

n_TOF Report

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ENGINEERING
DEPARTMENT

Outlook

- n_TOF organization during LS2
- Main activities for LS2 - Facility
 - Horizontal beam line
 - Target exchange
- Main activities for LS2 – Experiment
 - Electronic lab
 - Detectors

n_TOF organization during LS2

- **n_TOF Experiment LS2 Coordination Meetings (chair: D. Macina)**

- INDICO link: <https://indico.cern.ch/category/10884/>
- Mandate: Coordinate the LS2 activities in the experimental areas (EAR₁, EAR₂), in the electronics laboratory and control room
- Meeting frequency: Twice a month

- **n_TOF Facility Technical Coordination Meetings (chair: O. Aberle, scientific secretary: M. Barbagallo)**

- INDICO link: <https://indico.cern.ch/category/11206/>
- Mandate: Steering of global activities related to the n_TOF Facility during LS2
- Meeting frequency: Every 6 weeks

Main n_TOF LS2 activities

BEAM LINE

- Replacement sweeping magnet in EAR1 with a permanent one (same technology as in EAR2)
- Installation of a new system remotely controlled to exchange big and small second collimator in EAR1)
- New SEM grid upstream of the target in the FTN line (replacing a BTV)

EAR1 AND EAR2 (TYPE A LABORATORY)

- Implementation of the recommendation by the French and Swiss authorities in matters of safety:
 - Audible alarms for beam imminent warning, fire detection and ventilation stop
 - buffer zone
 - sink to wash hands
- Remote monitoring gas system

CONTROL ROOM

- Move control room and offices to barrack 506 close to EAR2

ELECTRONIC LABORATORY

- Install a laboratory to develop, test and commission detectors to be used for the new beam line commissioning and physics data taking
- About 50 m2 equipped with:
 - Fume cupboard to handle chemicals and for soldering
 - Mini-DAQ -> standard data taking (only calibration mode) and storage data same format as in operation
 - Standard furniture
 - Tests with radioactive sources
- Possible location:
 - Either new barrack 506 (preferred) or
 - Barrack 547 (actual laboratory) to be upgraded in space and equipment

DAQ

- Consolidation work
- WEB interface to the nTOF database for the handling and bookkeeping of operational data and information

BEAM OPERATION

- Discussion with OP and BI on how to improve beam monitoring in view of the higher intensities reachable by the injectors
- Discussion with CO on a dedicated nTOF VISTAR page to improve communication

NEW TARGET

- Remove target No. 2 and replace it with a new design, Target No. 3

NEW TARGET SHIELDING

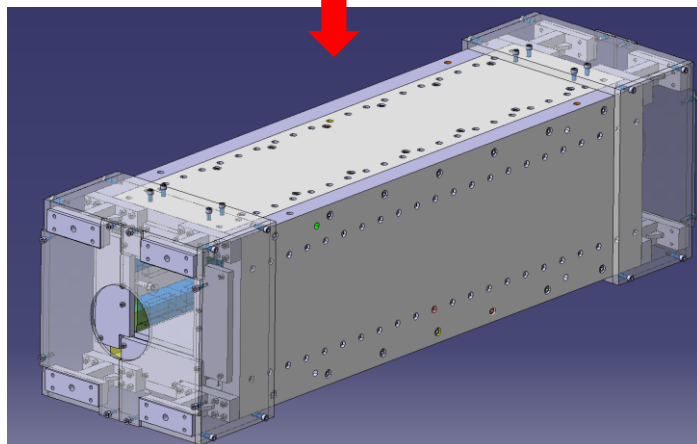
- Remove fixed wall shielding and replace it by a mobile shielding

RENEWAL OF COOLING STATION

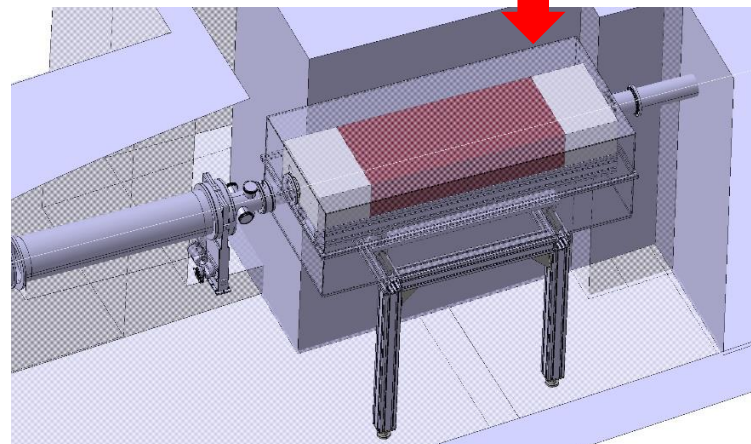
- Dismantle water cooling circuit and replace it with a N2 gas cooling circuit

Main n_TOF LS2 activities

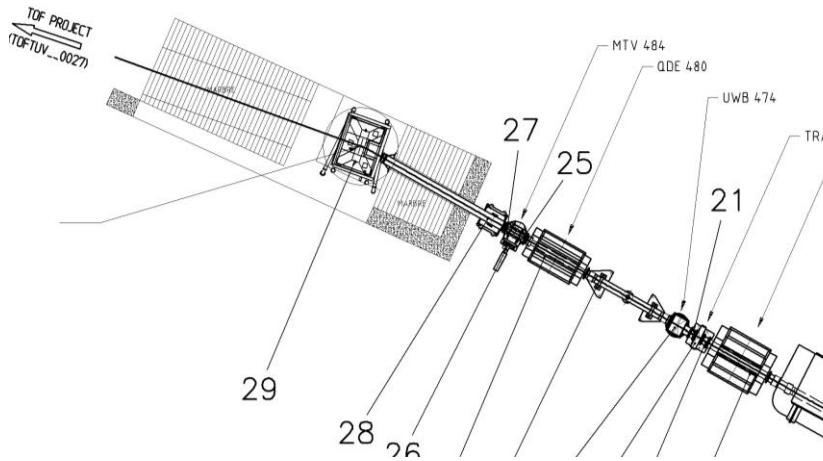
New sweeping magnet



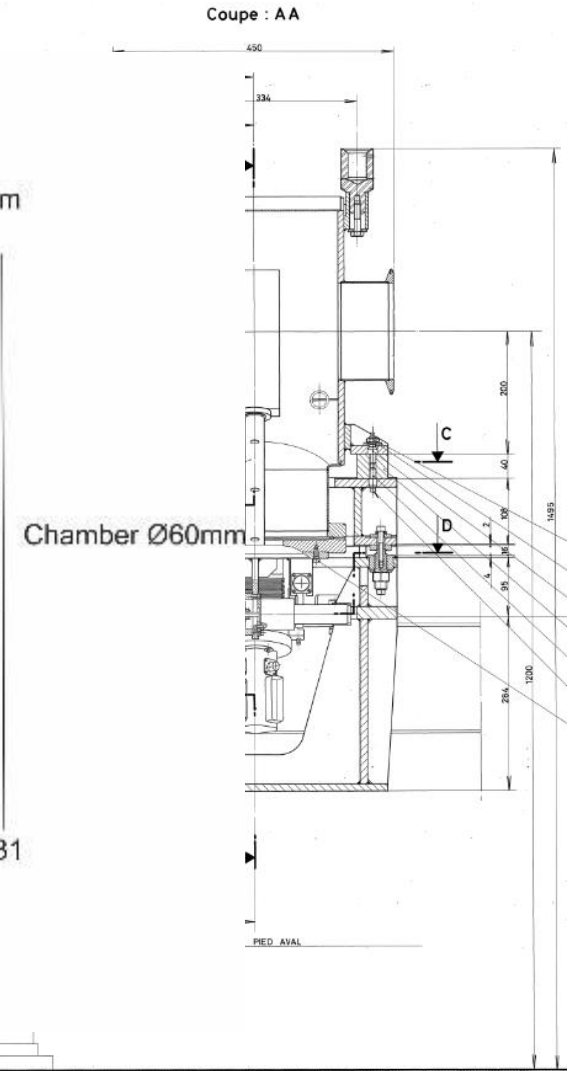
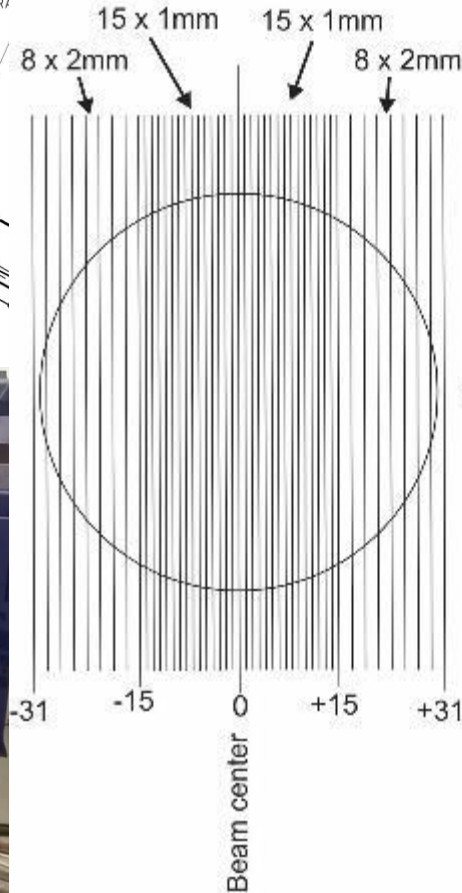
Consolidation of collimator N°2



SEM grid replacing BTV



Grid = 47wires



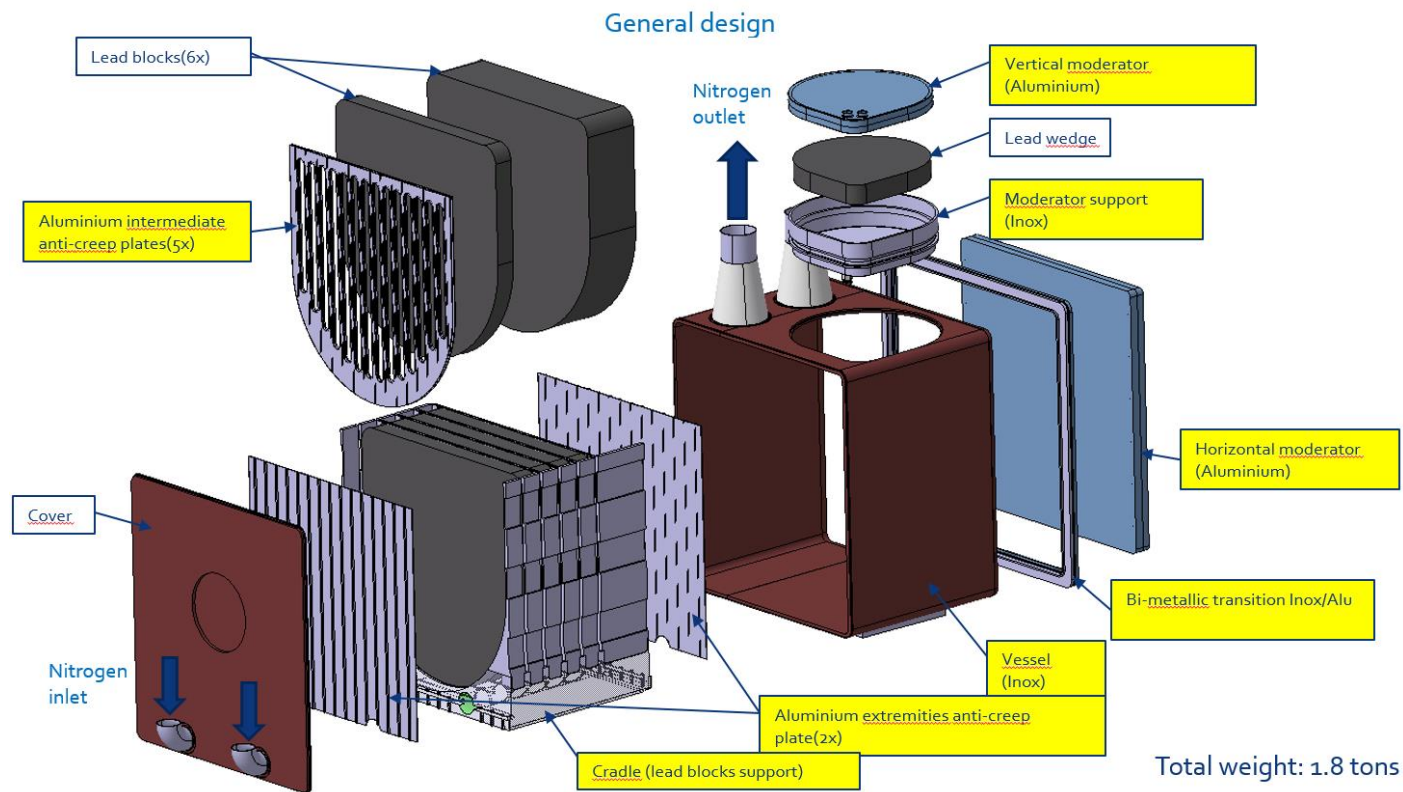
n_TOF target #3

n_TOF Target #3 Production Readiness Review, held on May 29th

https://indico.cern.ch/event/807540/contributions/3360962/attachments/1853310/3044330/n_TOF_Target_review_3.pdf

The review committee will provide a complete list of findings and recommendations around mid-July.

- Go ahead and start production!



n_TOF target #2 removal



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Date.: 2018-05-09

nTOF – Target 2 REMOVAL HANDLING TASKS (Sequence of Operations)

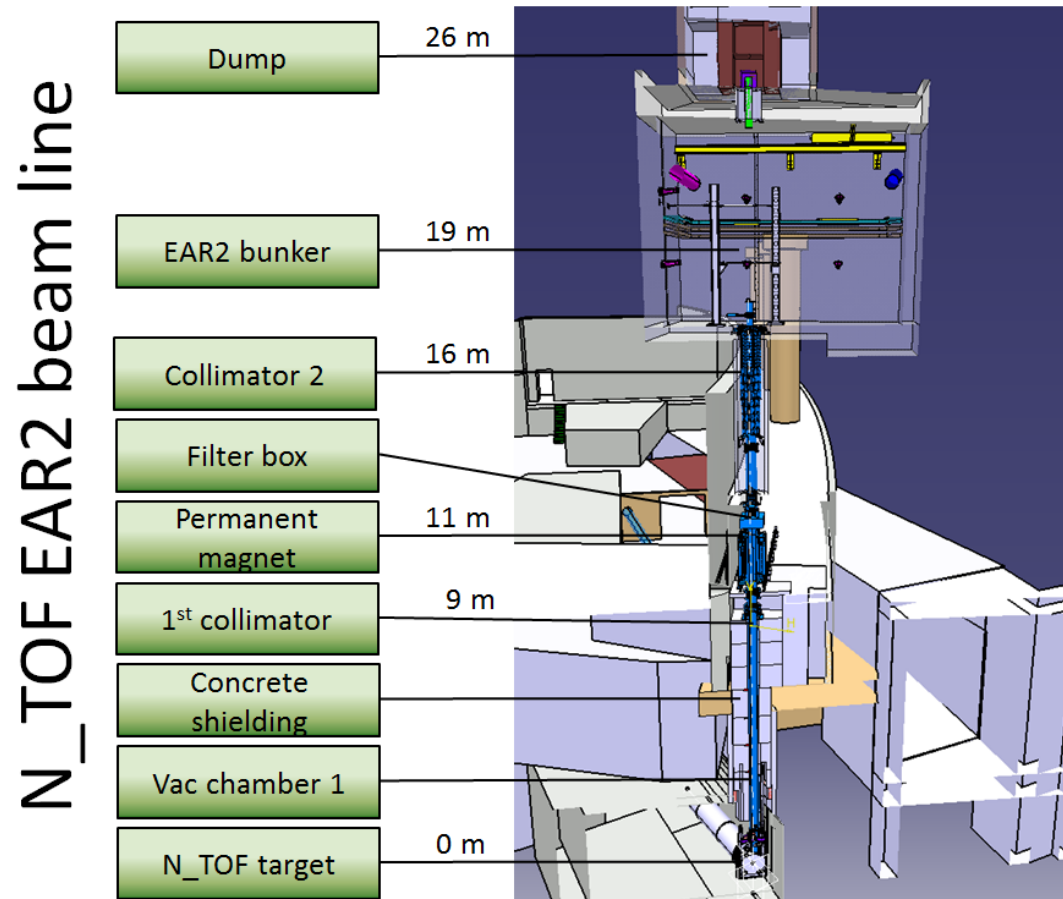
Abstract – This document outlines the tasks needed to remove n_TOF Target 2 in order to allow its replacement with Target 3. The tasks include removal of the equipment and items in the vertical beam pipe to gain access to the n_TOF target 2 from the technical gallery. It is assumed the detectors and the associated equipment have been removed before this work starts.

This document identifies tasks where remote handling will be required. The details of remote handling operations will be covered in a separate document that will be annexed to this document once completed.

DOCUMENT PREPARED BY: H. Crossman O. Aberle K. Kershaw JL. Grenard JF. Gruber S. Girod	DOCUMENT CHECKED BY: M. Calviani O. Aberle JL. Grenard JF. Gruber S. Girod J. Vollaire L. Ulrici M. Di Castro L. Buonocore K. Kershaw D. Grenier N. Roget Y. Body	DOCUMENT APPROVED BY: S. Gilardoni M. Calviani
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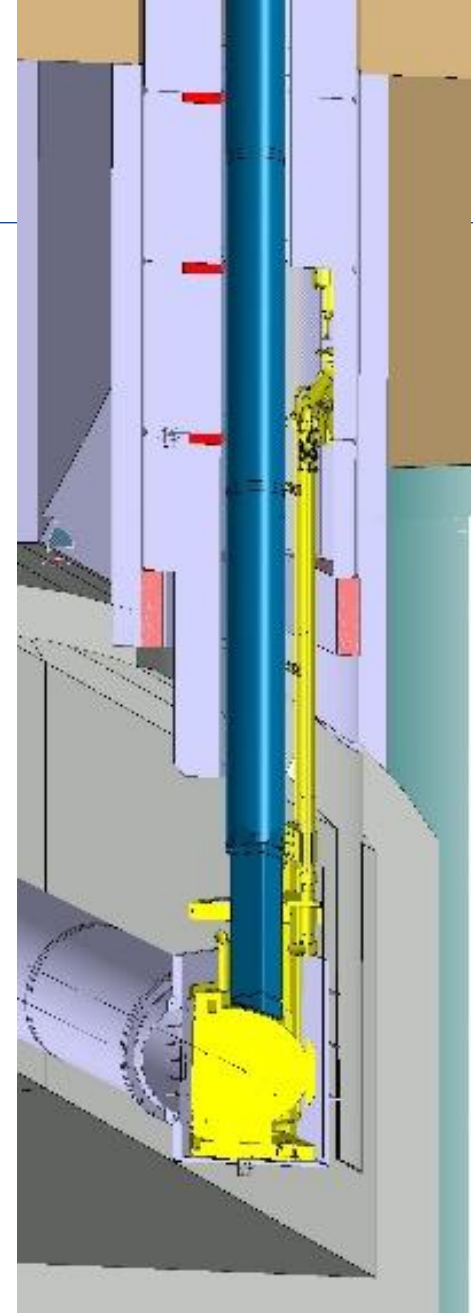
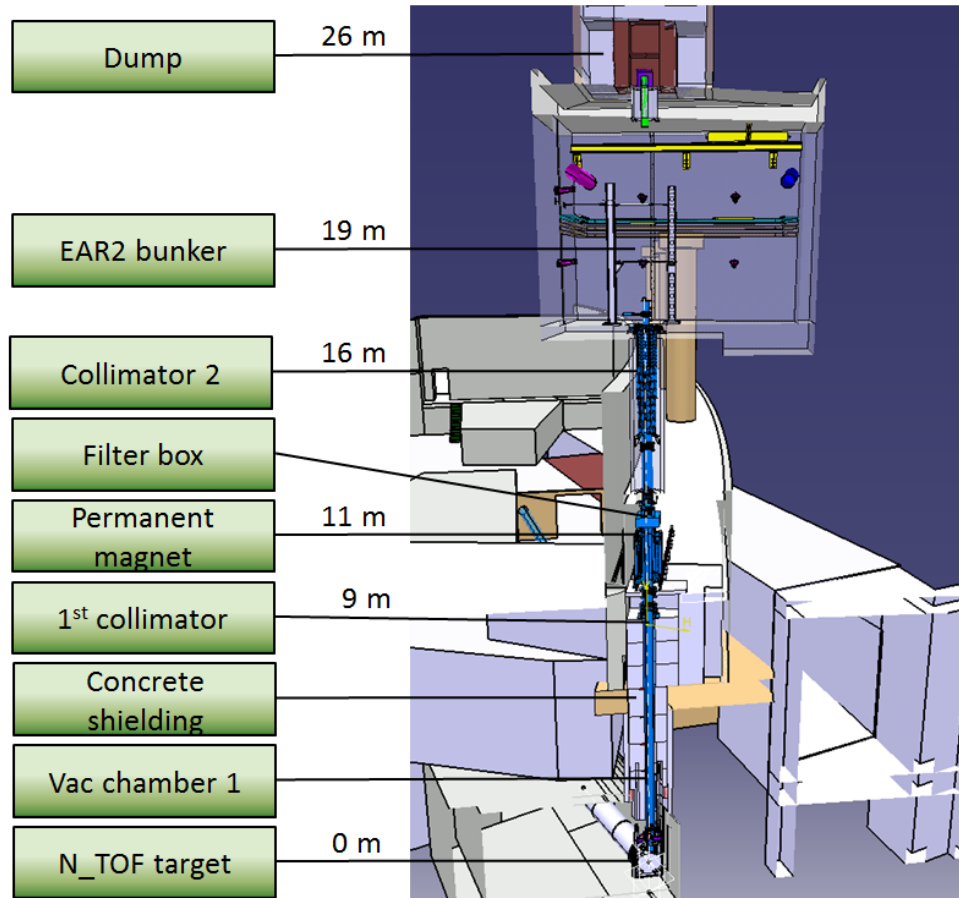
<https://edms.cern.ch/document/1867100/0.4>

n_TOF target #2 removal

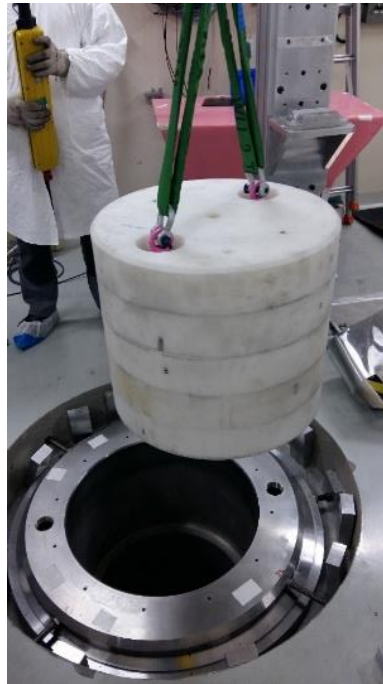


n_TOF target #2 removal

N_TOF EAR2 beam line



Removal of Items Above Technical Gallery



Removal and cutting of vertical n_TOF target beam pipe



Vertical cutting of low activated part



- Dose rates as predicted by simulations (hot spot on the bottom window at 2 mSv/h).
- No contamination found.
- Only the last part (1 m) is classified as contaminated



SAS in EAR 2 above the target pit

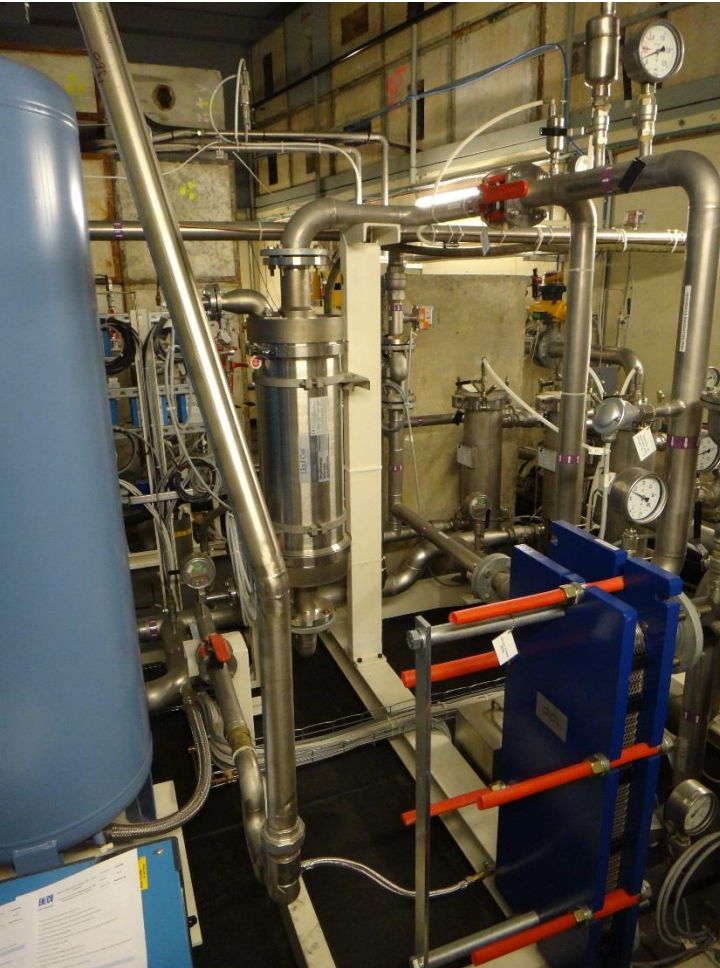


ALARA Committee 03/06/2019:
EDMS [2158214](#)

Low dose upper part of the beam pipe (3 x 2 m, 1 x 1.2m)

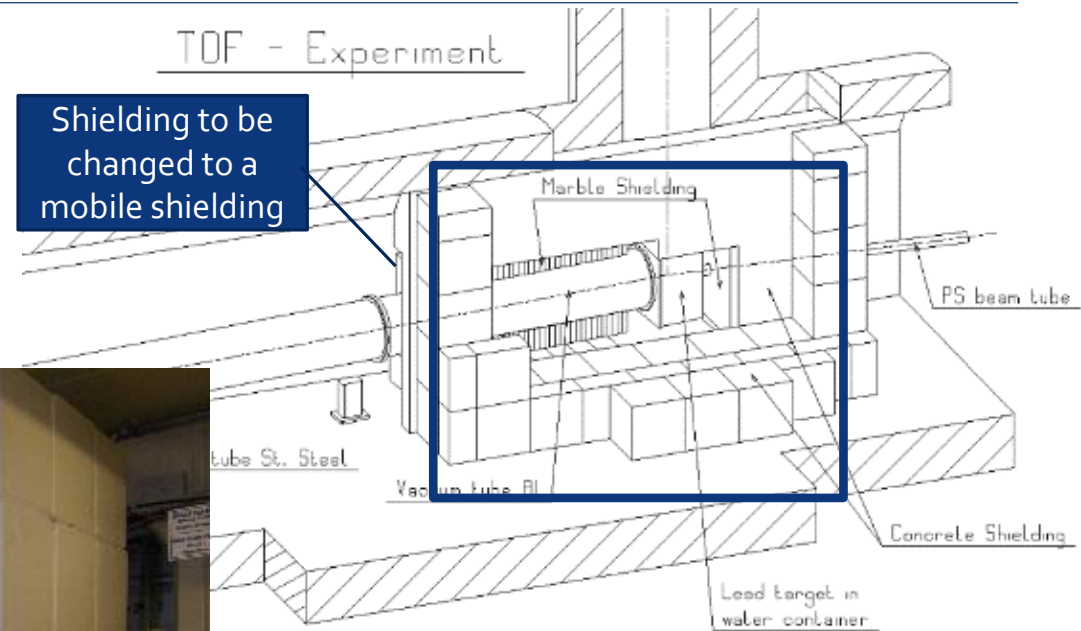


n_TOF target cooling station



Modification of the target side shielding

Reconfiguration of the (fixed) shielding around the spallation target,



which dates back to the original installation of the facility in 1999

nTOF Experiment LS2 Coordination Meeting

- Projects followed up until now:
 - Experimental Areas Preparation for the LS2 work. In particular,
 - remove all radioactive samples and sources to be stored by RP
 - Contamination control performed by RP confirms absence of contamination
 - Cabling campaign in EAR₁ (remove the old sweeping magnet cables, replace the detector cables in the rack/bunker area)
 - Implementation of the ASN-OFSP safety recommendations in EAR₂
 - Consolidation of the gas system in EAR₂
 - Consolidation of the alignment system
 - Upgrade of the nTOF electronics laboratory and control room
 - DAQ upgrade
 - Consolidation and R&D program for detectors

Upgrade of the nTOF electronics laboratory

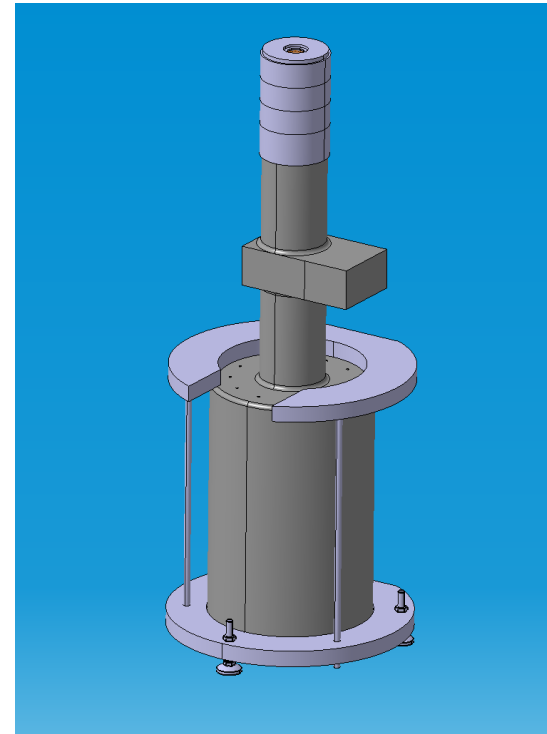
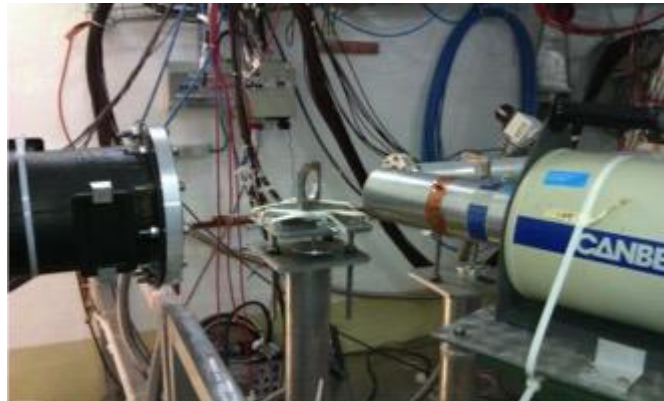
- Doubled the surface
- Laboratory fully equipped to perform tests in parallel on two different detectors
- DAQ system identical to the one used in the areas
- Laboratory declared as Supervised Area to allow tests with sealed sources
- New access system with dosimeter
- Available in autumn 2019



Detector Consolidation and R&D

A new program has been set up for the detector consolidation and R&D (Coordinator M. Barbagallo).

- **Consolidation:** PPAC, Sili Monitor, MGAS, Bicorn Scintillator, L6D6 scintillator, BaF₂, Timepix
- **R&D:** Germanium, Optical TPC, Detector for g-ray detection based on SiPM, Sili for (n,cp) reaction

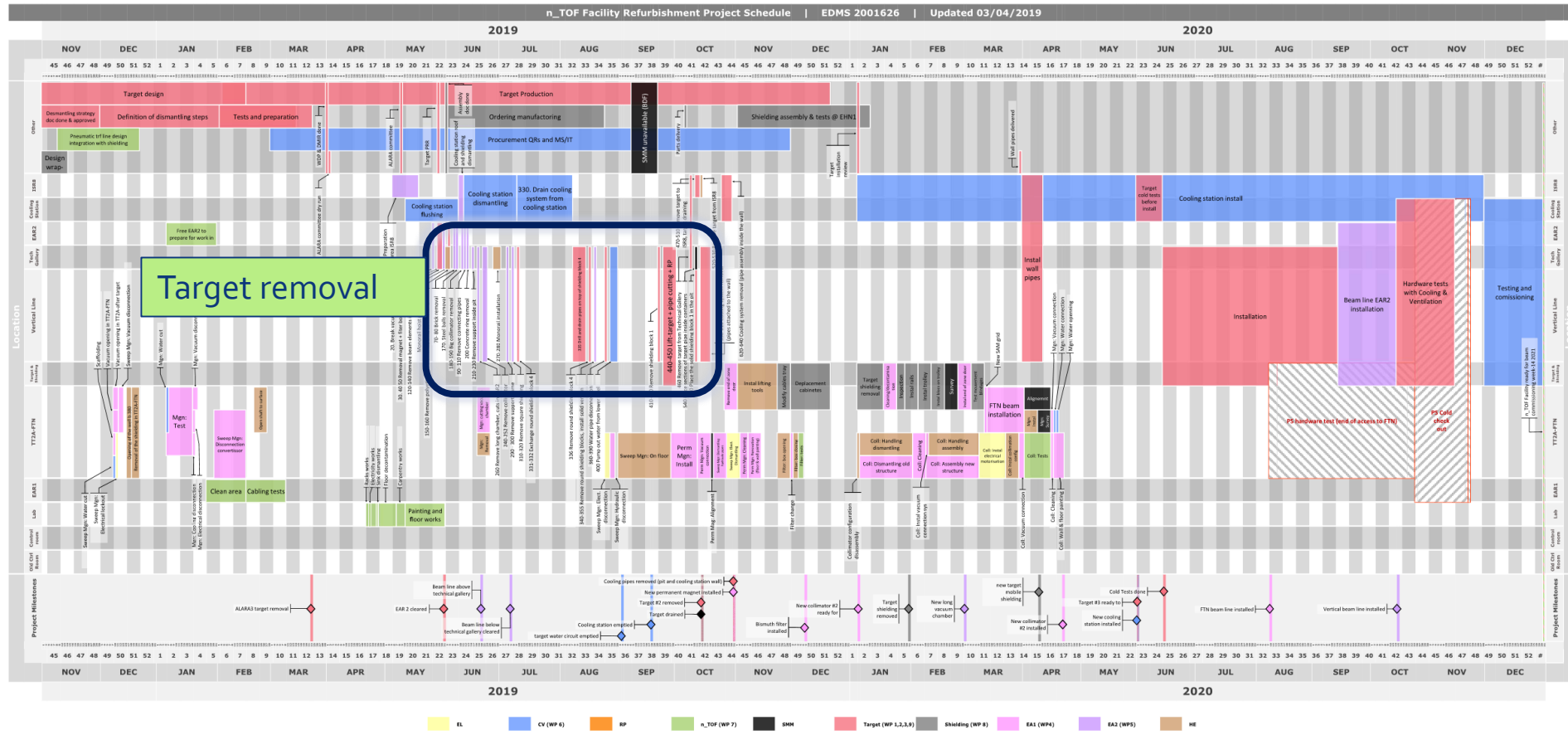


Ge detector mechanical structure designed ad hoc to hold both the detector and the radioactive source

CERN local team is working on the consolidation of the Silicon Monitor and L6D6 scintillator and on the Germanium detector R&D

Schedule and coordination

- n_TOF Facility Refurbishment Project Schedule: EDMS 2001626





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Thank you