

n_TOF Technical Report at the 67th INTC Meeting

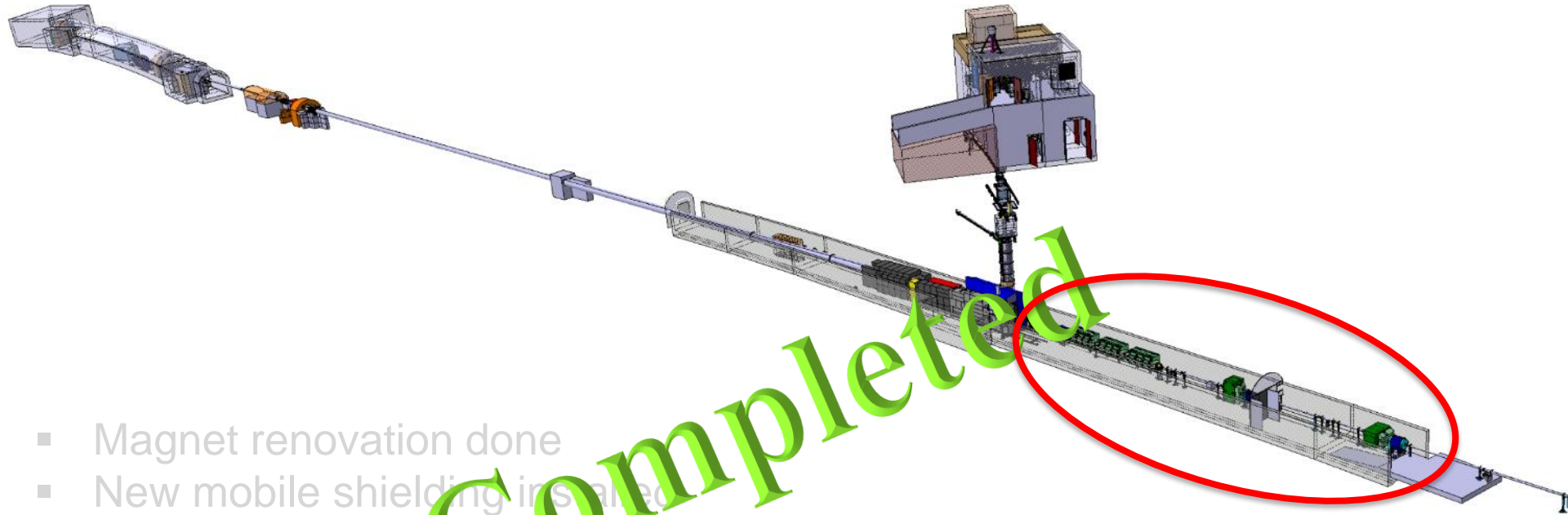
Oliver Aberle, SY-STI-TCD



Outlook LS2

- Main activities for LS2 - Facility
 - Work in FTN line (PS closure 23rd October)
 - **Spallation target exchange**
 - **Water cooling station**
 - **Target shielding modification**
 - **Perspective for NEAR-target experimental station**
 - Horizontal beam line
 - Sweeping magnet replacement
 - New collimator N°2
 - NEAR

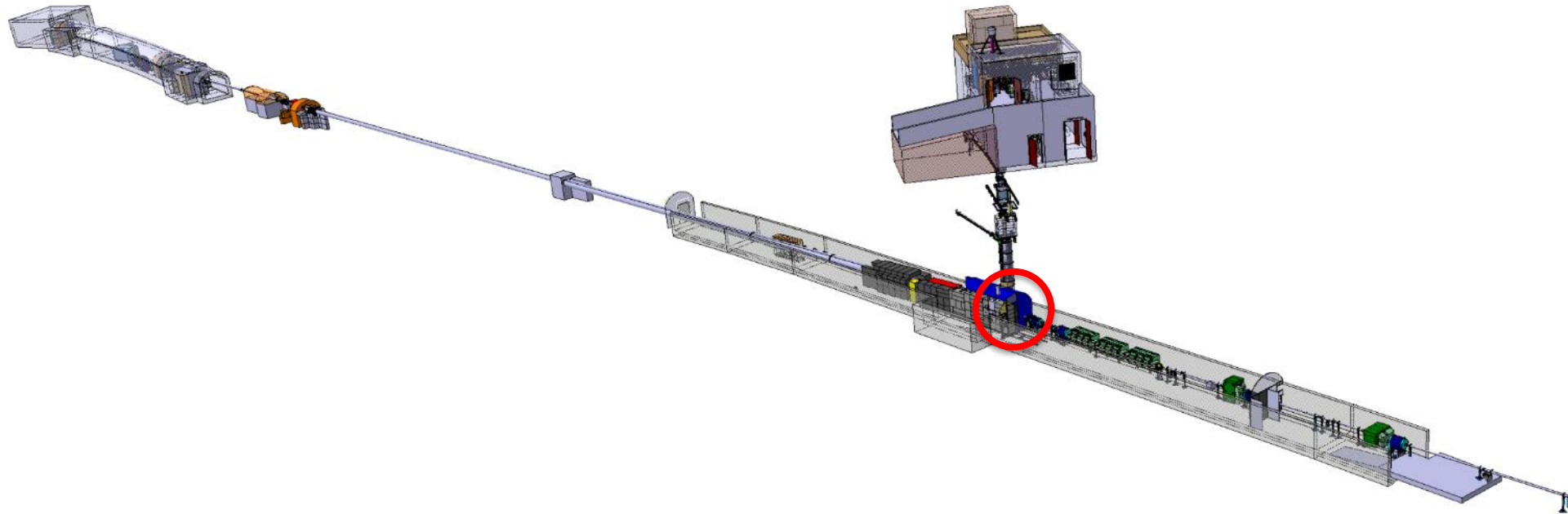
FTN line



Completed

- Magnet renovation done
 - New mobile shielding installed
 - SEM Grid tank installation done, instrument and Be window installation in January 2021
 - Alignment completed, line closed and under vacuum
 - Cabling completed
-
- Access last week to check ventilation door tightness

n_TOF target and mobile shielding

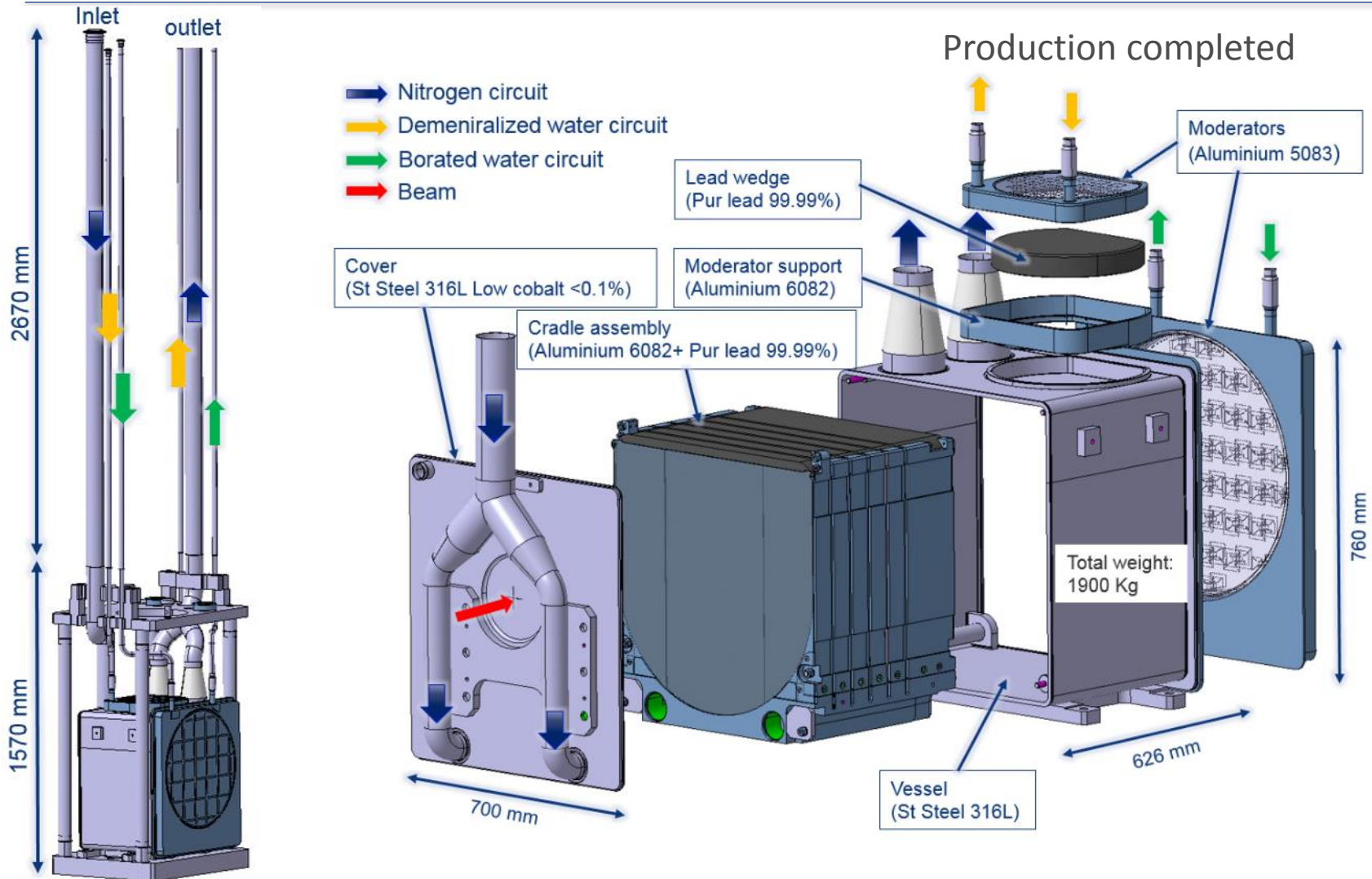


n_TOF spallation target #3

- Engineering Design Report EDMS [TOF-TAR-ES-0003](#)
- Target #3 construction and assembly completed
- Target #3 cold tests w/ nitrogen cooling station operational – February 2021
- Target #3 Installation Review (TIR) – end of February 2021 (<https://indico.cern.ch/event/984553/>)
- Target #3 installation in the pit and vertical beam line installation – March/June 2021 **completed**
- n_TOF readiness for beam mid-July 2021

Beam on target planned for 19th July 2021 (see [ACC-PM-MS-0002 \(v.4.0\) MASTER SCHEDULE OF THE LONG SHUTDOWN 2 \(2019-2020\)](#))

n_TOF target #3



n_TOF target #3



Target and vertical beam line installation



Target and vertical beam line installation



Target and vertical beam line installation



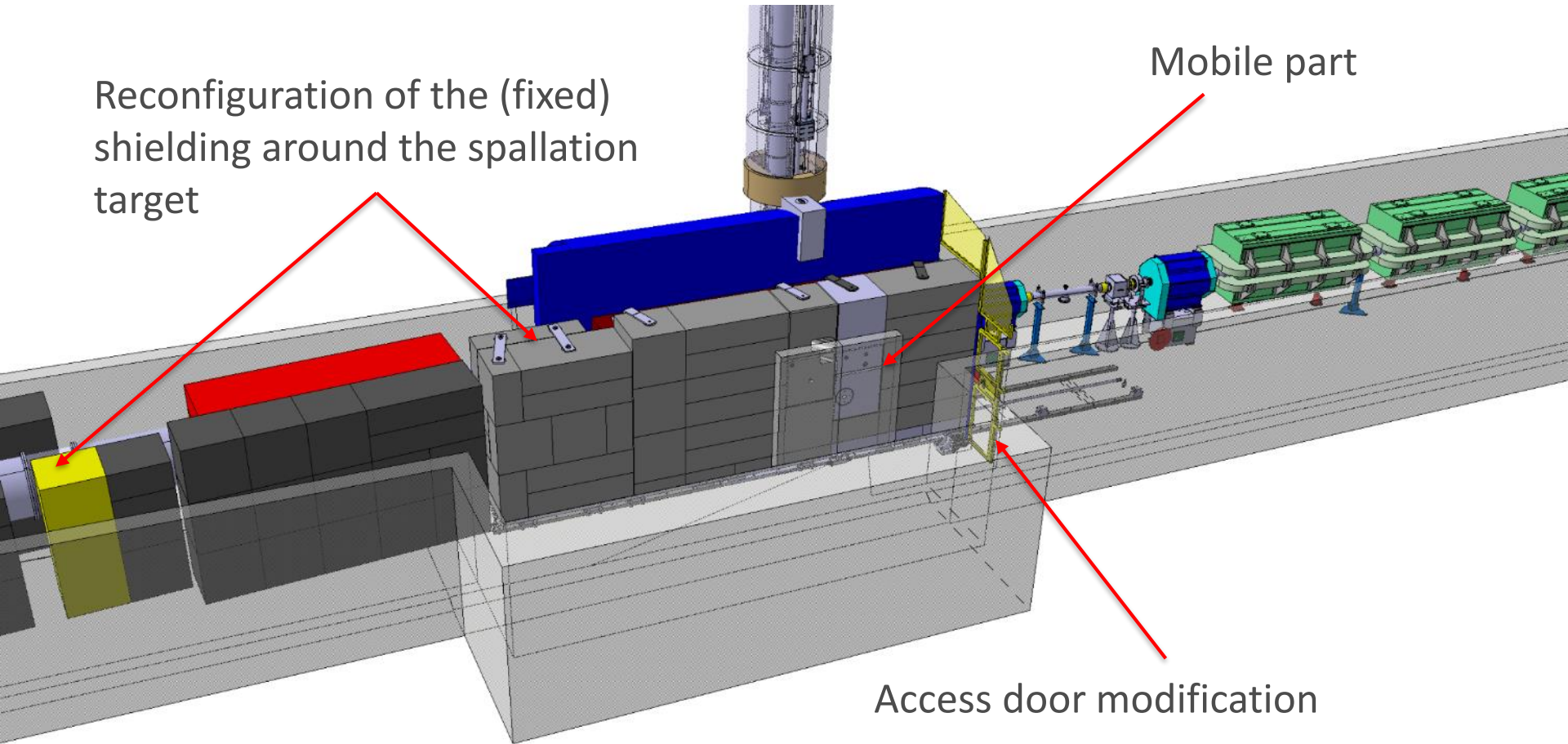
n_TOF target shielding

Third Generation n_TOF Spallation Target and Vertical Neutron Beam Line
EDMS [TOF-TAR-EC-0001](#)

Reconfiguration of the (fixed) shielding around the spallation target

Mobile part

Access door modification



n_TOF – original pit (April 2020)

20 years

Target pit ±1999

Target pit April 2020



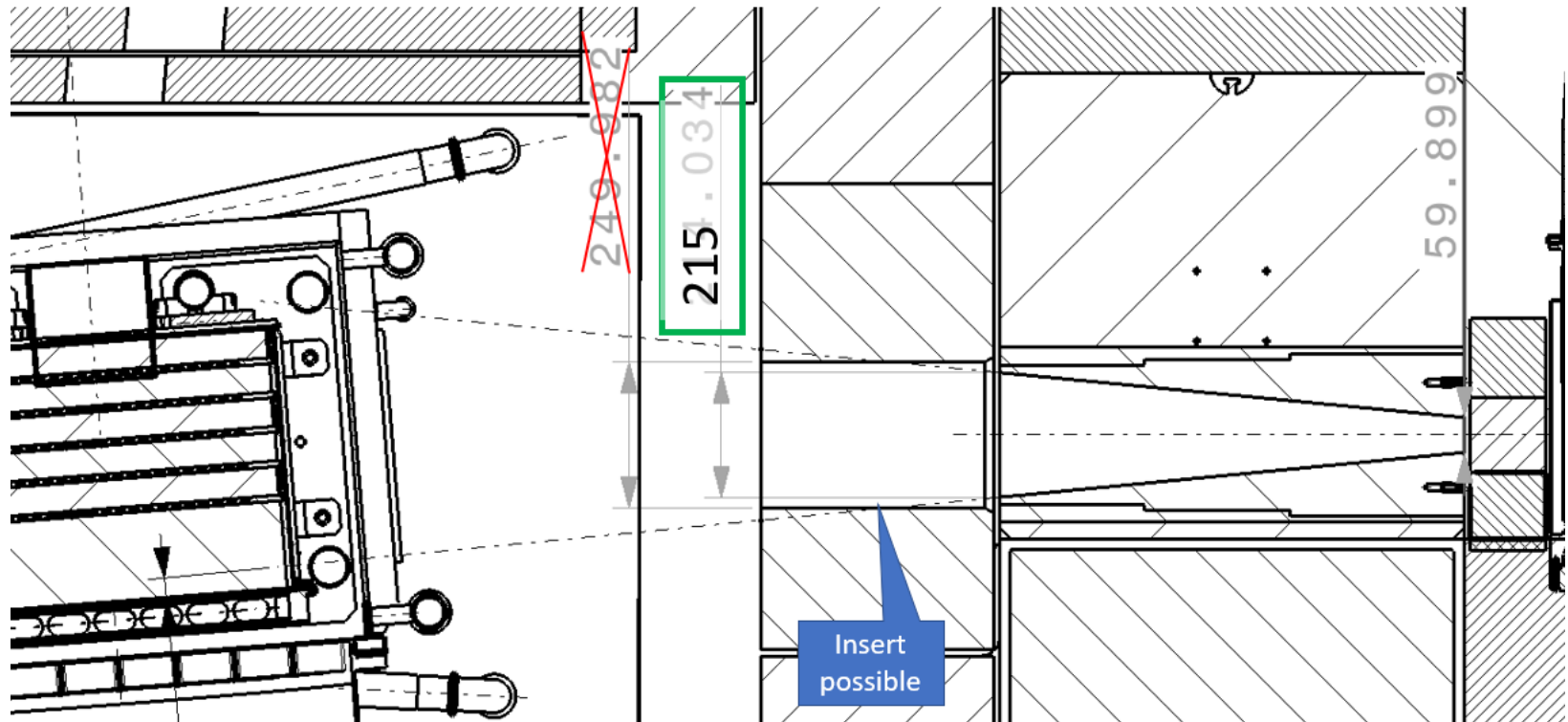
n_TOF target mobile shielding



Perspectives on "NEAR-target" station

- Discussions and details in TOF-PM-WD-0001
- Priority is to get facility running post-LS2, meaning target, shielding & neutron beam line components – funded in a resource-loaded schedule (phase 1)
- Study for physics-driven NEAR station currently ongoing, with implementation post LS2 under evaluation (phase 2)
- Dedicated movable/exchangeable moderator on the shaping collimator aperture
- Full size plug under construction for handling tests
- → post LS2 possible

Shielding details for “NEAR”



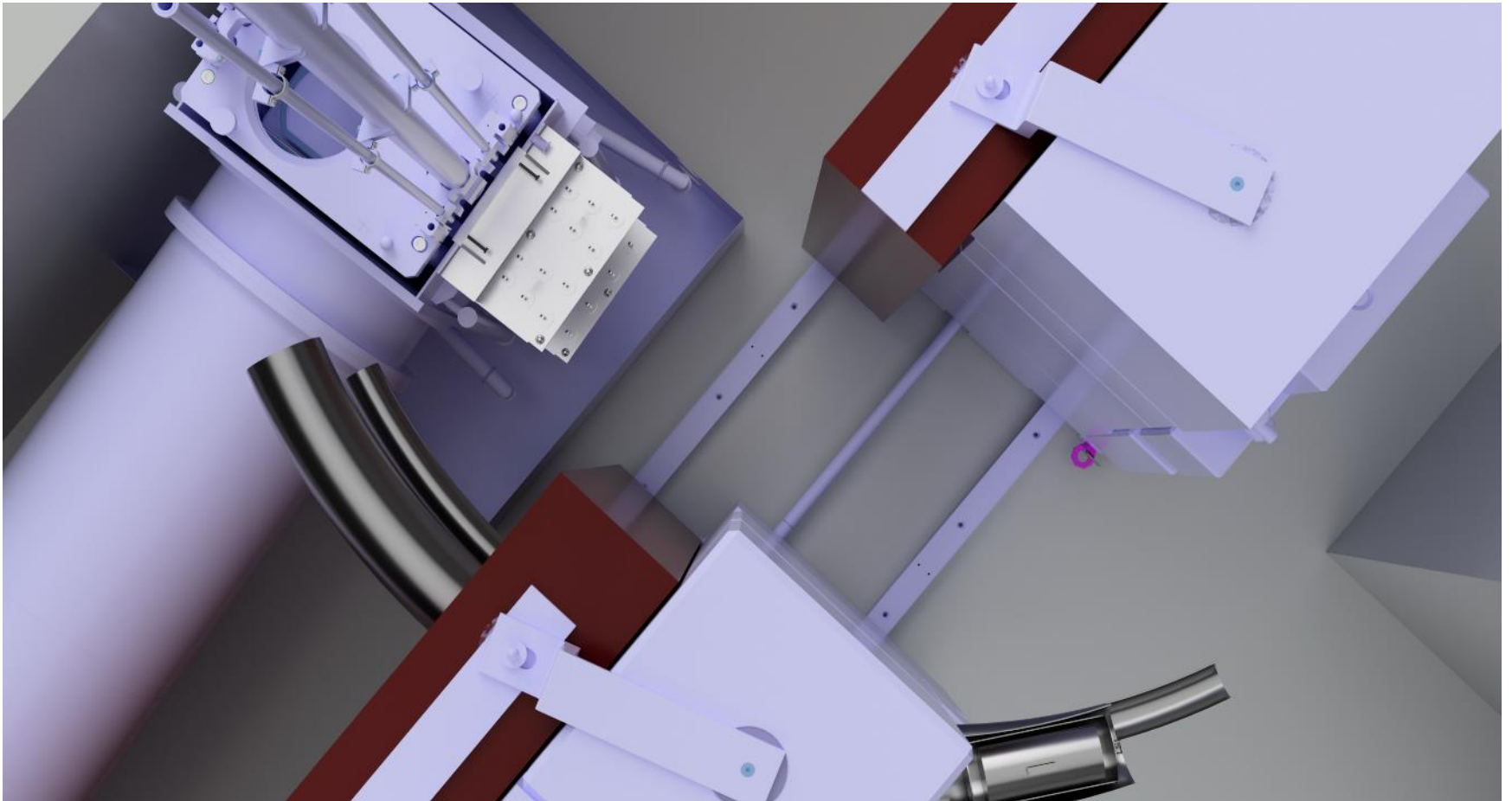
In-shielding with collimator insert, space for moderator and samples

Shielding details for “NEAR”



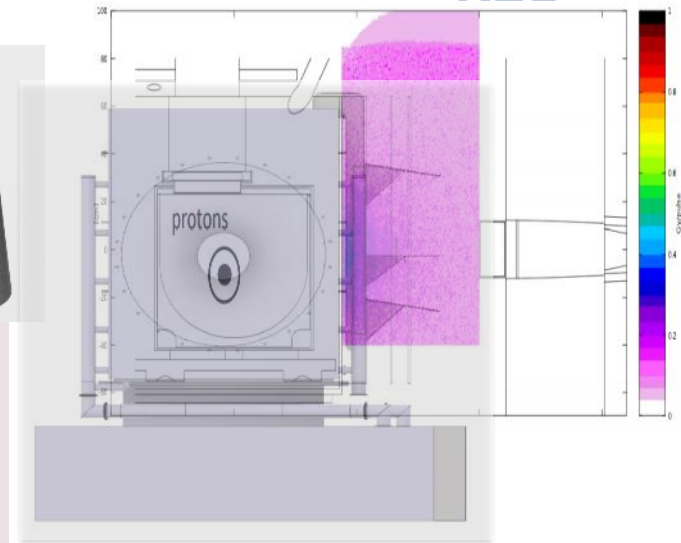
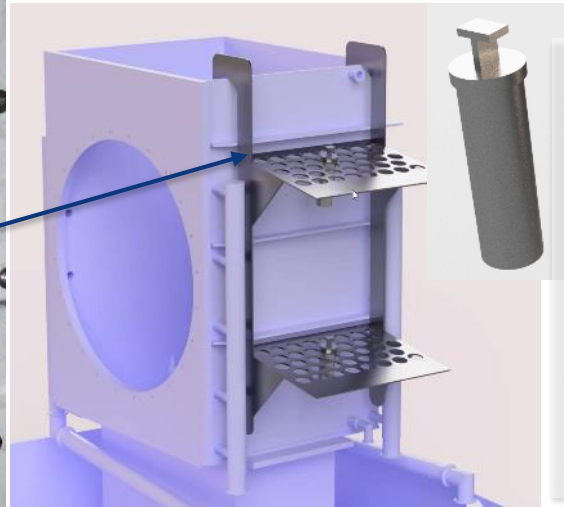
Collimator insert and lifting spreader test

Shielding details for NEAR



Investigate on possibilities and interest for irradiation for R2E, R2M and physics

Perspectives for NEAR target station



- Synergistic irradiation of materials for acc. complex (R2M) in mixed-field conditions at unprecedented levels at CERN
- 0.3-0.5 Gy/pulse (**~1 MGy/y**), homogeneous over “large” volumes

AP. Bernardes, M. Maeder, M. Ferrari, D. Senajova, M. Barbagallo

NEAR

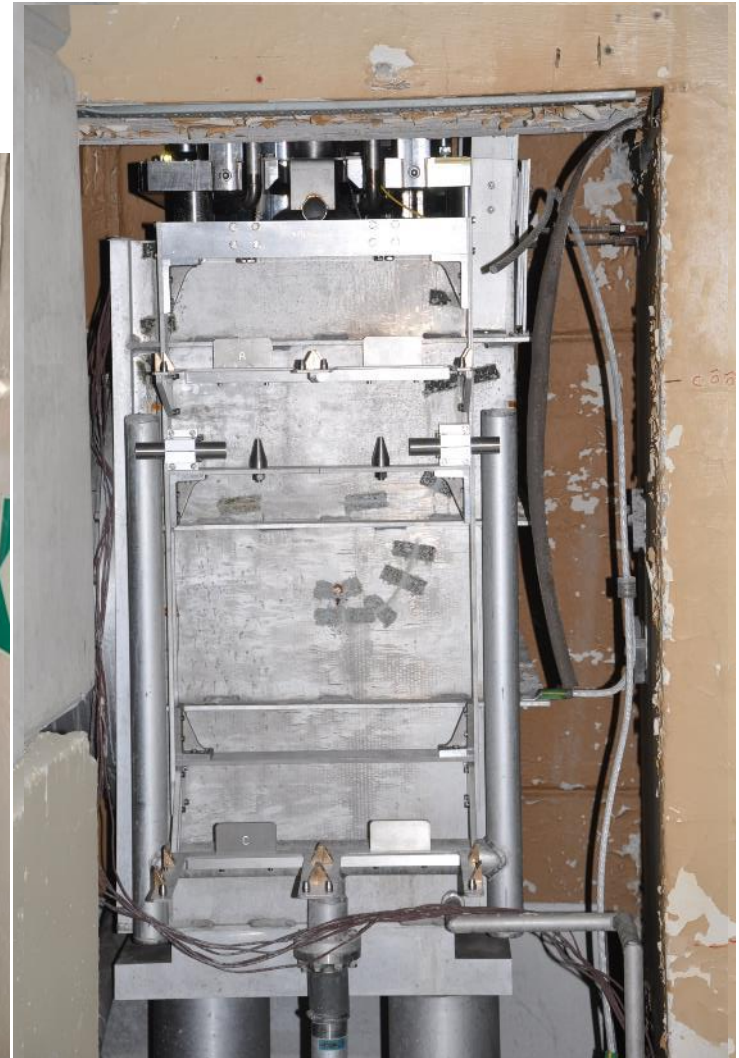
- Test for accessibility done
- Shelf installed last week

Courtesy D. Senajova

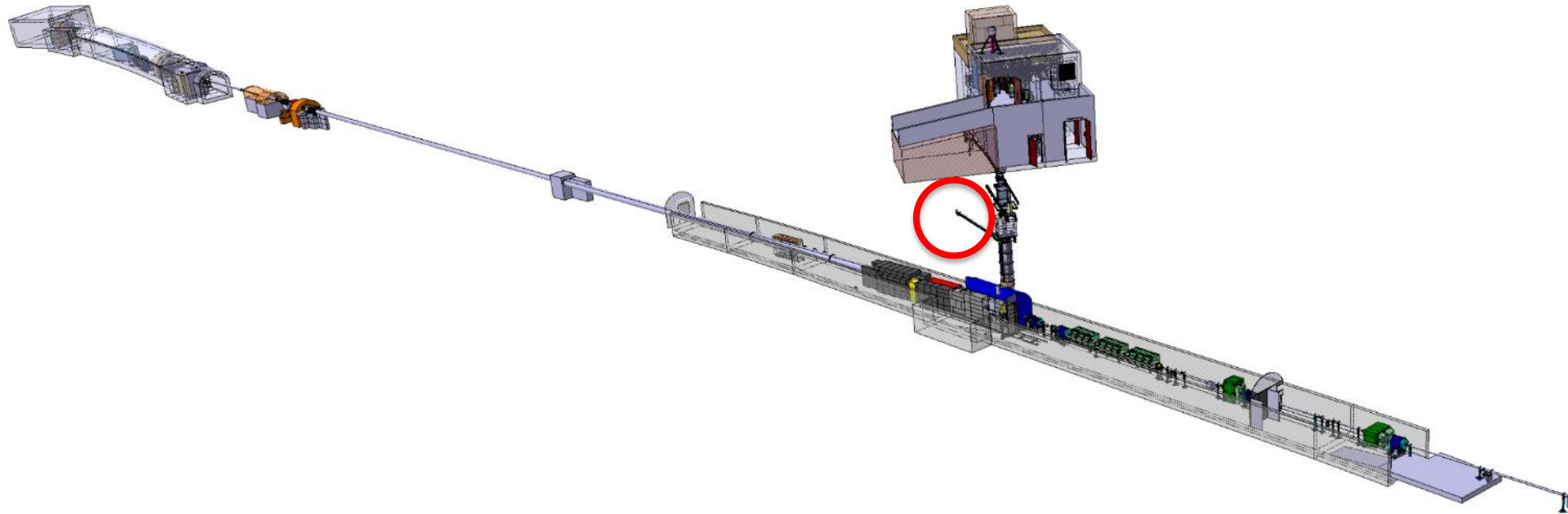


NEAR

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n_TOF water cooling station



Target #3 cooling and moderator station

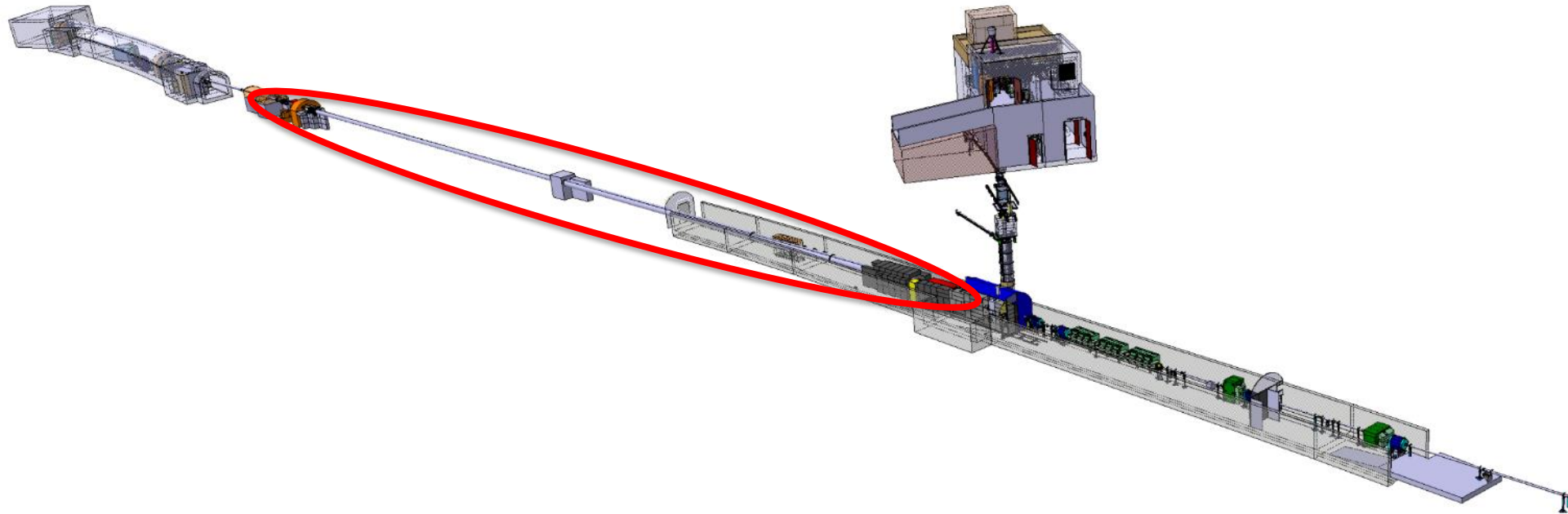
- Target nitrogen cooling required the full replacement of the target cooling and moderator circuits
- Major efforts from CV to develop the technology to match the specifications and RP requests ([EDMS 2068336](#))

F. Dragoni



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n_TOF horizontal beam line (TT2A)



New sweeping magnet

Vacuum chamber inserted and welded



Alignment today



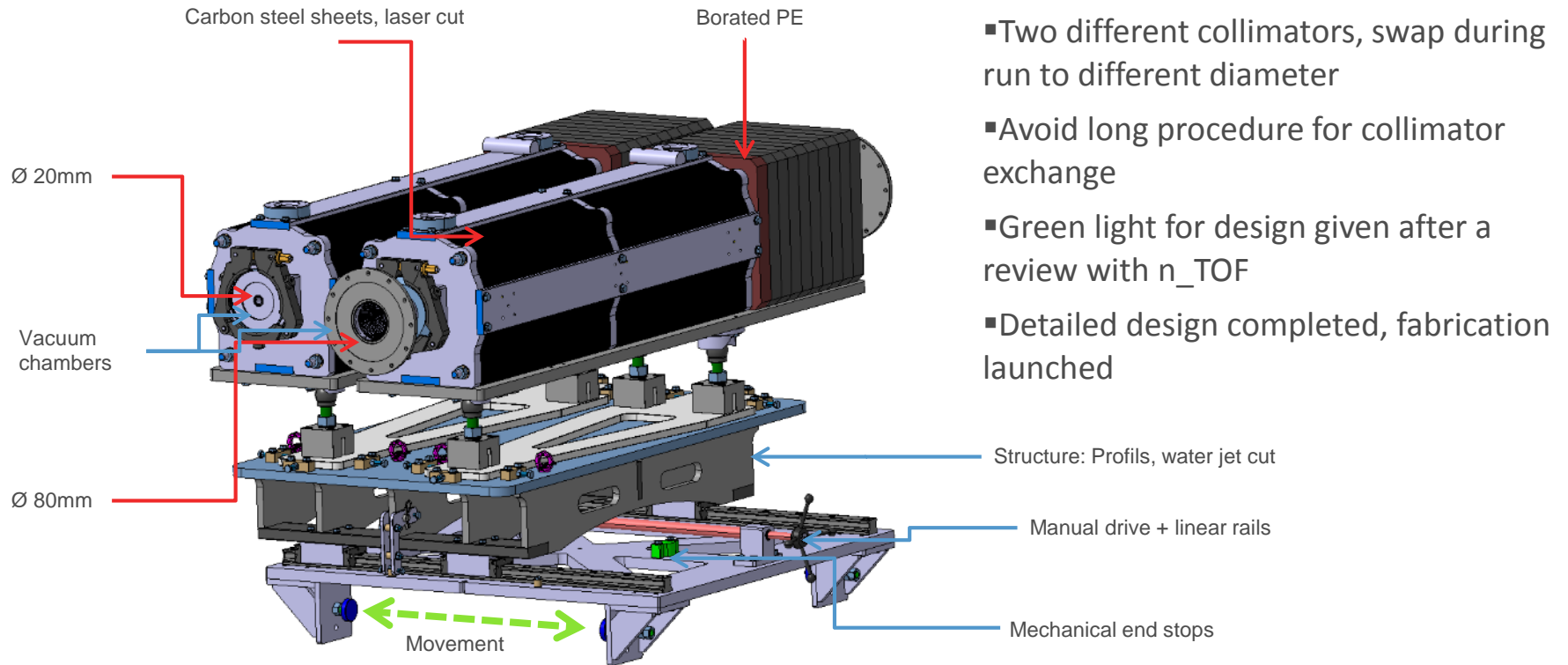
Original second EAR 1 collimator

Consolidation of
collimator N°2

Functional specification
TOF-T-ES-0001 (v.0.1)
New Second Collimator
in the Horizontal n_TOF
Neutron Beam Line



New collimator #2 → EAR1



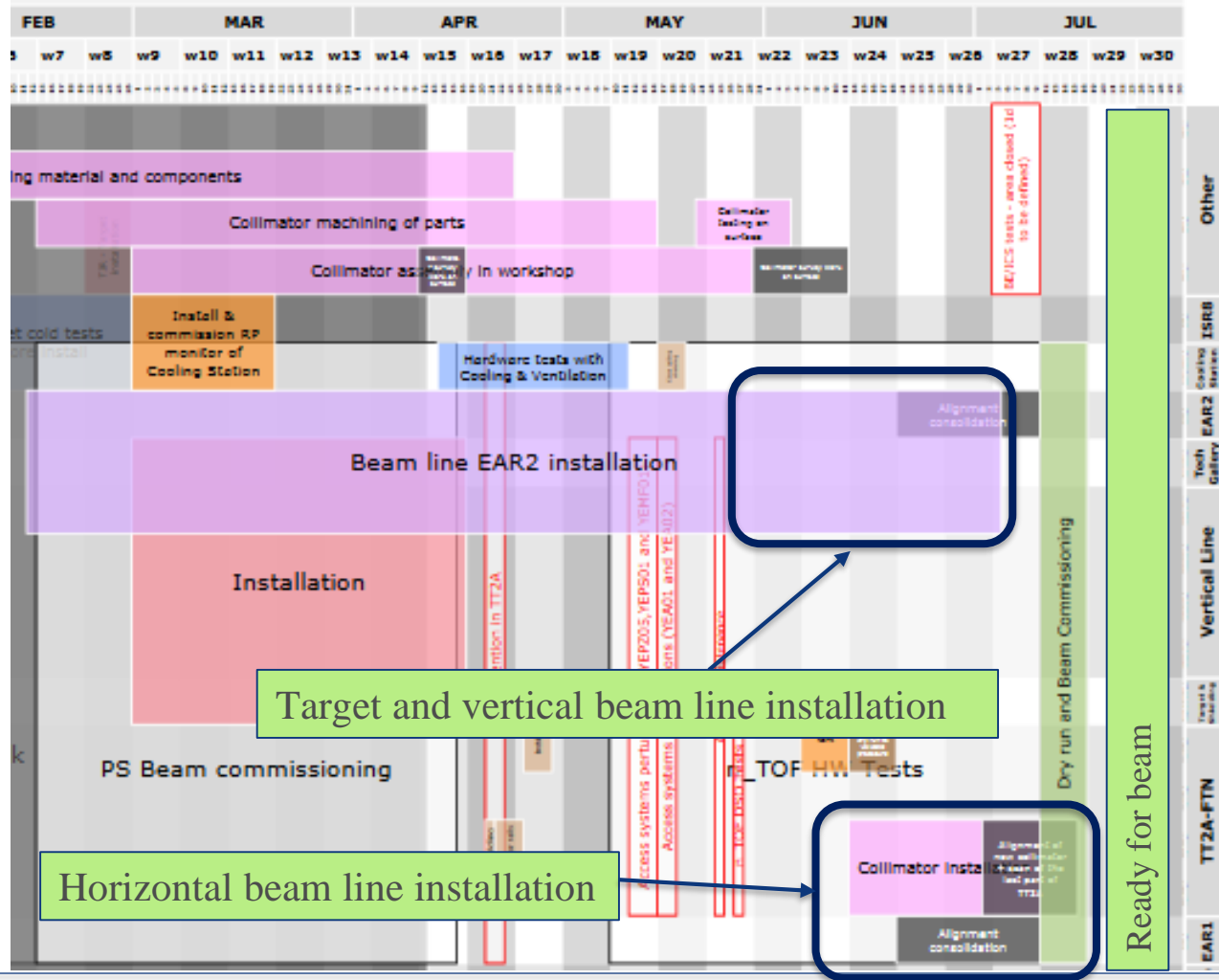
Assembly ongoing, installation planned week 27

n_TOF Experiment LS2 activities

- Cabling campaign in EAR1 (remove the old sweeping magnet cables, replace the detector cables in the rack/bunker area) - Completed
- Implementation of the ASN-OFSP safety recommendations in EAR2
- Consolidation of the gas system in EAR2 - ongoing
- Consolidation of the alignment system – after beamline remounting
- Upgrade of the n_TOF electronics laboratory - completed
- Control room and offices ready
- DAQ upgrade
- Consolidation and R&D program for detectors - ongoing

Schedule and coordination

- n_TOF Facility Refurbishment Project Schedule: EDMS 2001626



Conclusions

- Target installed
- Cooling and moderator stations up and running
- Vertical beam line completed
- Horizontal neutron beam – collimator to finalize and to install
- Upgrades and consolidation in both Class A laboratories
- First beam on target 19th July 2021