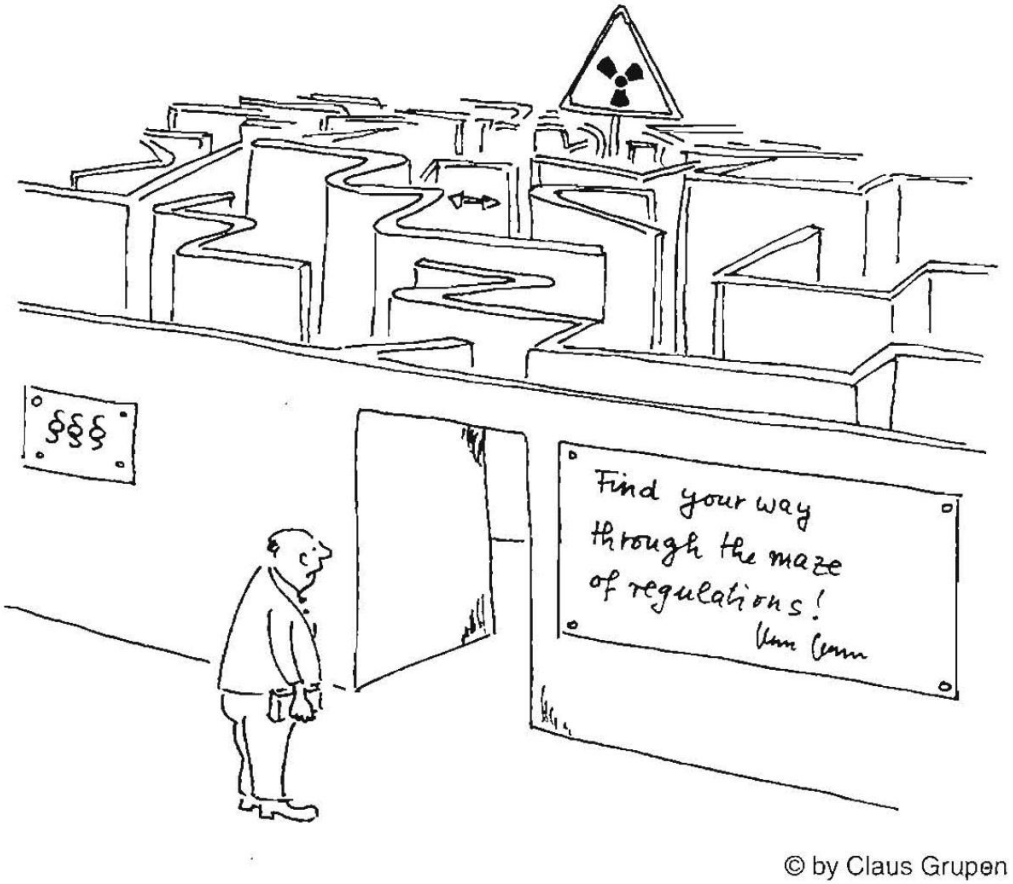
EUROn Safety



Safety workshop

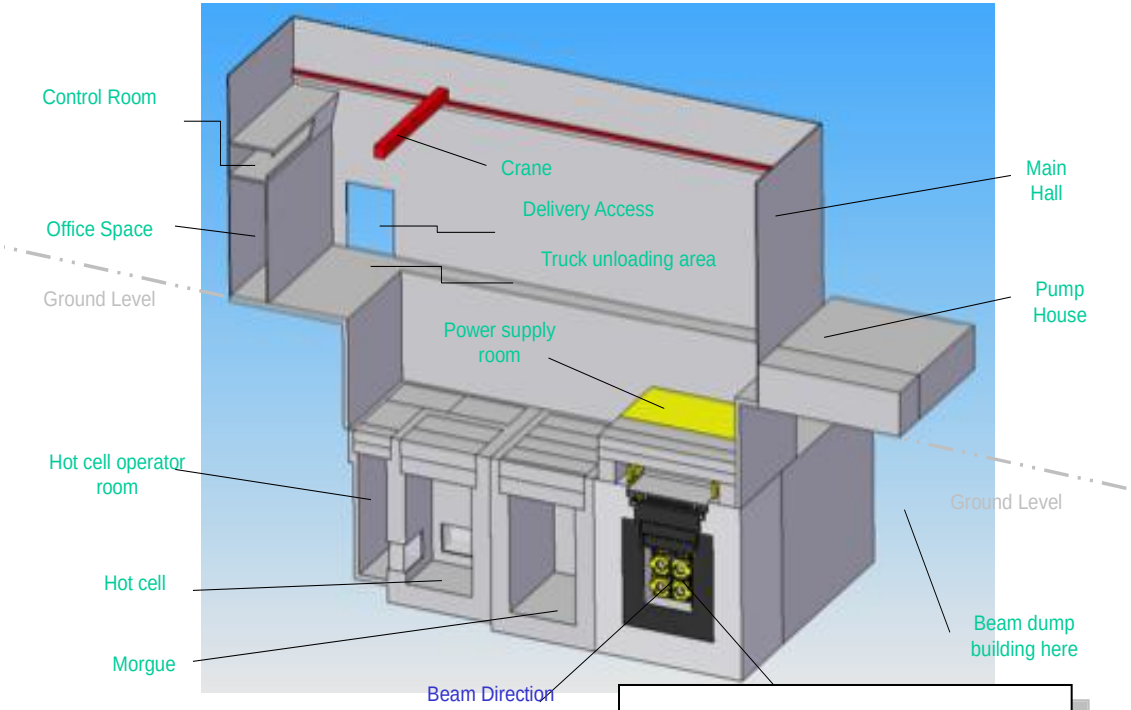
- A first two days safety workshop has been organized at CERN last May (http://indico.cern.ch/conferenceDisplay.py?confId=134751)
  - ~30 participants.
  - presentations:
    - How to include safety in a Design Study: P. Bonnal
    - Safety at J-PARC: Yoshikazu Yamada
    - Safety issues at ITER: John Poole
    - Safety for SPIRAL II: Erwan Pichot
    - Safety at ESS: Thomas Hansson
    - Safety for SNS: S. Trotter
    - Experience from CNGS: Ans Pardons
    - Safety regulations at Fermilab: Mike Andrews

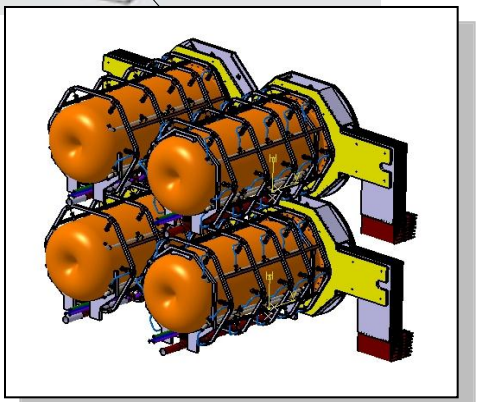
+ EUROnu presentations

WP2 (Super Beam)

Structure of the Building:

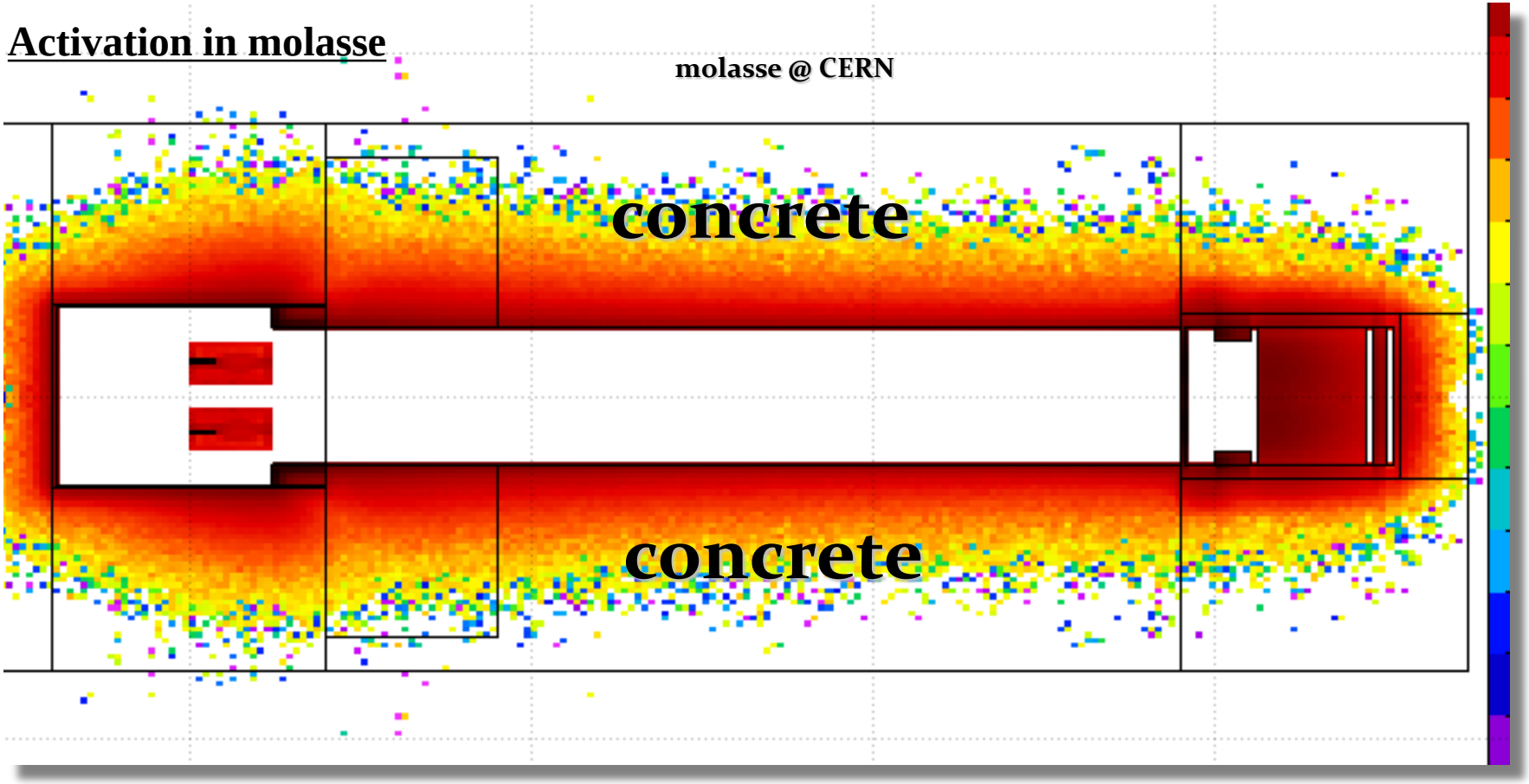
- Proton Driver line
- Experimental Hall
  - MW Target Station
  - Decay Tunnel
  - Beam Dump
- Maintenance Room
- Service Gallery
  - Power supply
  - Cooling system
  - Ventilation system
- Waste Area





WP2 (Super Beam)

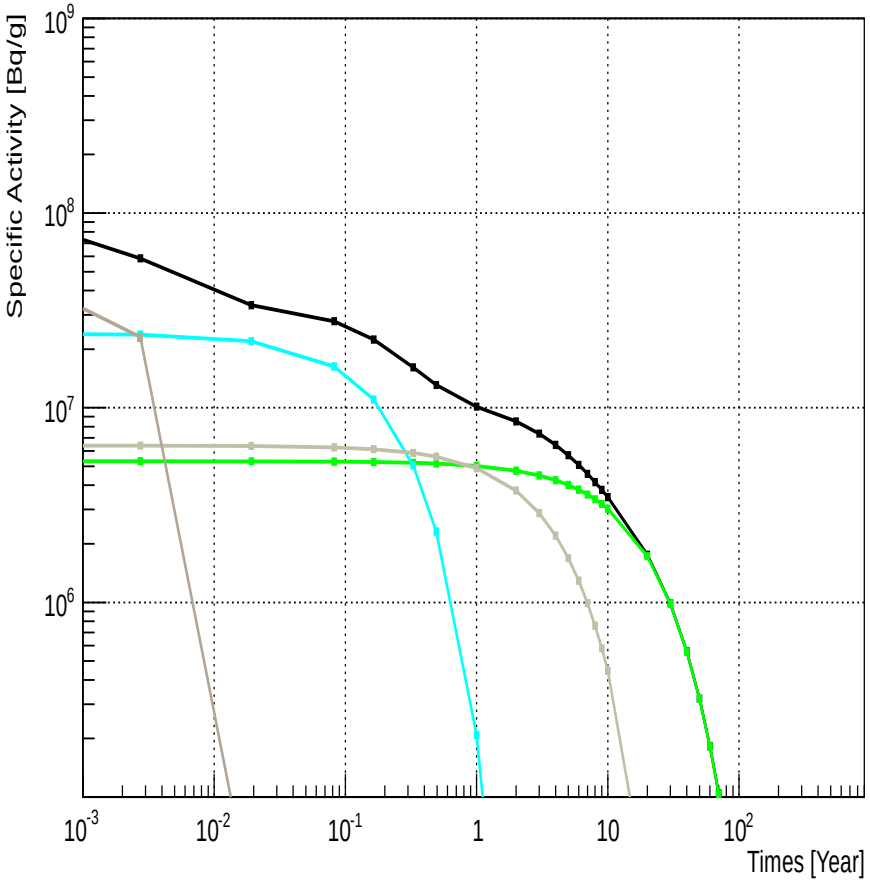
Activation in molasse

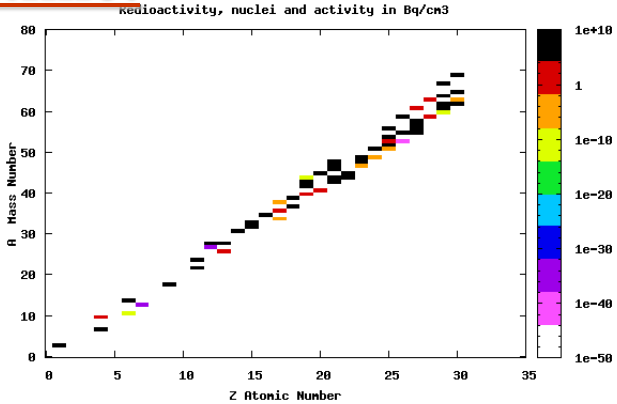


of all the radionuclide's created ^{22}Na and tritium could represent a hazard by contaminating the ground water. Limits in activity after 1y=200days of beam:

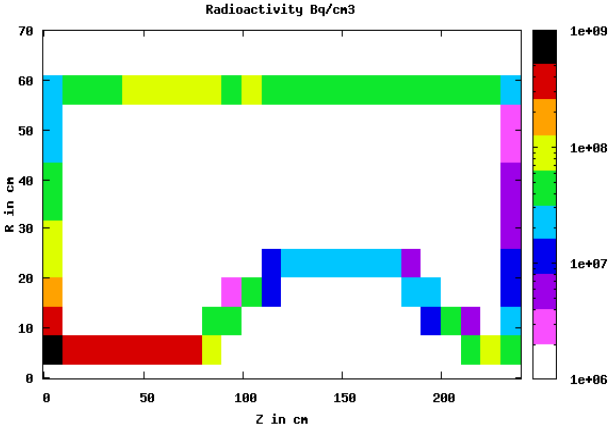
WP2 (Super Beam)

Evolution of the horn activity with cooling time:



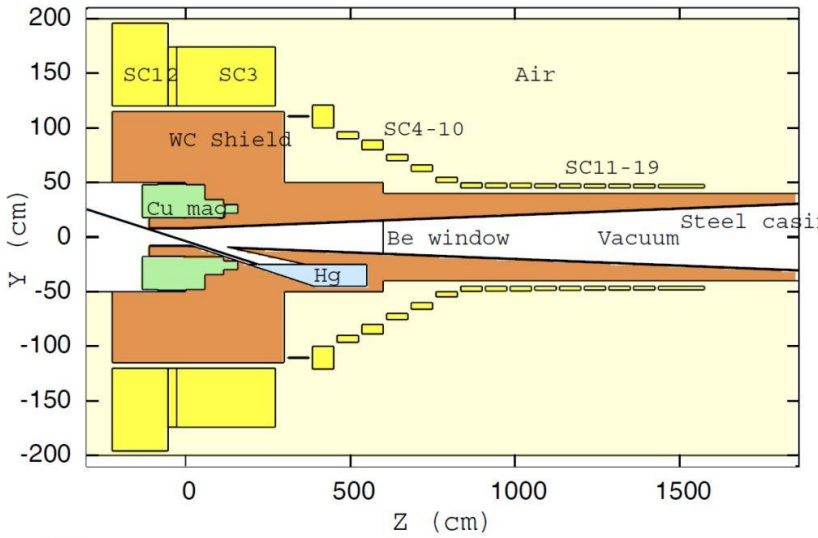


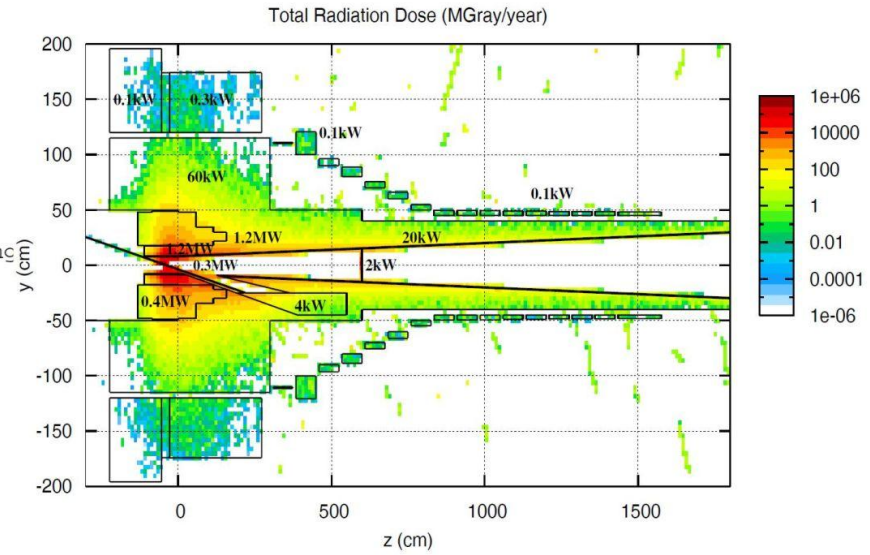
Radionucleides after 1 day (Z,A)

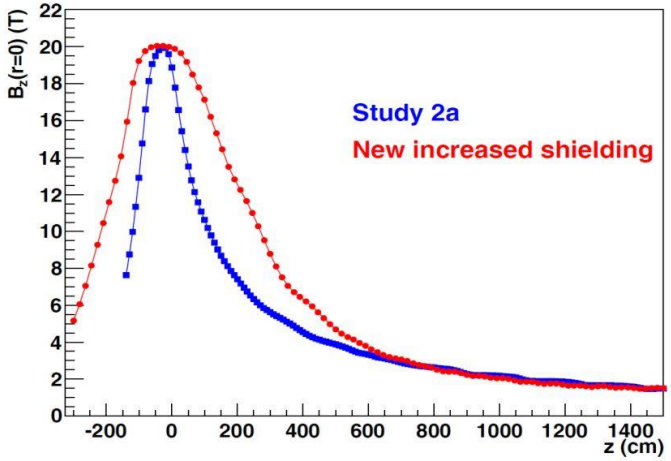


Radioactivity after 1 day (Bq.cm^{-3})

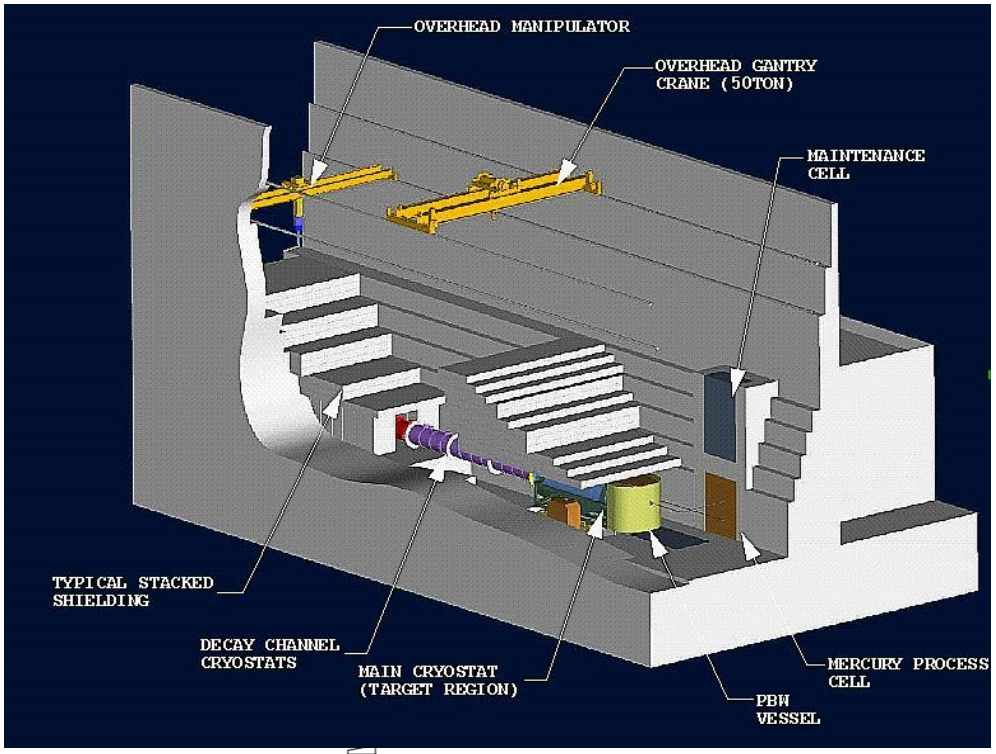
WP3 (Neutrino Factory)

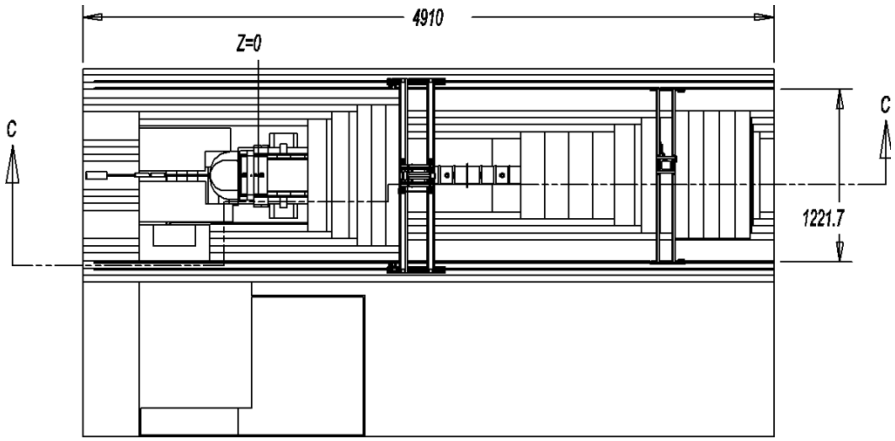


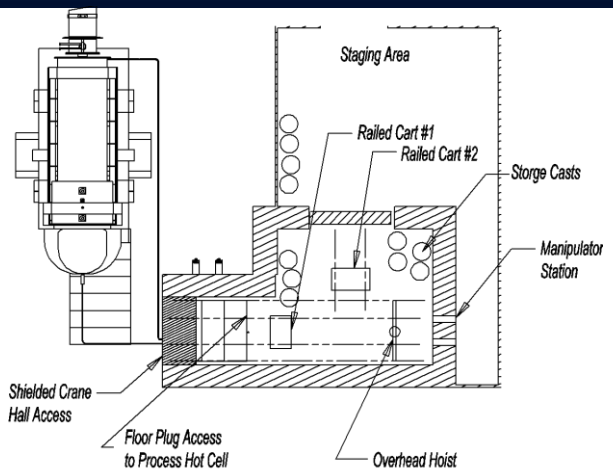




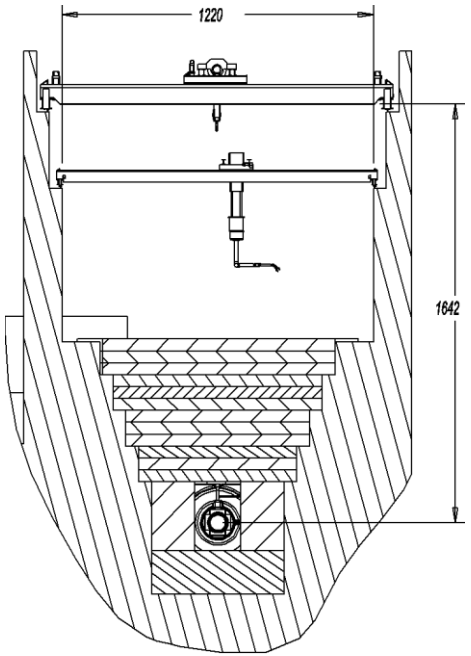
WP3 (Neutrino Factory)







Maintenance Cell Section A-A



SECTION B-B
DECAY CHANNEL SHIELDING

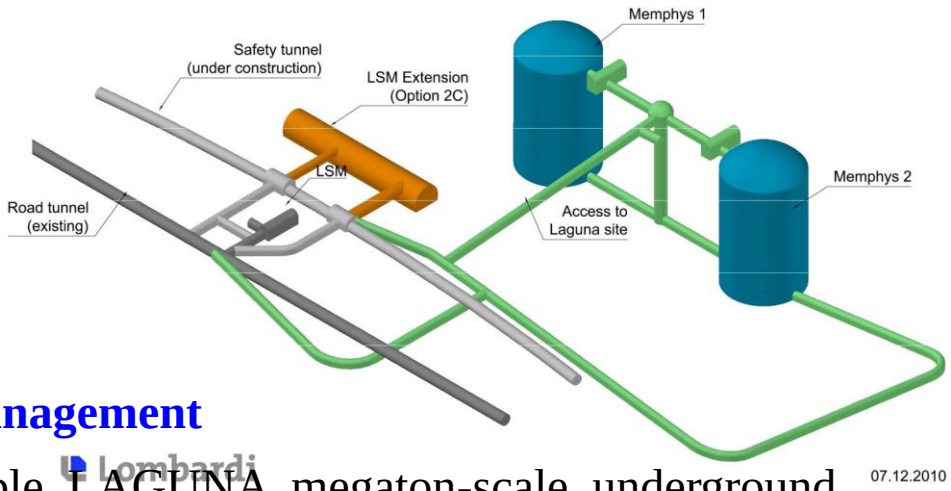
WP4 (Beta Beam)

Production
- Production Source
- Production Linac
- Ion Production (ISOLDE-like)
- Ion Production Ring
- Collection + ECR Breeder

Accel + Storage
- Linac
- Transfer lines
- RCS
- PS & SPS (existing CERN machines)
- Decay Ring

WP5 (Detectors)

MEMPHYS



Overview health and safety culture and management

•The existing laboratory (and also a possible LAGUNA megaton-scale underground laboratory close by) benefits from the entire safety infrastructure settled-up by the operator of the road tunnel.

•The safety management is the responsibility of the GEF (Groupement d'Expoiltation du Frejus) which is a common operator resulting from the two Fréjus tunnel companies: SFTRF (French) and SITAF (Italian).

•The road tunnel safety teams are operational 24/24 hours and 7/7 days.

•The existence, in a near future, of the safety tunnel (8 meters in diameter) will provide a very safe horizontal and independent access to the laboratories.

•The goal is to have zero accidents in all these infrastructures. For that, the relevant equipment is at the top level and the rules of safety to respect are very stern and have as objective to protect both people and facilities.

WP5 (Detectors)

MEMPHYS

Construction phase I: rock excavation

- All risks must be assessed, tested, and efficiently mitigated.
- Excavation operations will be achieved by competent enterprises that will respect all norms and rules for underground works.
- A particular attention will be carried to the reinforcement of the rocks with the progression of the excavation.
- For each detector module, the excavation of the cavern dome is performed in successive steps by drill and blast. During the excavation, a preliminary support is installed (shot concrete and systematic rock bolts).
- The deepening of the cavern can thus start by proceeding from top to bottom. The stability is improved with systematic pre-stressed strand anchors.
- The access to the site will be possible without crossing of the trucks by using the road tunnel to enter and the safety tunnel to leave. This will permit a better safety of the staffs in case of emergency evacuation.
- The ventilation of the site will be done by the safety tunnel himself, estimated fresh air flow at present is of 35 to 50 m^3/s. It will be planned an independent sheath for the extraction of the spoiled air (2 to 2.5 meters of diameter)

WP5 (Detectors)

MEMPHYS

Construction phase II: tank construction and outfitting

- The water upper level in the tank will be lower than all the access and technical installations.
- For the moment only Technodyne Ltd has studied the tank, while the Lombardi Company investigated the interface between the tank and the rock.
- Special attention should be paid to the transport and handling underground of bulky items.
- Concerning the seismic risk, the Fréjus site is located in a region classified with a low seismic hazard.

What to include in the final report

- For each relevant section:
  - subsection with safety issues
    - risks
    - can the facility be constructed safely?
    - can the facility be operated safely?
    - can the facility be dismantled safely?
    - implication on the cost