

FAIR test station B180

# Organization of the CERN/GSI Collaboration

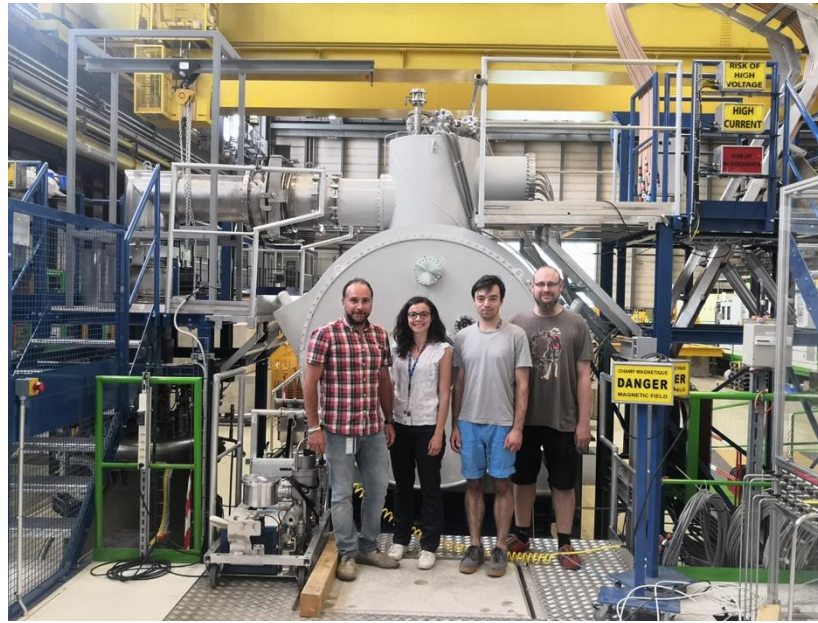
Status 03.07.2019

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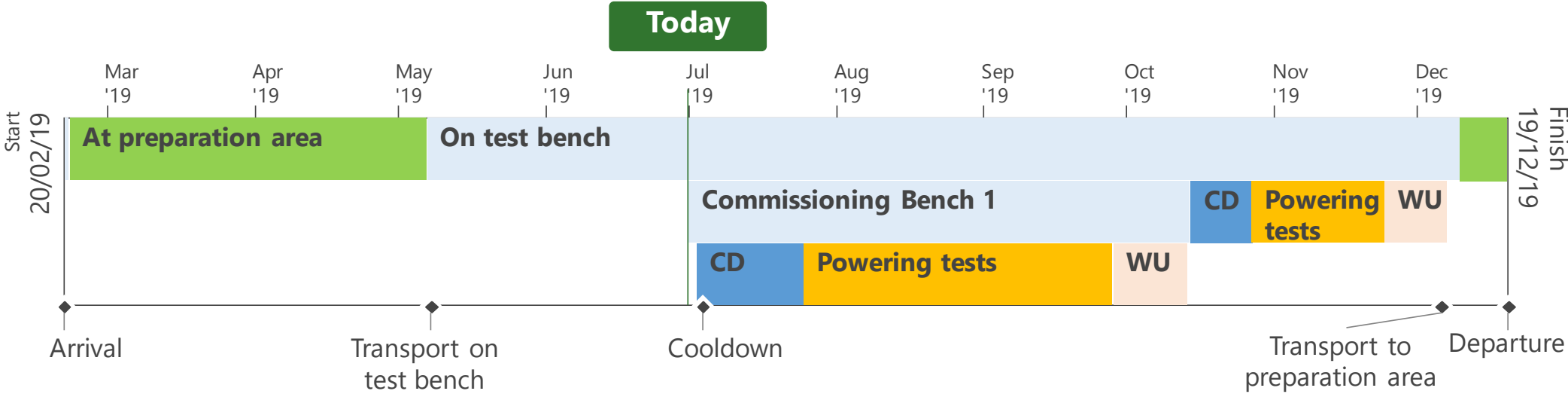
# Contents

A birds-eye view on

- Test plan status
- Organizational matters
- Resources



# Status (1)



**New facility  
New magnet  
New instrumentation  
New team**

**FoS testing and  
commissioning of the facility  
in parallel (only for bench 1  
– so far)**

# Status (2)

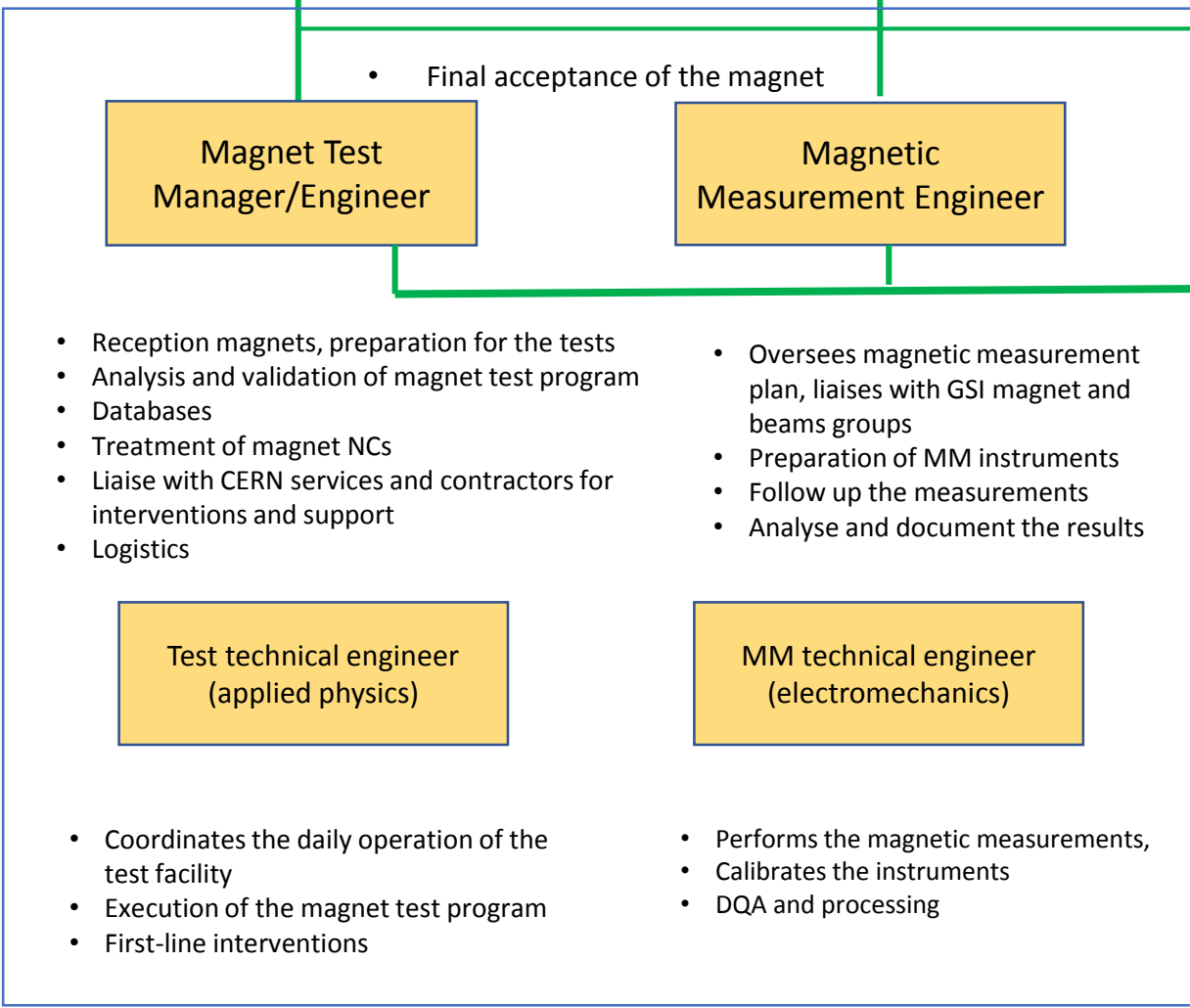
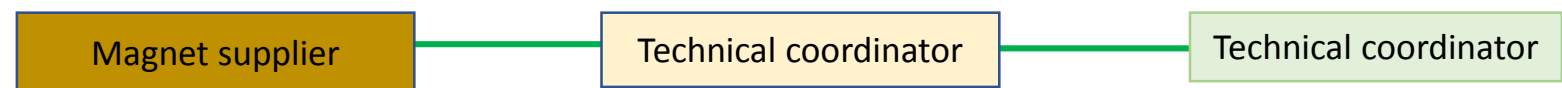
- Deployment of the GSI personnel (4 FTEs) was completed by beginning of February 2019.
- First short multiplet arrived in Feb 2019. Therefore no training on the SM18 test station.
- Non-conformities on magnet and installation, adaptations, additional tools and equipment needed.
- Commissioning of GSI Instrumentation Panel and Electrical Cabinet (hardware, DAQ, and control software) required before the cooldown can start.

## Activities and Milestones (more detailed, so far)

<b>Magnet</b>	<b>Resources (issues)</b>	<b>Facility</b>	<b>Resources (issues)</b>
1) Transport	EN-HE-HH + ASG (CoG)	1) Removal platforms	EN-HE-HH + FSU
2) Unwrapping	FSU (Cherry picker, safety training)	2) Platform adjustments	EN-HE-HH
3) Feet installation and alignment	FSU + GSI@CERN (NC)	3) Install brackets (for survey)	EN-SMM-ASG
4) Installation of safety valve	FSU (NC)	4) Piping for current leads	Contractor
5) Jumper alignment	EN-MME-FW	5) Cabling instrumentation panel and electrical cabinet	GSI@CERN
6) Jumper welding	EN-MME-FW (NC)	6) HSE inspection	HSE-OHS-IB
7) Insulation vacuum	Contractor	7) QDS cable integrity	TE-MPE-EP
8) Cold mass survey	GSI survey	8) Commissioning facility	TE-MPE-MS/MS-C-TF/
9) Removal transport rods	FSU + GSI@CERN (Info, cold-mass displacement)	9) Commissioning electr. cabinet and instrument. panel	EPC-MPC GSI + GSI@CERN
10) Leak tests (Jumper, LHe vessel + IP)	Contractor		
11) Purging	TE-CRG-OP		
12) Electrical tests	TE-MS-C-TF + GSI@CERN		

Estimated 0.3 FTE for FoS, not including MM proper

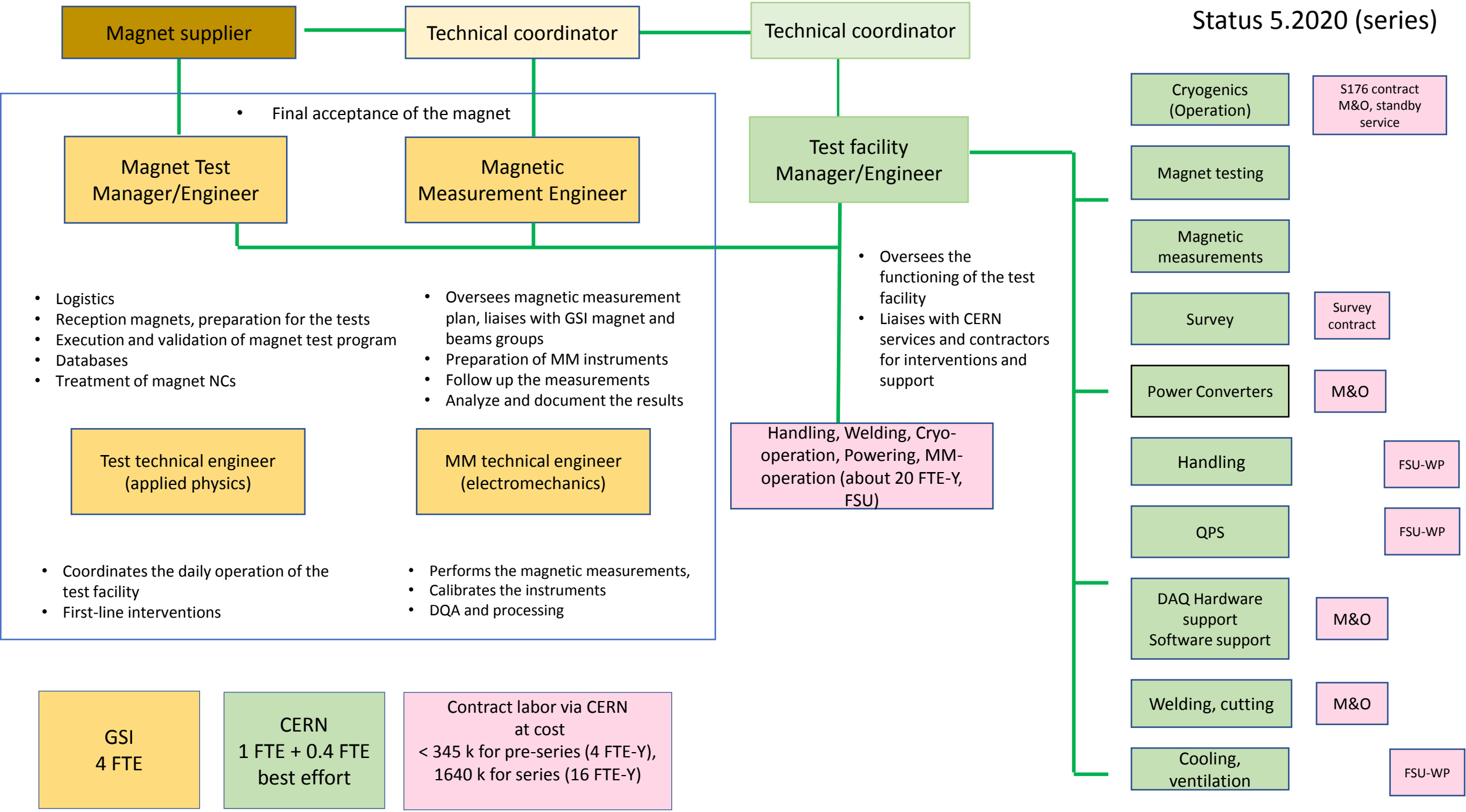
Status 7.2019



Budget	
Cryogenics (Operation)	S176 contract M&O, standby service
Magnet testing	FSU-WP
Magnetic measurements	FSU-WP
Survey	Survey contract
Power Converters	M&O
Handling	FSU-WP
QPS	FSU-WP
DAQ Hardware support Software support	M&O
Welding, cutting	M&O
Cooling, ventilation	FSU-WP

GSI 4 FTE	CERN 1 FTE + 0.4 FTE best effort	Contract labor via CERN at cost < 345 k for pre-series (4 FTE-Y), 1640 k for series (16 FTE-Y)
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# Status 5.2020 (series)



Magnet supplier

Technical coordinator

Technical coordinator

Magnet Test Manager/Engineer

Magnetic Measurement Engineer

Test facility Manager/Engineer

Test technical engineer (applied physics)

MM technical engineer (electromechanics)

Handling, Welding, Cryo-operation, Powering, MM-operation (about 20 FTE-Y, FSU)

Cryogenics (Operation)

Magnet testing

Magnetic measurements

Survey

Power Converters

Handling

QPS

DAQ Hardware support  
Software support

Welding, cutting

Cooling, ventilation

S176 contract M&O, standby service

Survey contract

M&O

FSU-WP

FSU-WP

M&O

M&O

FSU-WP

- Final acceptance of the magnet

- Logistics
- Reception magnets, preparation for the tests
- Execution and validation of magnet test program
- Databases
- Treatment of magnet NCs

- Oversees magnetic measurement plan, liaises with GSI magnet and beams groups
- Preparation of MM instruments
- Follow up the measurements
- Analyze and document the results

- Oversees the functioning of the test facility
- Liaises with CERN services and contractors for interventions and support

- Coordinates the daily operation of the test facility
- First-line interventions

- Performs the magnetic measurements
- Calibrates the instruments
- DQA and processing

GSI  
4 FTE

CERN  
1 FTE + 0.4 FTE  
best effort

Contract labor via CERN  
at cost  
< 345 k for pre-series (4 FTE-Y),  
1640 k for series (16 FTE-Y)

- Transport and crane operation
- Installation of support posts
- Transport rods removal
- Supervision and maintenance of cryogenic installation
- Magnet connection to cryogenic interfaces
- Parameter configuration
- Configuration setting for each magnet
- Commissioning of powering system
- Safety instructions for the facility operation
- Safety files
- Safety inspections
- Configuration setting for each magnet
- Commissioning
- Interfacing with power converters and interlocks
- Verify interlock system
- System calibration and maintenance
- Installation of optical target on the magnet
- Magnet alignment at test bench
- Magnet fiducialization

Handling

Cryogenic operation

Electrical/Powering Test

Welding

Power Converter

Safety

Modelling/Integration

QPS

Cryogenic control system

Magnetic measurement support

Survey

Vacuum

Test facility coordination

Test activities coordination

Cold mass  
mouvement survey

Resource loaded  
planning

Test and  
measurement plan

Electrical and  
powering tests

Magnetic  
measurements

Cryo-  
Instrumentation  
and DAQ software

Controls of current-  
lead cooling circuits

- Define test plan
- Interact with magnet producer
- Follow up of delivery
- Cabling and connection of instrumentation rack to the magnet
- HV tests
- DAQ
- RRR measurements
- Continuity testing
- Inductance/AC losses
- Sensor integrity
- Commissioning of SSW and Rotating Coil
- Development of analysis software
- Magnetic measure axis/angle/main field
- Measure field quality
- Instrument calibration
- Cold mass survey
- Test and measurement data validation and dissipation
- Magnet approval



CERN staff, fellows

Serge Pelletier	Handling EN HE-HH (S. Pelletier)
Thierry Dupont	Cryogenic operation TE-CRG-ML (G. Ferlin)
G. Rolando	Cryogenic eng. support TE-CRG-ME (A. Perin)
Maryline Charrondiere	Electrical/Powering Test TE-MS-C-TF (M. Bajko)
Gilles Favre	Welding EN MME-FW (G. Favre)
Hughes Thiesen, Emilien Coulot	Power Converter TE EPC-MPC (G. Le Godec)
Andre Henriques	Safety HSE OHS-XP (S. La Mendola)
Antoine Kosmicki	Modelling/Integration EN-ACE-INT (Y. Muttoni)
Jens Steckert, Daniel Calcoen	QPS TE MPE-EP (R. Denz)
Thomas Barbe	Cryogenic control system TE CRG-CE (M. Pezzetti)
Guy Deferne	Magnetic measurement support (TE-MS-C-MM) (S. Russenschuck)
Patrick Bestmann	Survey (Fidualization) EN-SMM-ASG (D. Missiaen)
Jaime Perez Espinos	Vacuum TE-VSC-DLM (C. Garion)

Test facility coordination

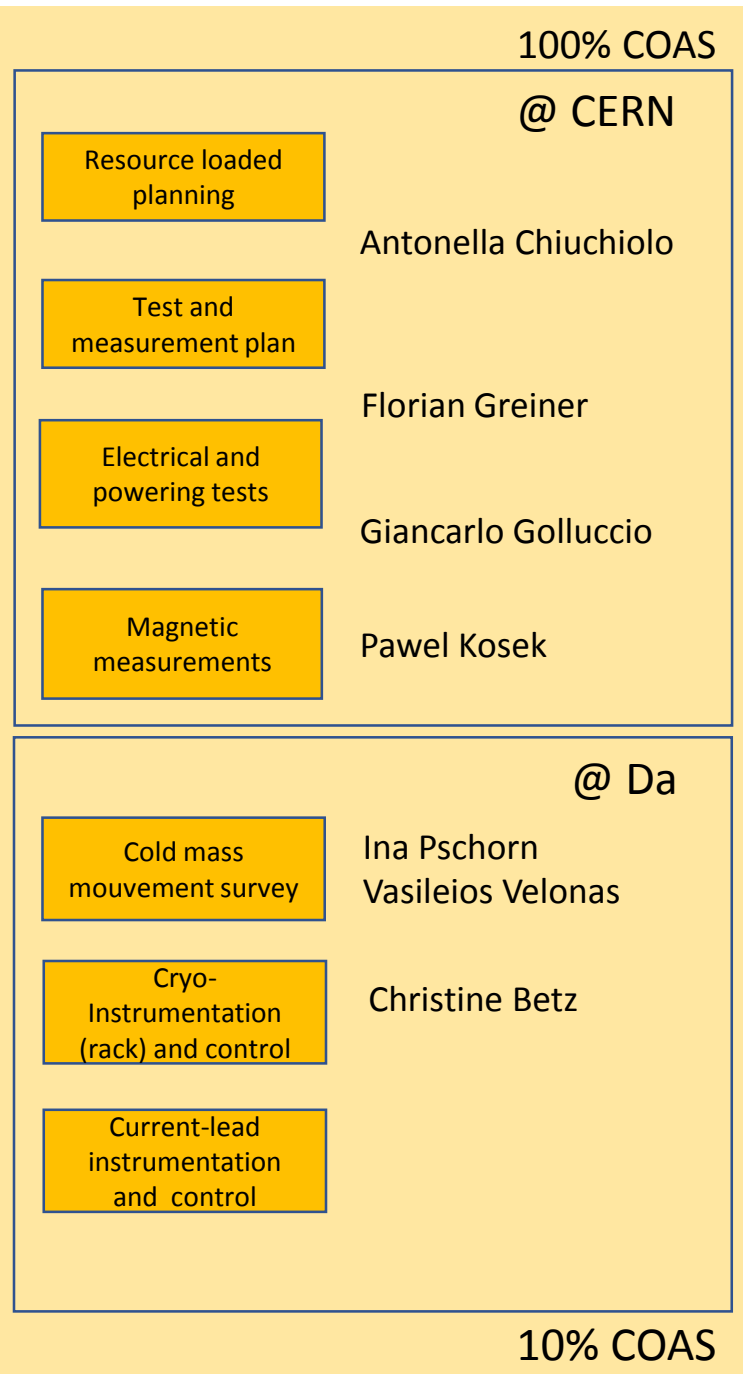
Collaboration (S. Russenschuck)

Magnet suppliers and their contractors

Test activities coordination (Kei Sugita)

SuperFRS project (Haik Simon, Martin Winkler)  
Magnets (Hans Mueller, Eun Jung Cho)  
Quench detection (Piotr Szwangruber)  
Powr supplies (Alexander Wiest)  
Cryogenics (Christine Betz)

10% COAS



100% COAS  
@ CERN

Antonella Chiuchiolo

Florian Greiner

Giancarlo Golluccio

Pawel Kosek

@ Da

Ina Pschorn  
Vasileios Velonas

Christine Betz

10% COAS

# Points needing attention

- According to the addendum: CERN provides and operates the test station, GSI is responsible for all the testing. But there are some «gray zones», for example the cryo-instrumentation (hardware, DAQ, and controls), fixing of non-conformities on the magnets, safety coordination (co-activities, in particular when magnets are on three benches), coordination of FSU and contractors.
- So far, most cost-efficient operation, no people hired, no additional FSU, but this will change (experience with FoS multiplets and dipoles needed to establish a resource loaded planning).
- Non-negligible lead time for registration and (safety) training (COAS, Proj). Magnet suppliers and their contractors need work-orders to be able to intervene on the magnets.