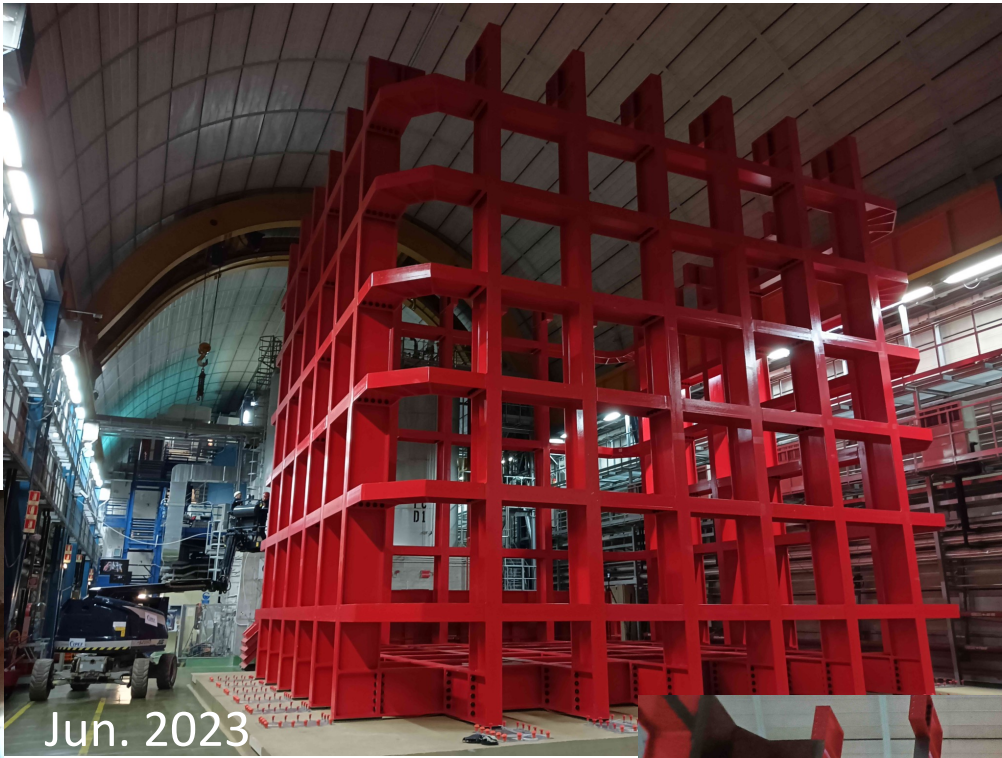
Andrea Zani, INFN Milano, on behalf of PCD

Cryostat construction (summary)

- Concrete base: poured in late 2022, resin layer in Jan. 2023
- Beam structure (load-bearing): 4 weeks construction in May 2023
- External membrane: installation & welding, Jun-Oct 2023
- “Cold part”: insulation & internal membrane: Nov 2023 – Jun 2024
- Top caps: roof is divided in 5 pieces, that are separately produced, in all their components.
 - Shipped to LNGS in May-June 2024;
 - Test installed, to be removed in a few months. Storage solution under definition.
 - Central top cap arrived on the night of Wed 12.
 - Cryogenics top cap welded, will remain in place throughout installation



Cryostat construction



Jun. 2023



Jun. 2023



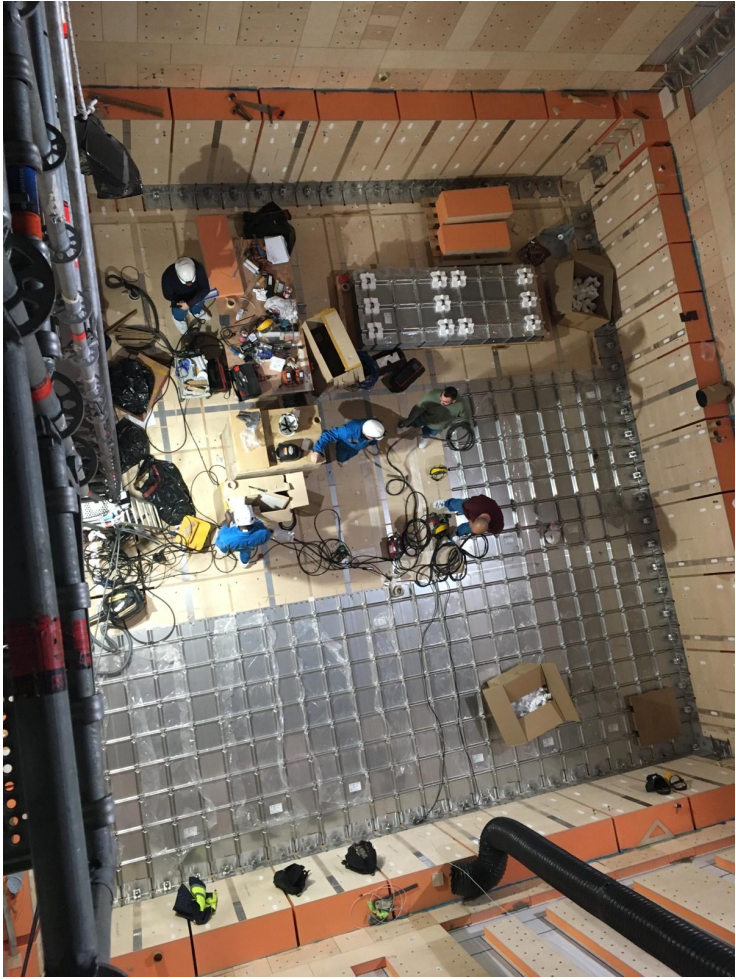
Jul. 2023

Cryostat construction – new pics



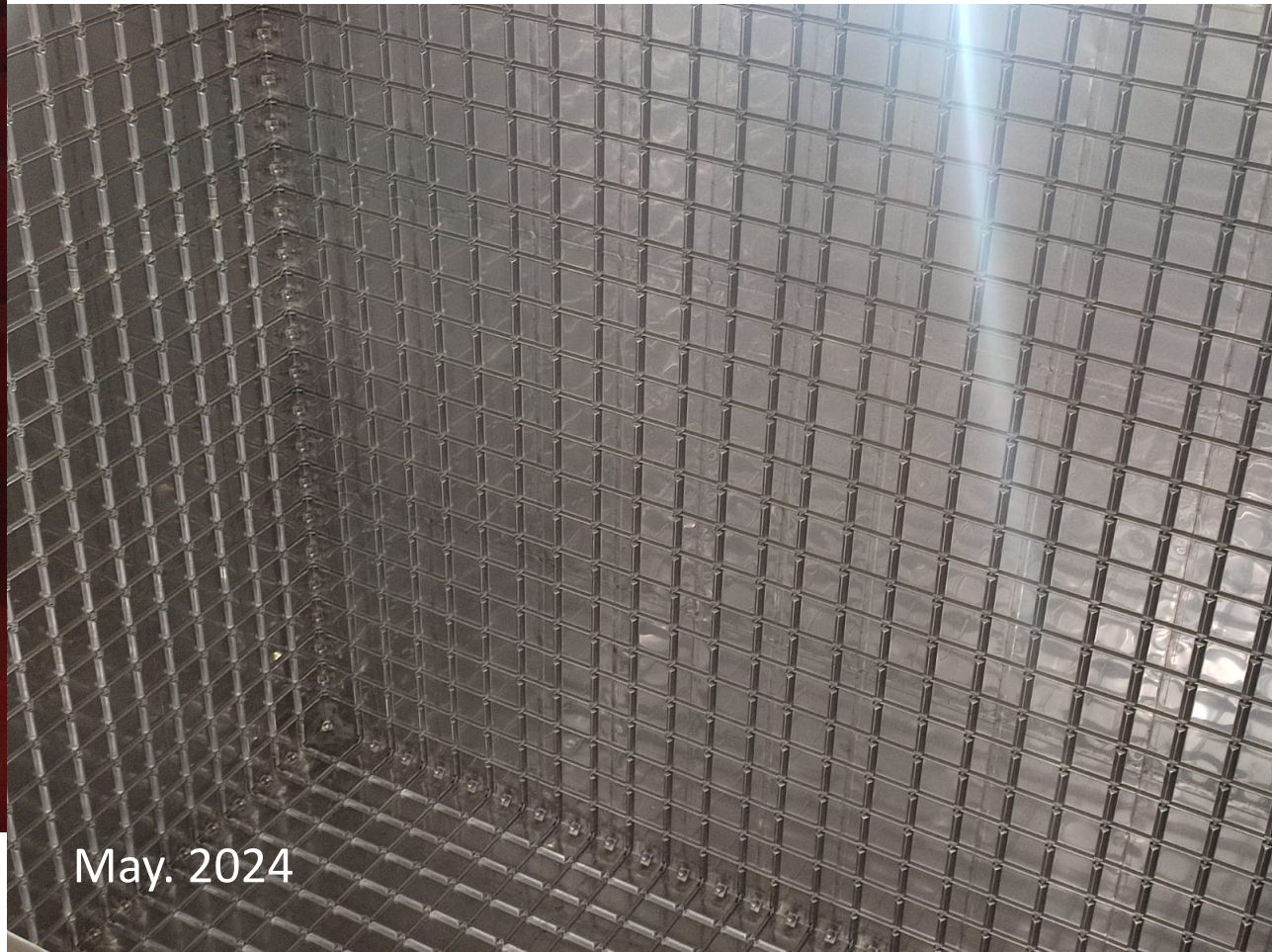
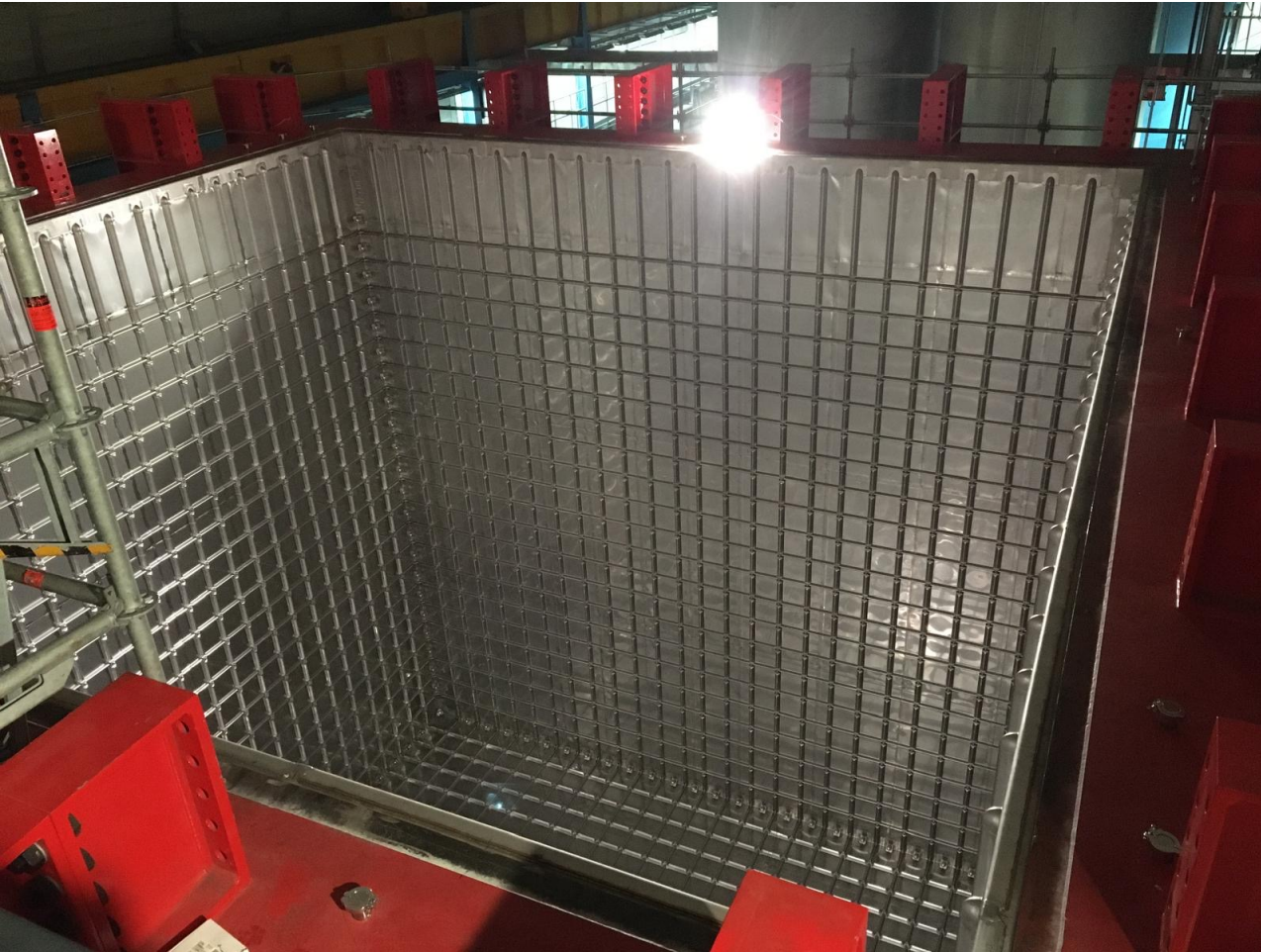
Cryostat construction – new pics

Feb. 2024



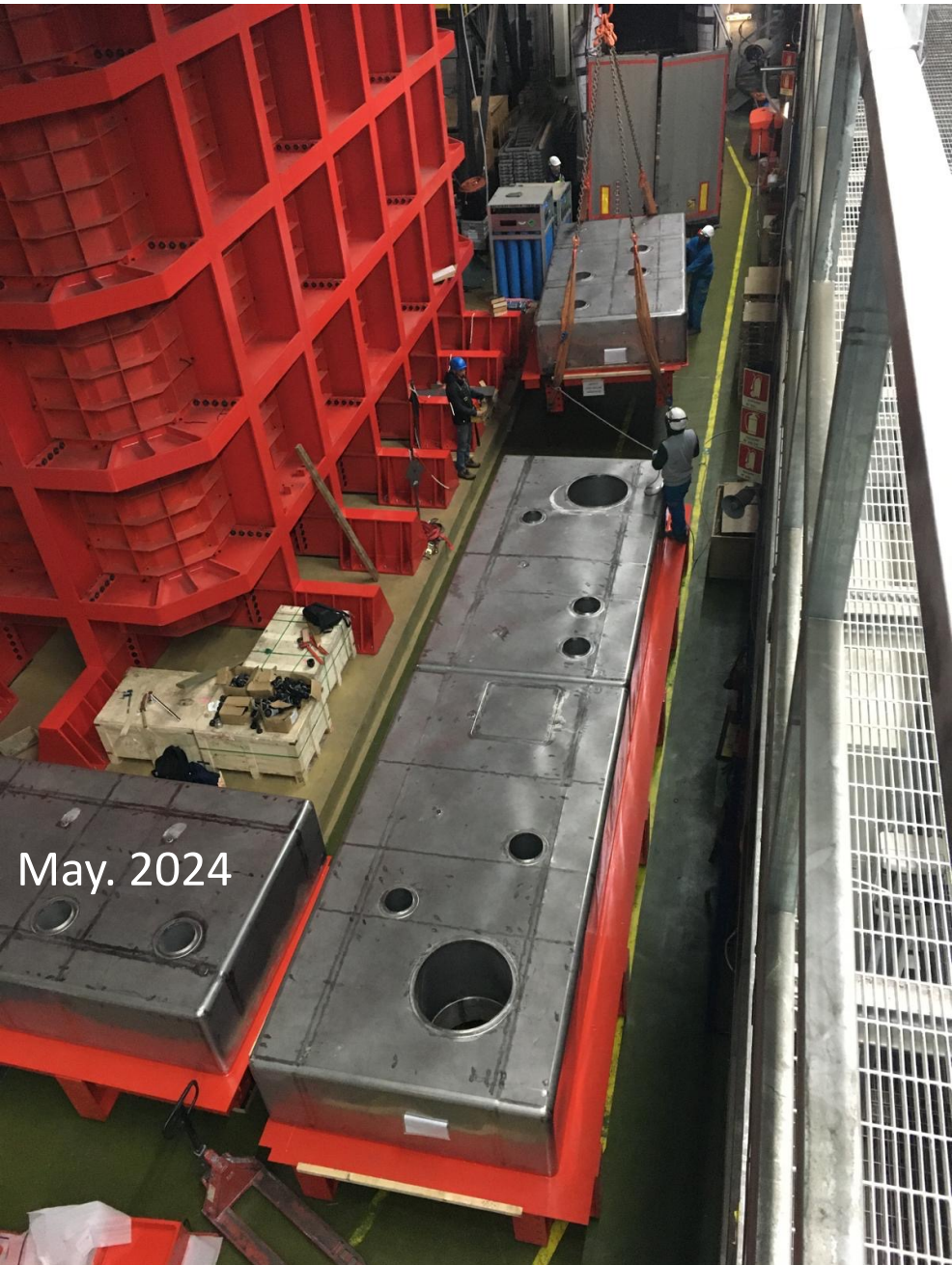
Cryostat construction – new pics

It is not golden!



May. 2024

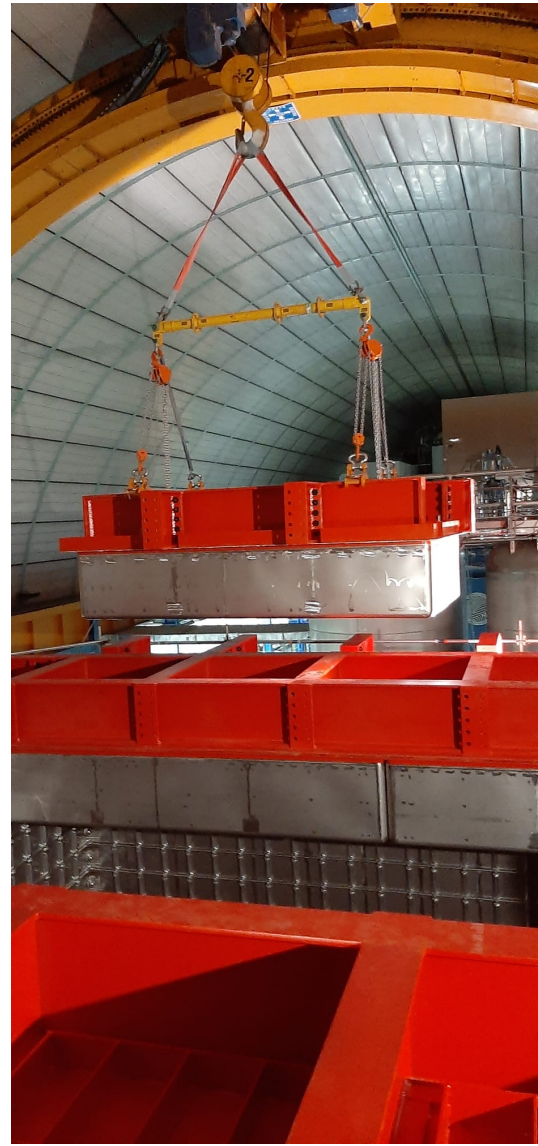
Cryostat construction – top caps



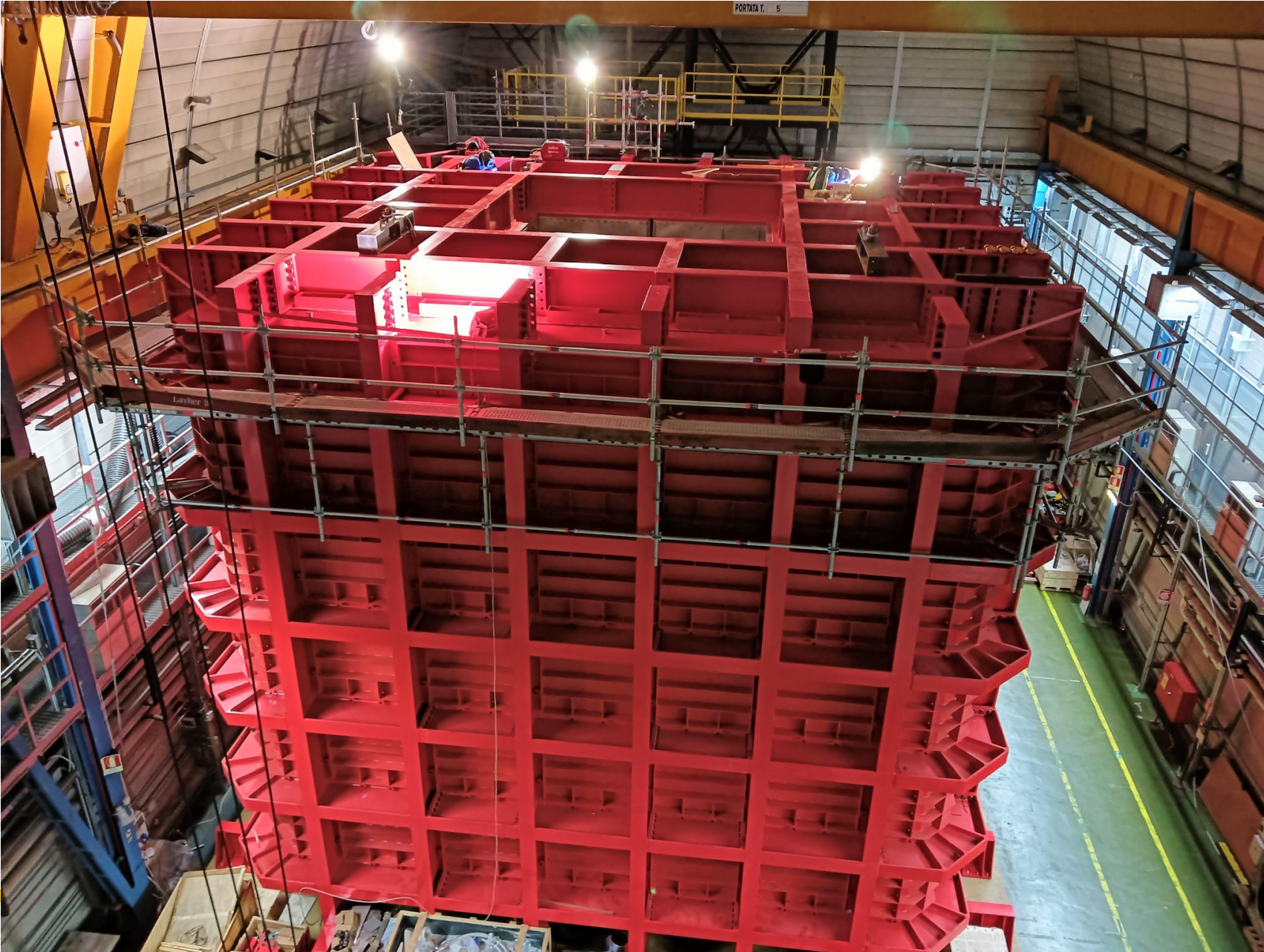
May. 2024



g - June 2024



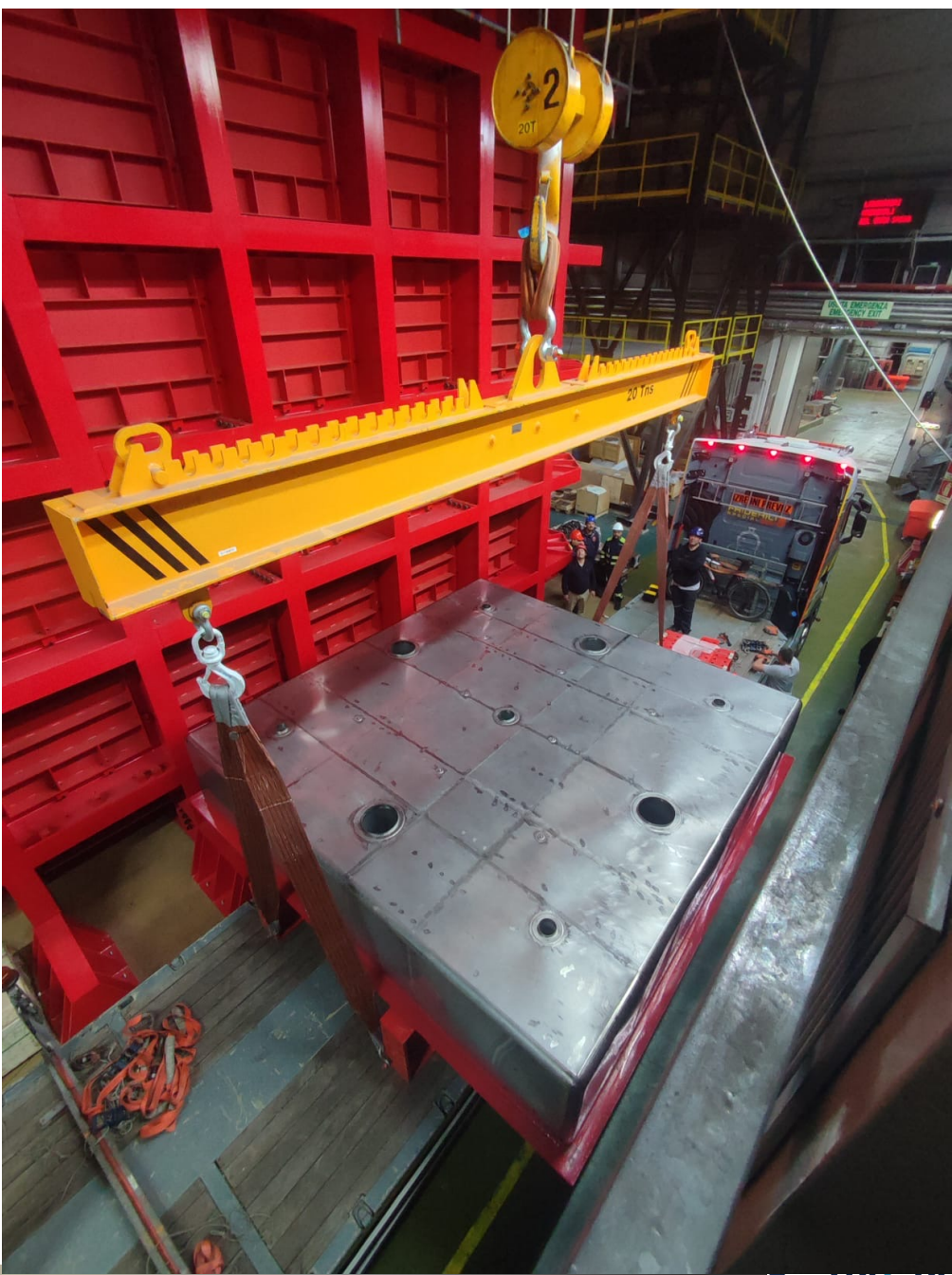
Cryostat construction – June 11



Cryostat construction



Central top cap unloaded on Wed 12 night



Completion in June



- Central top cap test-installed last week
- All flanges on penetrations were installed and leak tested (last week)
- Magnetic particle testing and dye penetrant tests on welding of cryogenics top cap completed by June 17
- Global leak test of the insulation volume for the top caps in the week of June 17-21
- If leak test are all passed, Gabadi leaves by June 25.
- This week, CERN should then visit and declare the cryostat work complete.

Upcoming activities

Access

- Access to the cryostat can always happen through a basket that was purchased months ago and is connected to the crane. A scaffolding needs to be installed as well (plan to re-use a clean one from Borex)
- Scaffolding installed by Gabadi all around roof perimeter. Plan to keep it in place for O(1 year).
- Need to plan with LNGS safety courses to allow collaboration people in (confined space).

False floor

- Discussed in Marco C.'s presentation, to be installed in the Fall. Purchase procedure agreed with LNGS.

Top Caps

- Contacted same bonded warehouse that stored cryostat material during construction
- Quotation received (<20k€ for two years, with option to extend). To be finalized; then tender can start.
 - Open discussion within Collab. on whether to store central top cap there or at LNGS underground.



Risk register

2020-026	Threat	Increased cost of membrane cryostat procurements (materials & installation)	Cryostat	Zani	Impacting	ott-23	→ CAN BE RETIRED
2020-028	Threat	Installation of the cryostat takes longer	Cryostat	Zani	Approaching	dic-23	→ CAN BE RETIRED
2021-064	Threat	Inadequate support from LNGS for Cryostat Installation	Cryostat	Zani	Impacting	ago-23	→ CAN BE RETIRED
2021-065	Threat	Cryostat clean room for detector installation takes longer and/or higher cost	Detector Installation	Zani	Distant	lug-25	
2021-066	Threat	Permissions to access Installation clean area is delayed	Detector Installation	Zani	Distant	set-25	
2023-085	Threat	Plastic moderator addition impacts cost & schedule	Detector Installation	Nessi	Approaching	set-24	
2023-086	Threat	Supply Chain Interruptions	Unassigned	Nessi	Impacting	dic-24	
2023-091	Threat	Detector installation takes longer than baseline plan	Detector Installation	Zani	Distant	lug-26	



Thank you



Back Up



Overall schedule, as of Forti report Q1-2024 report

