

MERIT Experiment – Status of Activities at CERN

Outline

- Activities in TT2/TT2A
 - Access (material & personal)
 - Beam line modifications
- Cryogenics
- Power supply
- Particle detectors
- Controls and timing
- Safety

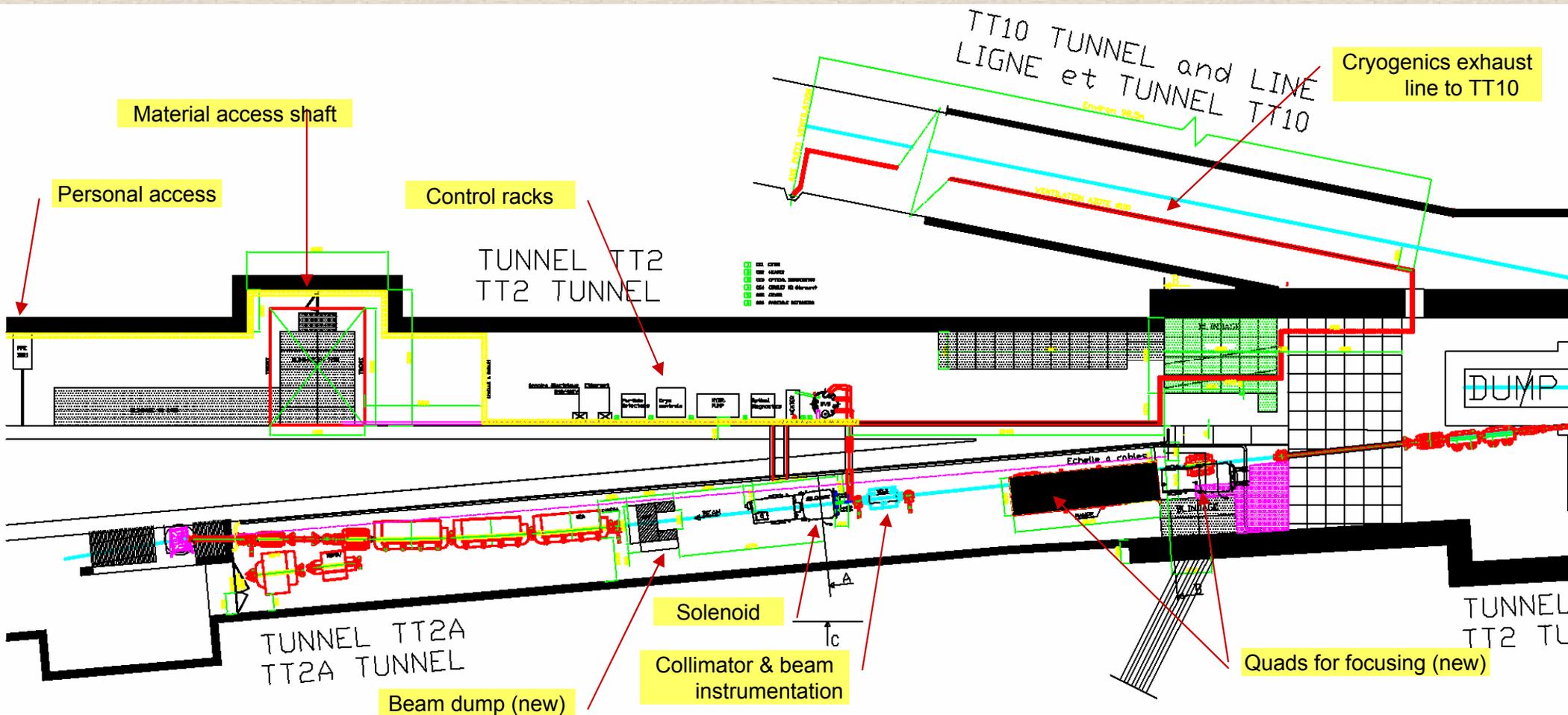
I.Efthymiopoulos, A. Fabich
(for the CERN team)

<http://cern.ch/merit>

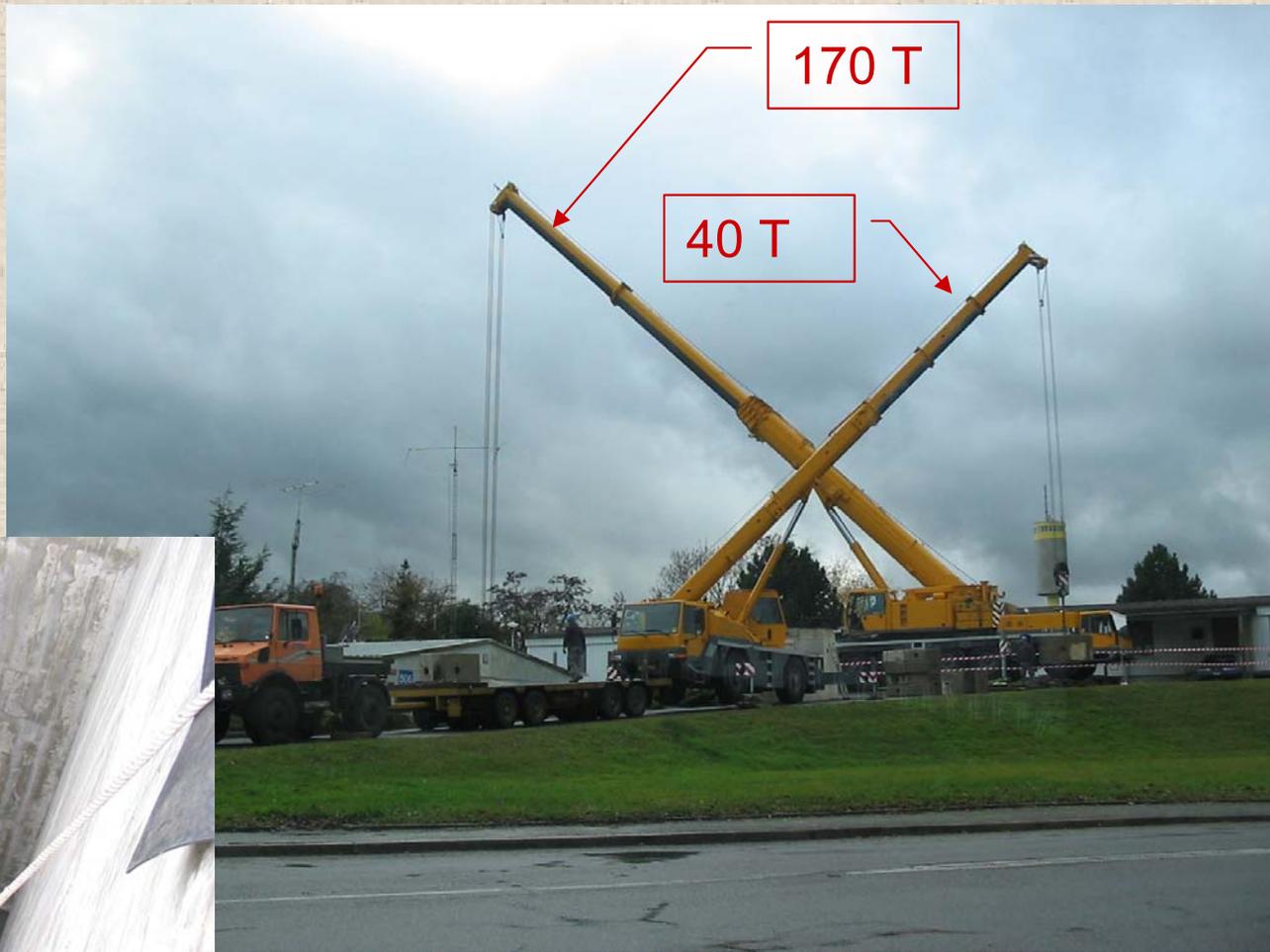
Collaboration meeting
January, 2007

MERIT installation in TT2/TT2A

- Located in the **TT2A tunnel** upstream of the nTOF target



Opening of TT2 shaft



November 22, 2006

General services

- Material access (<500 kg)
 - For light material a hoist is installed at the person entrance. Allows transport of material without using the 170 ton crane.

- Electrical power installation
 - CERN TS/EL is providing
 - 220V for racks, controls, cameras ...
 - 400 V for hydraulic pump of Hg loop and cryogenic heater
 - To be finished by Mid Feb 2007

- Installation of personnel access door
 - With interlock features to
 - Proton beam
 - Power supply of solenoid



... Dismounting of FTN line



- TT2A ready for arrival of solenoid and mercury loop.



Tests with transport equipment



- Tests with dummy load (~6 tons) to test if the tractor and trailer can cope with the 7% slope
- Detailed study of the transport scheme ongoing



Drilling between TT2 and TT2A

View from TT2



Drilling to shorten the cable length between racks and TT2A

- In spite of many unexpected difficulties the three holes are now completed
- A SS tube is inserted in each hole

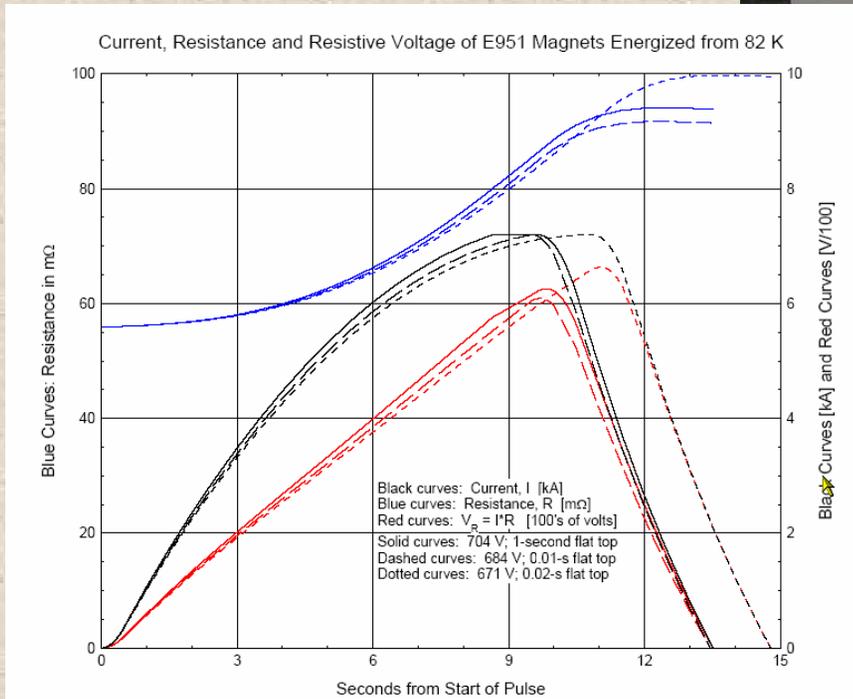


View from TT2A



Detail of large hole – stones between the concrete walls

Status – Refurbishment : Power supply



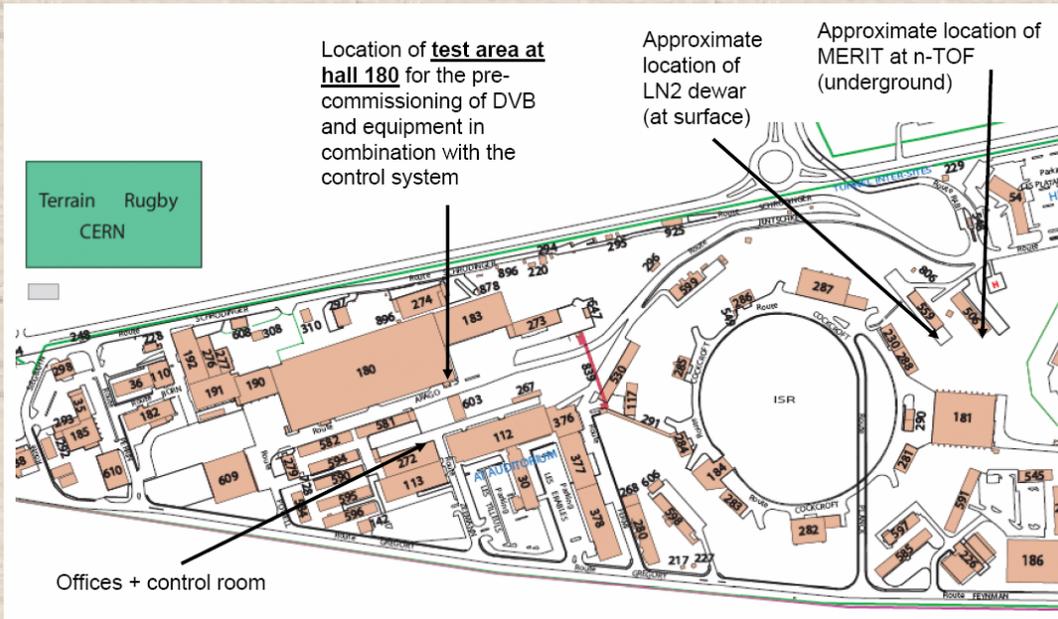
- Recuperate the power supply used for the SPS extraction to the West Area
- “pulsed” mode: 7kA / 30 min ; 5MW
- Installed (along with its transformer) in bat 193
- Refurbishment to convert it to PS standards ongoing (AB/PO) and controls (AB/CO)

- READY for operation: to be tested with controls**

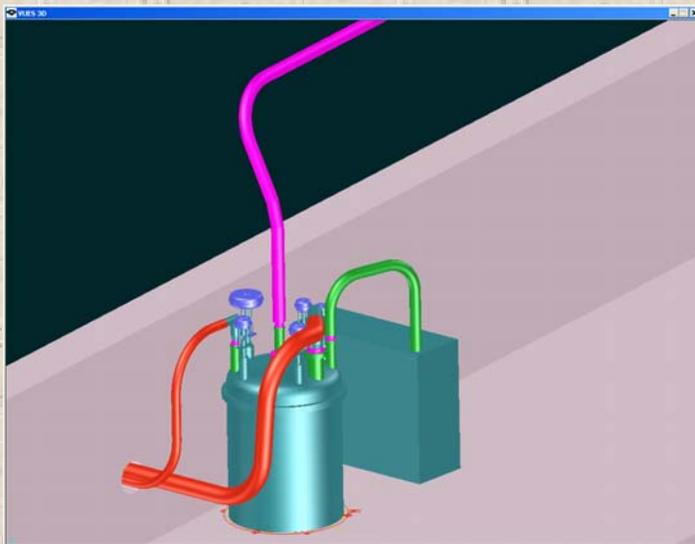
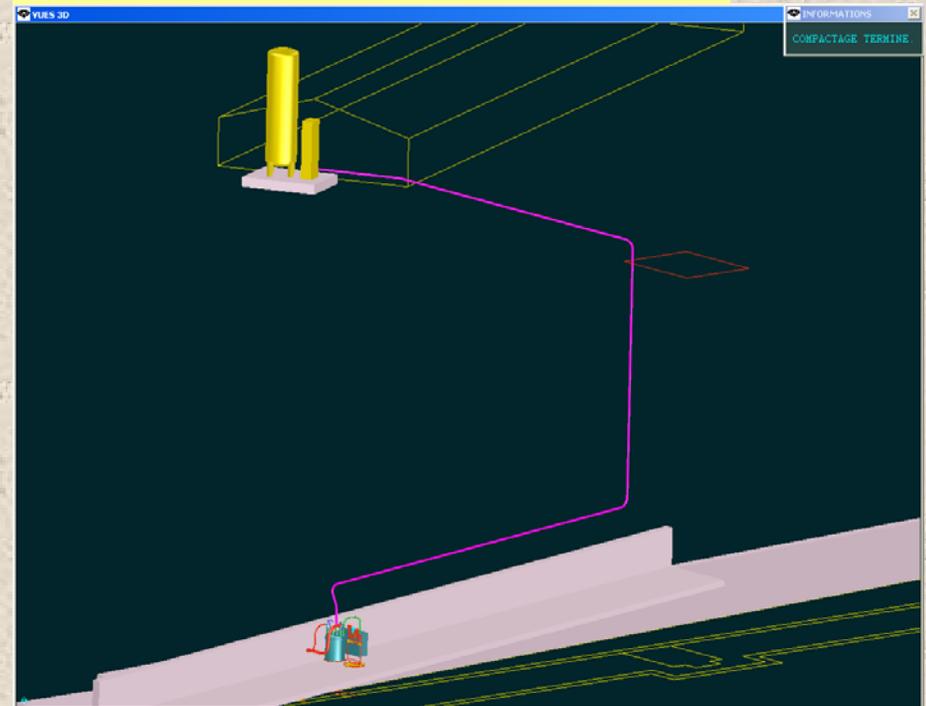
G. Le Godec, CERN

Status – Construction : Cryogenics

F. Haug, CERN



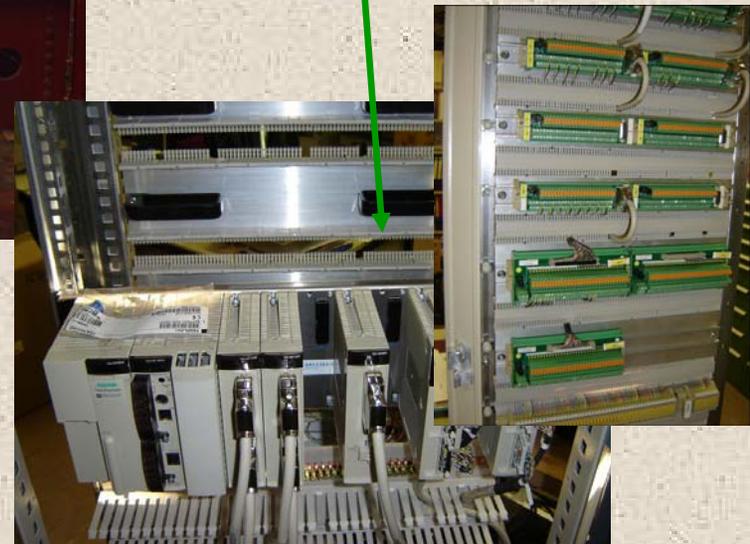
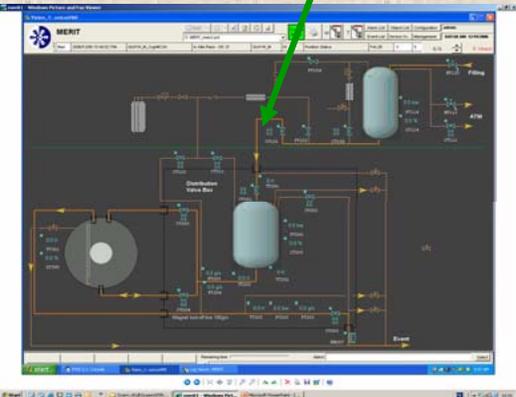
MERIT Cryogenics installation layout



- N2 (gas) Exhaust pipe to TT10 already installed

Cryogenics

- Ready to use: Dewar, heater, DVB, control valves, electronics, GUI



- Electrical wiring ongoing.
- Surface test in two weeks from now.

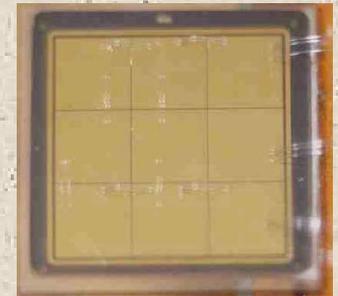
Particle detectors

M. Palm, CERN

□ pCVD Diamonds

(Poly-crystalline chemical vapor deposition)

- Same principle as PIN-diodes; charged particles creates e-h pairs in a reverse biased detector, but:
 - ...fewer e-h pairs/MIP. The expected high currents in a PIN-diode would reduce accuracy in read-out.
 - ...diamond detectors tested and reliable when exposed to MERIT equivalent particle fluxes.
- 6 detectors ordered for MERIT
 - 1 cm² detector area



□ ACEM – Aluminum Cathode Electron Multiplier

- Functions as a regular PM but with an aluminum foil as cathode.
- use very low gain in MERIT
- Tested in hadron and electron extraction beams from SPS with expected results.
 - Testing in more intense beam planned.
- Sensitive to magnetic fields.
 - μ -metallic shielding tested in dipole magnet and satisfying.
 - Additional iron cover under construction.
- 4 ACEMs will be used in MERIT as backup for the diamonds.



Controls & timing

□ Controls

- For mercury loop: action ORNL
- For optical diagnostics: action BNL
- For cryogenics: CERN AT/EGR
- For power supply: CERN AB/CO
- For particle detectors: CERN AB/ATB

Controls layout and necessary communication between cryogenics and power supply are defined. CERN standards are used to ease implementation.

The mercury loop, the particle detectors and the optical diagnostics are - in terms of safety - no critical items and are not included in the interlock chain.

□ Timing

CERN will provide a trigger signal to all subsystems in the place of TT2 (racks). It is the responsibility of each system to connect to this trigger signal (hard-wired).

Safety & commissioning

1. Preliminary hearings with safety officials at CERN before the proposal submission and approval of the experiment

2. Safety reviews of the major sub-systems of the experiment, in time with their production

Cryostat and cryogenics – **February 3, 2006**

Hg-system – **June 20, 2006**

3. Follow-up of previous safety reviews

After the combined tests at MIT → **~February/March '07**

4. Safety review of installation procedures

Installation & dismantling

March '07

5. Safety inspection of the final installation in situ

Transport, installation

Access, interlocks, ODH system verification, ...

Summary

- TT2A ready for reception of mercury loop and solenoid.
- Tests with one candidate detector for the particle flux monitoring successful – backup solution verified. Second particle detector type in preparation.
- Cryogenics surface test in two weeks from now.
- CERN installation on schedule with the support from
 - TS/EL group (electrical installations)
 - AT/ECR (cryogenics)
 - AB/CO (controls)
 - AB/PO (power supply)
 - TS/CE (civil engineering)
 - TS/IC (transport)
 - AB/ATB (infrastructure)