



ENGINEERING  
DEPARTMENT

# Opportunities for future tenders in the Engineering (EN) Department

Rui Nunes on behalf of the EN Dept

20<sup>th</sup> June 2022

# Outline

- **Presentation of the EN department**
  - Mandate
  - Structure
  - Scope - Accelerator complex
- **For each group inside the EN department**
  - Mandate of the group
  - Current opportunities
- **Contact persons**
- **Q&A**

# ENgineering department – Mandate

The Engineering Department (EN) provides CERN with the **Engineering Competences, Infrastructure Systems and Technical Coordination** required for the **design, installation, operation, maintenance and dismantling** phases of the CERN accelerator complex and its experimental facilities.

The activity of the Engineering Department is in the following fields:

- Operation, maintenance and consolidation of infrastructure systems for **cooling, ventilation, transport, handling, electricity, access and alarms**, as well as design and installation of infrastructure systems for the new facilities,
- **Mechanical engineering and materials expertise** for the design, the prototyping, the manufacturing and the assembly of accelerator and detector components,
- **Technical Coordination** for the technical stops and the shutdowns in the accelerators as well as support for projects.

# ENgineering department in the CERN structure

## Structure as of 2021

### Directorate

[CERN's main objectives for the period 2021-2025](#)

#### Director-General

Appointed by Council, usually for five years, **the Director-General manages CERN**. A directorate assists the Director-General, who proposes its members to Council. The Director-General reports directly to the Council, and can also propose any adjustment deemed necessary to meet the evolving needs of the research programme.

[Fabiola Gianotti](#)

#### Director for Finance and Human Resources

[Raphaël Bello](#)

#### Director for Accelerators and Technology

[Mike Lamont](#)

Deputy: Malika Meddahi

ATS - Accelerator & Technology Sector

#### Director for Research and Computing

[Joachim Mnich](#)

Deputy: Pippa Wells

#### Director for International Relations

[Charlotte Warakaulle](#)

### Heads of departments

Site and Civil Engineering

Mar Capeans

Engineering

Katy Foraz

Theoretical Physics

Gian Francesco Giudice

Accelerator Systems

Brennan Goddard

Information Technology

Enrica Porcari

Technology

José Miguel Jiménez

Beams

Rhodri Jones

Experimental Physics

Manfred Krammer

Industry, Procurement and Knowledge Transfer

Christopher Hartley

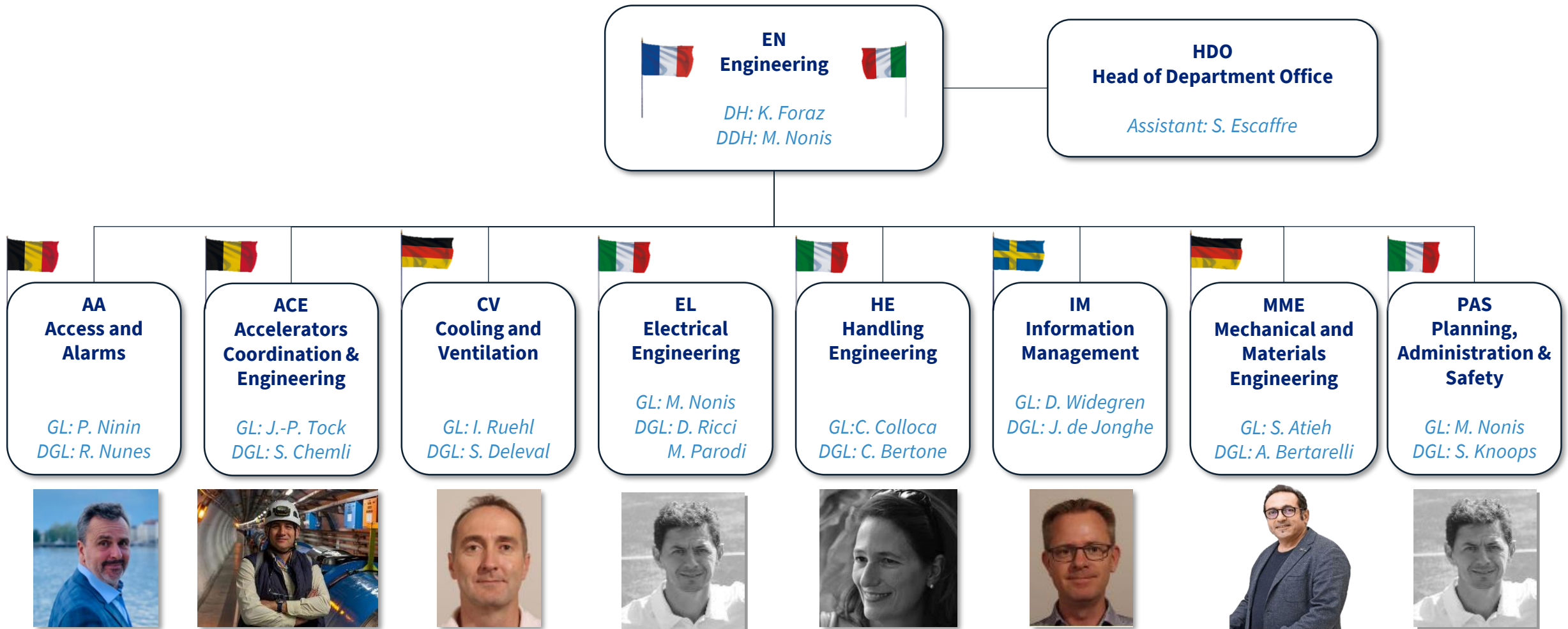
Human Resources

James Purvis

Finance and Administrative Processes

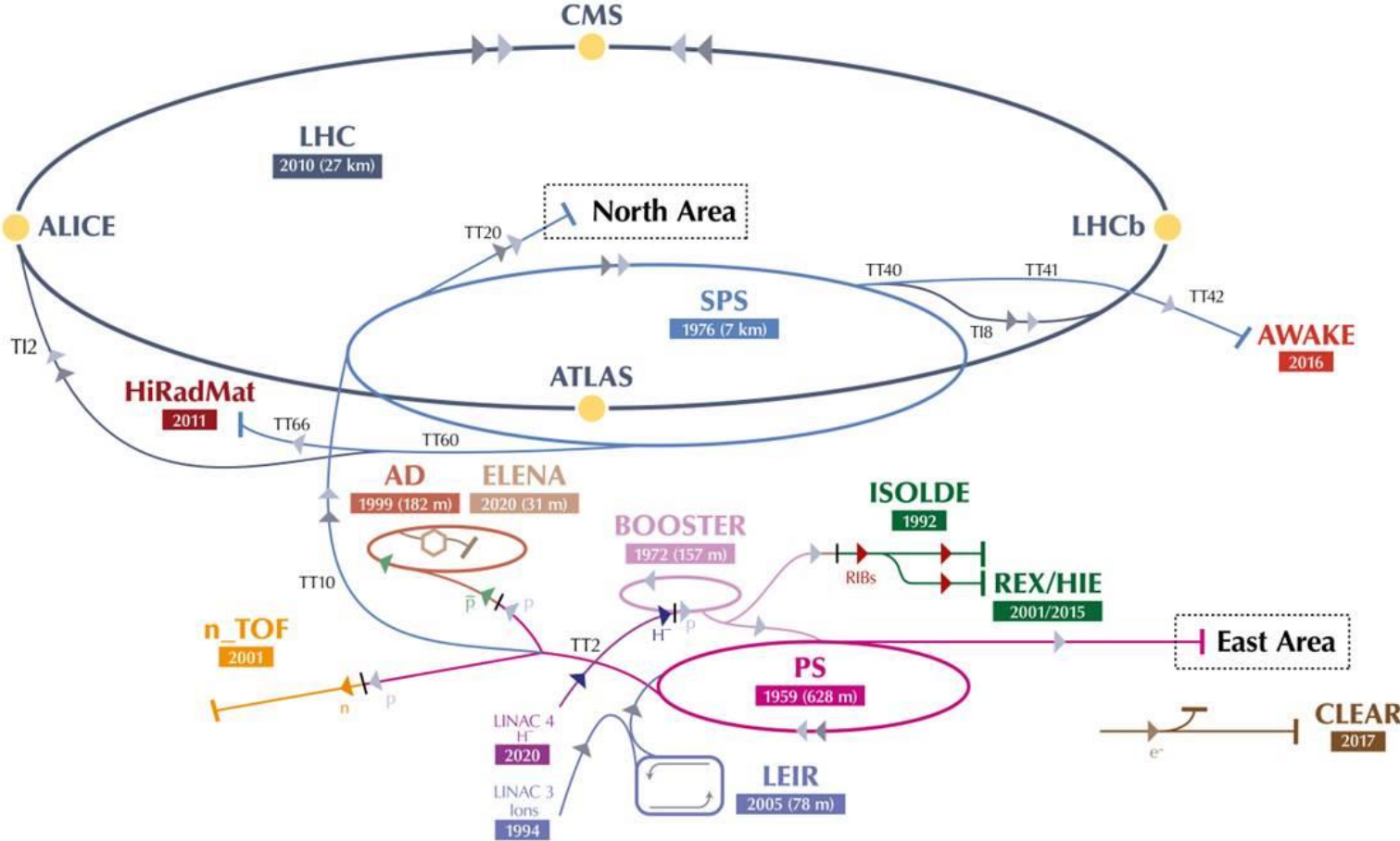
Florian Sonnemann

# ENgineering department - Organigramm



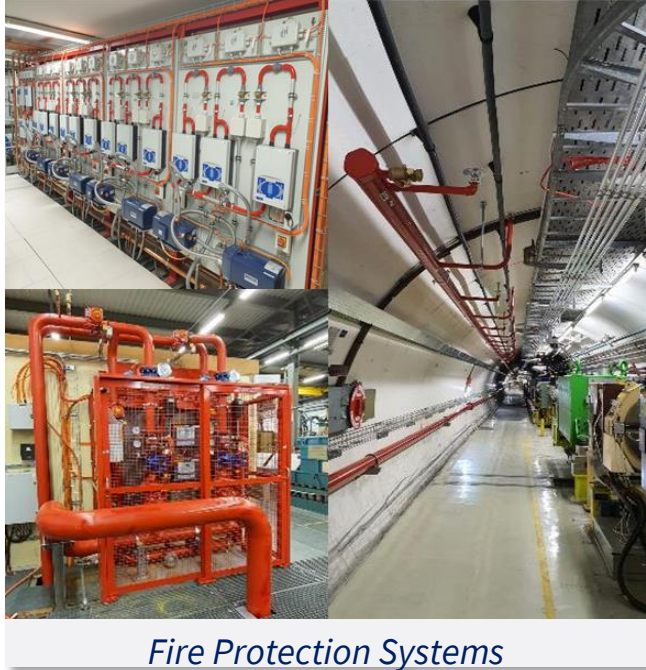
# CERN Accelerator chain

The CERN accelerator complex  
*Complexe des accélérateurs du CERN*





# EN-AA - Access and Alarms



Fire Protection Systems

The AA group is in charge of the conception, design, installation and maintenance of the systems that ensures the Safety of the CERN Personnel, Users and Visitors, on all its site and facilities.

The systems cover:

- *Fire and Gas/ODH detection, emergency phones and evacuation, alarm transmission and monitoring,*
- *Interlocks to protect people from radioactivity, X rays, lasers, electricity and cryogenics hazards,*
- *Access control to all CERN conventional or nuclear facilities and sites,*
- *Video surveillance, protection and intrusion detection,*
- *Access data management applications.*



# EN-AA Alarms and Access : Future contracts

Detail @  
E. Sanchez

Ref:	Scope	MS	IT	Contract Start/End	Remarks	Cost range
IT-4600	<b>Industrial Controls and Safety Systems Supply</b>	Jul-2021	6/2022	Jan-2023 – 2029	Maintenance & projects: upgrade/modify existing systems and supply of new ones covering studies, design, implementation, installation and commissioning. AA, CV, EL controls. O&M interventions mostly @ CERN Requires wide variety of computing skills and strong methodology, compliance with safety standards (IEC5108/11/13), audited by Nuclear Authorities.	D
	<b>CERN Safety Alarms Monitoring Renovation - CSAM2 Phase I &amp; Phase II</b>	tbd	tbd	tbd	1) Hardware replacement of alarm acquisition devices new functionalities for the existing SCADA (PcVue)(*), SPS/LHC alarm and CSAM rack cabling. 2) Replacement of the SCADA - personnel safety alarms (level-3-alarms) and technical alarms.	A B
	<b>LHC &amp; Experiments Automatic Gas and ODH detection systems renewal</b>	2022	Jan 2023	2024-2032	Oxygen deficiency detection, flammable gas and toxic gas detection in LHC. Technology options to be investigated (radiation resistance, EMC). Covers: LHC (renewal) & HL-LHC (new) and maintenance for all CERN sites. Subject to approval to ACC-cons , needed for HL-LHC ODH.	C
	<b>Sniffer system renewal for LHC Experiments (ATLAS, LHCb, ALICE)</b>	On hold	On hold	On hold	Development: detection (smoke, flammable & toxic gas), electronic acquisition card. Cabinets renewal. Depends on the experiment	B
	<b>LHC Evacuation Renewal</b>	On hold	On hold	On hold	Voice alarm system in the LHC (evacuation functions). Compliance with EN54. depending of Experiments.	C

Cost Range :  
A : 200–750k CHF  
B: 750k-5M CHF  
C: 5-10M CHF  
D: > 10M CHF

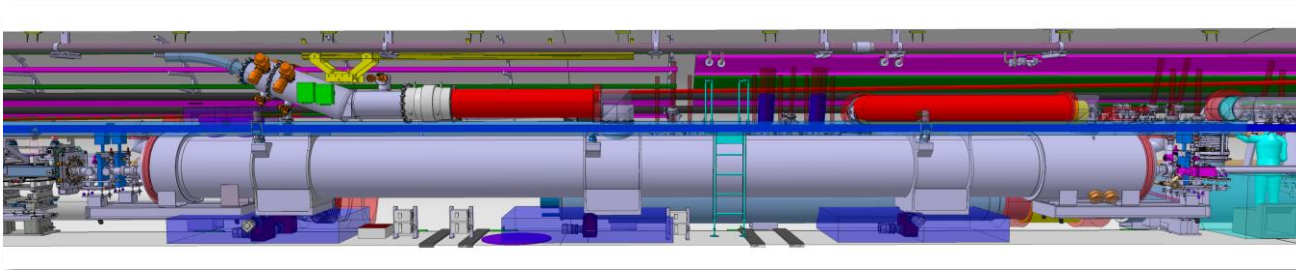
Please refer to up-to-date list on : <https://procurement.web.cern.ch/>



# EN-ACE - Accelerator Coordination & Engineering

**The group is in charge of the coordination of the activities for the interventions and changes to the LHC and its injectors. This includes:**

- Configuration & layout management, including naming service,
- Integration studies and maintenance of the related 3D-CAD representations,
- Organization and scheduling of programmed stops, management of the mid- and long-term schedule,
- Worksites follow-up and management of the LHC sites,
- Management of electrical lock-out in LHC
- Operational safety coordination
- Sector Quality Service, giving support to the stakeholders of the A&T sector.
- support and/or advices in small size works, such as metal frames, Manufacturing, installation and maintenance of doors.



# ACE contracts: upcoming industrial opportunities

Ref.	Contract description	Comments	MS	IT	Contract	Cost range
	Safety coordination (2 - 3 contracts)	Knowledge of Swiss and French rules	Q2- 2024	2024	2025-2032	C

Detail @  
JP. Tock

Cost Range :  
A : 200-750k CHF  
B: 750k-5M CHF  
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# EN-CV – Cooling & Ventilation

The CV group is in charge of the design, installation, commissioning, operation and maintenance of the cooling systems, pumping stations, air conditioning plants and fluid distribution systems of all accelerators, their experimental areas and some of the special cooling systems of LHC sub-detectors. In addition it performs **Computational fluid dynamics (CFD) simulations**, as well as studies on fluid dynamics, ventilation, heat transfer, smoke behaviour, gas and radio nuclides propagation.



# CV contracts: upcoming industrial opportunities

- Consultancy contract

Detail @  
I. Ruehl

Ref.	Contract description	Comments	MS	IT	Contract	Cost range [kCHF]
IT4728	Studies for ventilation systems for FCC	Consultancy specialised on environmental, safety and energy consumption aspects	ongoing	2022	2022-23	A
IT4728	Studies for cooling systems for FCC		ongoing	2022	2022-23	A
	Recurrent tendering of supply and installation of cooling and/or ventilation plants following approval and financing of projects					A-B
IT4636	Demineralised water production				2024	A

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# EN-EL – Electrical Engineering

The EL group is in charge of

- The **electrical distribution network from 400 kV to 400/230 V**. Its main missions are to operate, maintain, extend and renovate the network, analyse and make projections for CERN electrical energy consumption and manage relations with the energy suppliers;
- the **cabling and optical fibres activities**. Its main missions are to install control cables, water cooled cables, and fibre optics for users. This activities include the management of infrastructures (cable trays, ducts, patch panels,etc.) and the necessary removal of old and unused installations.



# EL works: upcoming industrial opportunities

- **Supply contracts (simple supply or blanket purchase contracts up to 5 years)**
  - Equipment supply, installation, commissioning (and maintenance in some cases)
  - **12** currently in place

Detail @  
M. Nonis

Ref	Contract description	Comments	Market Survey	Invitation to Tender	Estimated volume	Cost range
	Supply & installation of primary equipment for 66 kV substation	Simple supply	Q4 2022	Q1 2023		B
	Supply & installation of a 66/18 kV 38 MVA power transformer	Simple supply	Q4 2022	Q1 2023	1 unit	A
	Supply of 2 emergency genseets rated 1.4 and 2.5 MVA	Simple supply	Q2 2023	Q4 2023	2 units	B
	Supply of UPS systems (300 to 600 kVA)	Simple supply	Q2 2023	Q4 2023	8 units	A
IT-4749	Supply of LV switchboards	Existing contract with ABB	Q1 2022 Ongoing	Q3 2022	70 units	D
	Supply of UPS systems	Existing contract with Borri	Q2 2022	Q1 2023	150 units	B
IT4727	Supply of optical fibre and microducts	New Contract	Q3 2022	Q4 2022	200 km	A
IT-4643	Supply of water-cooled cables	New contract	Ongoing	Q4 2022	120 cables – 2.5 km	B
	Supply of 24 kV compact switchgear	Existing contract with Ormazabal	2023		TBD	A
	Supply of radiation resistant single mode optical fibres	New contract	2023		1500 km	A/B
	Supply of lead acid batteries		2022	2022	120 units	A

Cost Range :  
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D: > 10M CHF



# EL works: upcoming industrial opportunities

- **Maintenance contracts (service contracts up to 7 years)**
  - Installation services (electrical, cabling and fibre optics)
  - **2** currently in place
  
- Maintenance of equipment :
  - **6** currently in place

Detail @  
M. Nonis

Ref.	Contract description	Comments	MS	IT	Cost range
IT-4717	<b>maintenance services of Uninterruptible Power Supplies (UPS) on the CERN site</b>	Existing contract with Borri	Q2 2022	Q3 2022	B
	<b>Maintenance of 400 kV and 66 kV transformers</b>	New contract	2022		A
IT-4740	<b>Maintenance of diesel generator sets</b>	Existing contract with 2H Energy	Q2 2022	Q4 2022	A
	<b>General maintenance services</b>	Existing contract with COMSA	Q3 2022	Q4 2022	C
IT-4766	<b>maintenance services for power electrical distribution equipment and lighting systems</b>		Q2 2022	Q4 2022	B

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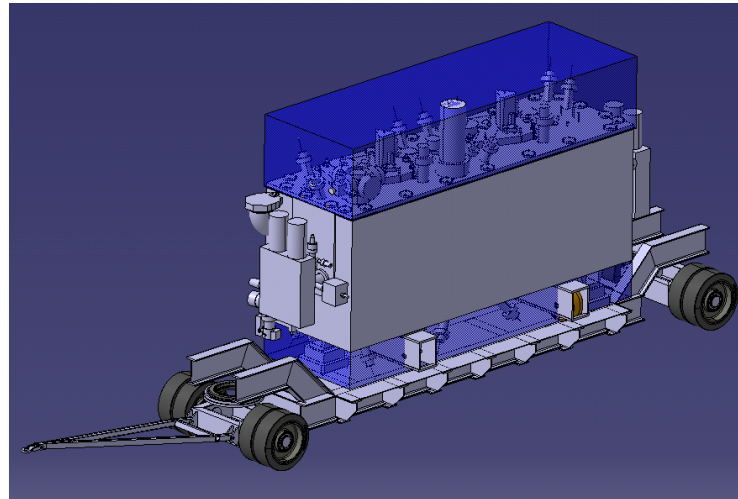
# EN-HE - Handling Engineering

The HE Group prepares, organizes and coordinates all transport and handling operations for the CERN accelerators and experiments as well as the transport of thousands of conventional items, chemical and radioactive products per year. The Group manages and maintains all the industrial transport, handling and lifting equipment, personnel and material lifts.

The Group is specialized in the **design, integration and feasibility studies related to the transport and handling operations**. Both standard industrial and custom-built transport and handling equipment is being procured, installed and commissioned.



ALICE TPC transport



LHC connection cryostat

# HE contracts: upcoming industrial opportunities

Detail @  
C. Colloca

Ref.	Contract description	Comments	MS	IT	Contract	Cost range [kCHF]
IT-4780	Supply and renovation overhead cranes above 10 tons		Q3 2022	Q4 2022	2023	B
	Supply and installation of 1 overhead crane for clean room		tbd	tbd	2023	A
IT-4623	Maintenance services for lifts on the CERN site	Tertiary and controlled areas	Ongoing	Q3 2022	Q1 2023	B
	Supply of a 2.5 ton forklift side loader bldg. 129		na	Q3 2022	2023	A
	Electrical tow tractor 35t capacity for LHC TAN transport		na		2024	A
	Location nacelles élévatrices		na		2025	A
IT-4797	Replacement of ten personnel lifts serving the SPS accelerator underground facilities		Q3 2022	Q4 2022	2023	B
	Supply of a 100 tons road tractor for semi trailers			2024	2024	A
IT-4721	Maintenance of trucks and heavy vehicles belonging to CERN at the contractor's premises.		Q3 2022	Q4 2022	2023	A
IT-4780	Supply and refurbishment of an estimated quantity of eight overhead travelling cranes with capacities above 10t.		Q3 2022	Q4 2022	2023	B
IT-4704	Supply and refurbishment of personnel lifts up to 3 ton capacity.		Ongoing	2022	2022	B

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# EN-IM – Information Management

The IM group provides **applications and support for engineering information management** throughout the whole Organization and its different projects.

This includes for example mechanical CAD tools (such as CATIA), Product Lifecycle Management systems (Smarteam / Aras), the Engineering Data Management Service (EDMS) as well as the Enterprise Asset Management platform (Infor EAM).

The group helps implementing and configuring these tools according to user needs while ensuring that coherent processes are applied and provides user training.



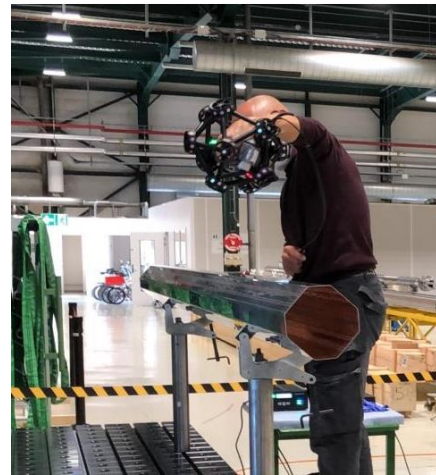
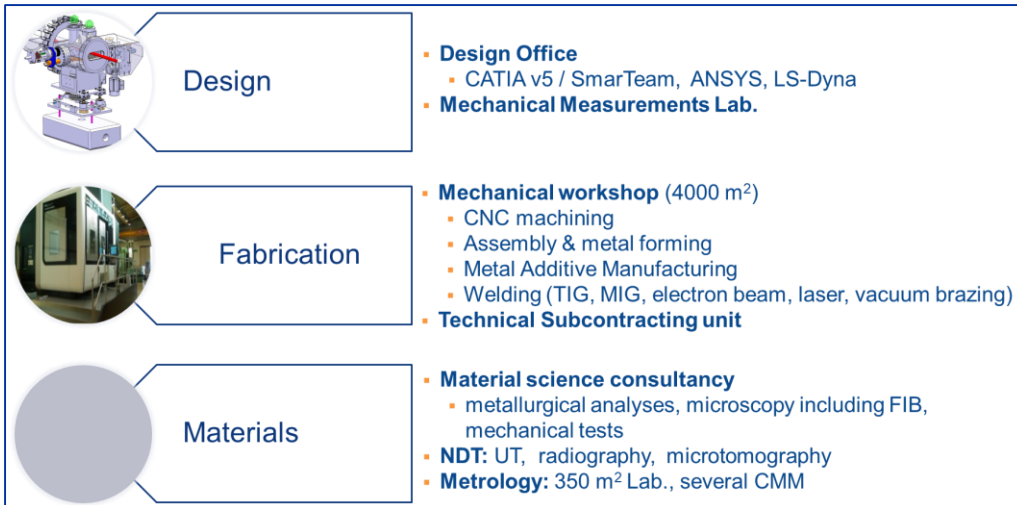


# EN-MME - Materials & Mechanical Engineering

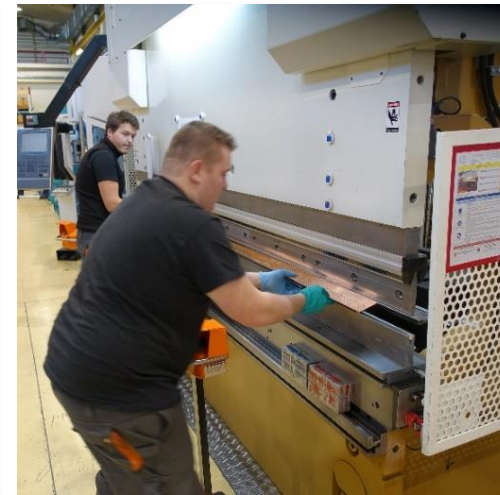
The mandate of the MME group is to provide to the CERN community specific **engineering solutions combining mechanical design, fabrication and material sciences**, using in-house and industry facilities, for beam accelerator components and physics detectors – prototypes and development.



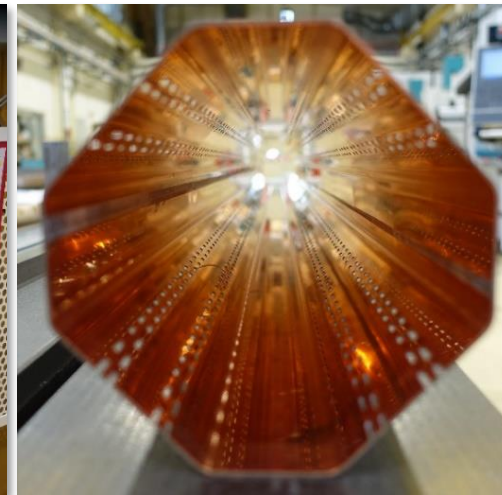
Rotating Table for SC magnets assembly



High precision 3D scanner metrology



High precision press brake forming

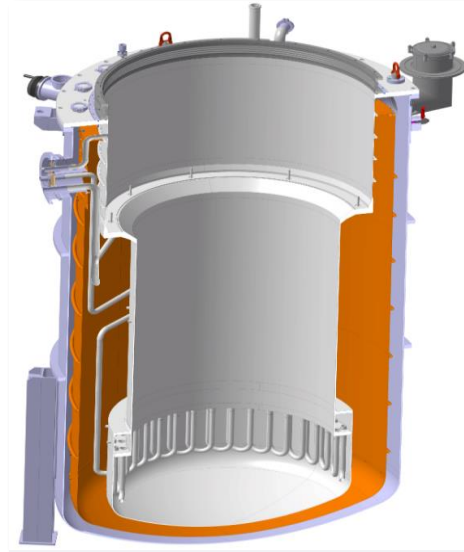


# MME works: upcoming industrial opportunities

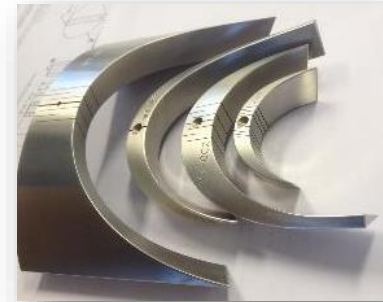
HIE- Isolde Cavities



- Long Overhang Machining from Monoblock Copper - D320 x L900
- Tolerances in the tenth of mm..



FRESCA2 - Outer cryostat assembly



CRAB Cavity

Mechanical workshop: 2'000 – 2'500 orders/year



# MME works: upcoming industrial opportunities

Ref	Contract description	Comments	MS	IT	Cost range
	Design office (2 contracts)	Activities at CERN site	2022	Q3 2023	D
	Workshop, fabrication at CERN		2024	2024	D
IT-4679	Supply of a hydraulic press brake dedicated to high precision forming			Q3 2022	A
	Replacement vacuum brazing furnace VAS		2023	2023	A
	Replacement milling equipment DMU80			June-2023	B
	Replacement milling equipment DMU60			2024	A
	Industrial X-ray inspection system			2022	< 200 kCHF
	DCM Vacuum Vessels (x4)			2022-2023	< 200 kCHF
	Distributed optical sensing electronics			2022	< 200 kCHF
	Replacement small press brake			2023	A
	Replacement vacuum brazing furnace BOREL ½			2023	A
	Replacement vacuum air brazing furnace BOREL 2/2			2023	A

Detail @  
S. Atieh

Cost Range :  
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Please refer to up-to-date list on : <https://procurement.web.cern.ch/>



# Summary and contact persons in the Groups

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# Thank you for your attention

## Q&A