



ENGINEERING  
DEPARTMENT

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

M Nonis (EN Department)

12th September 2022

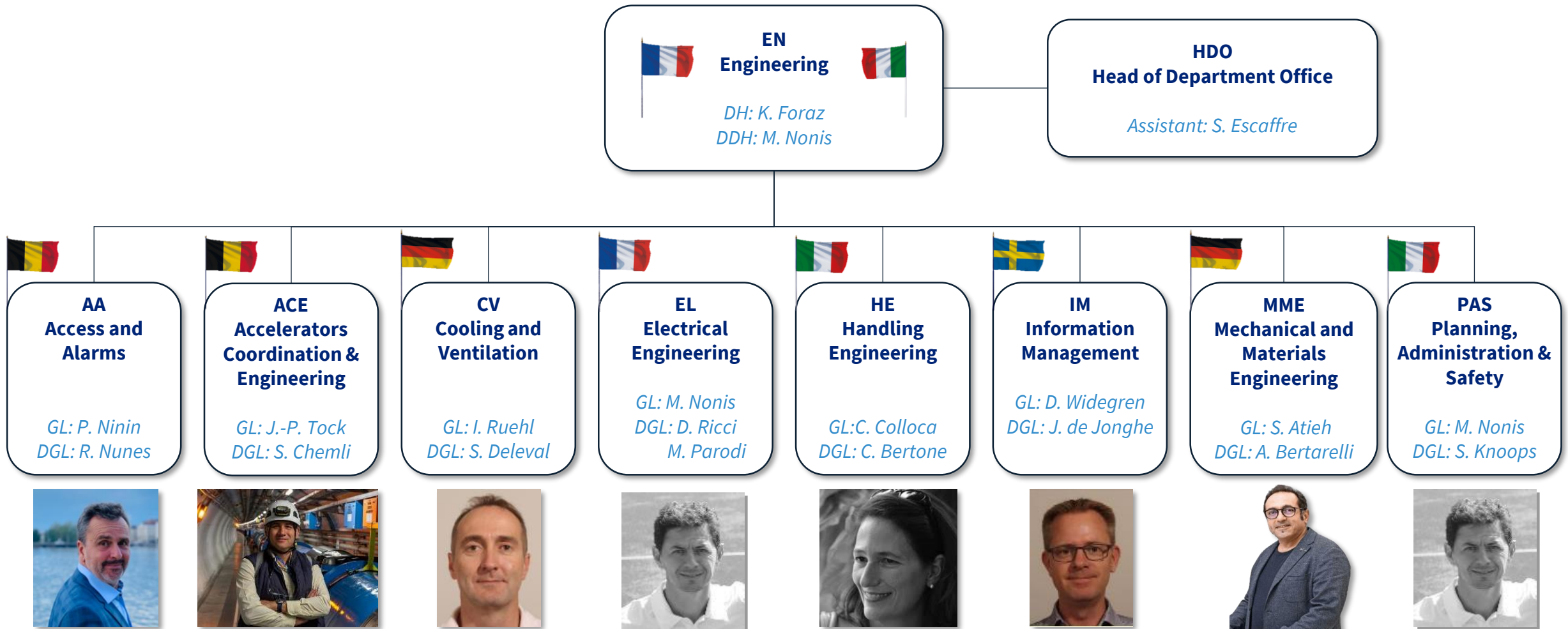
# ENgineering department – Mandate

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:

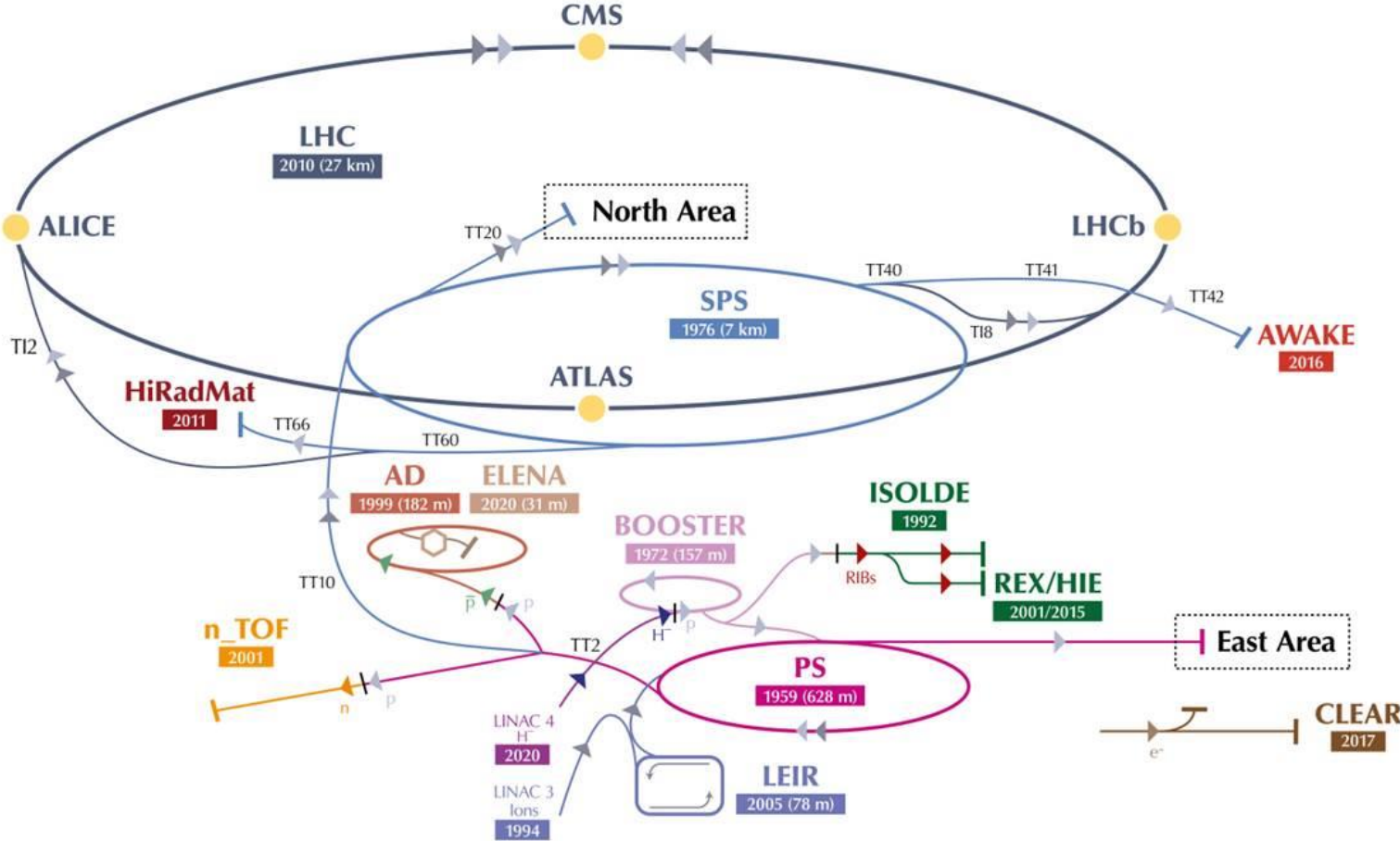
- Operation, maintenance and consolidation of infrastructure systems for **cooling, ventilation, transport, handling, electricity, access and alarms**, as well as design and installation of infrastructure systems for the new facilities,
- **Mechanical engineering and materials expertise** for the design, 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 - Organigramm

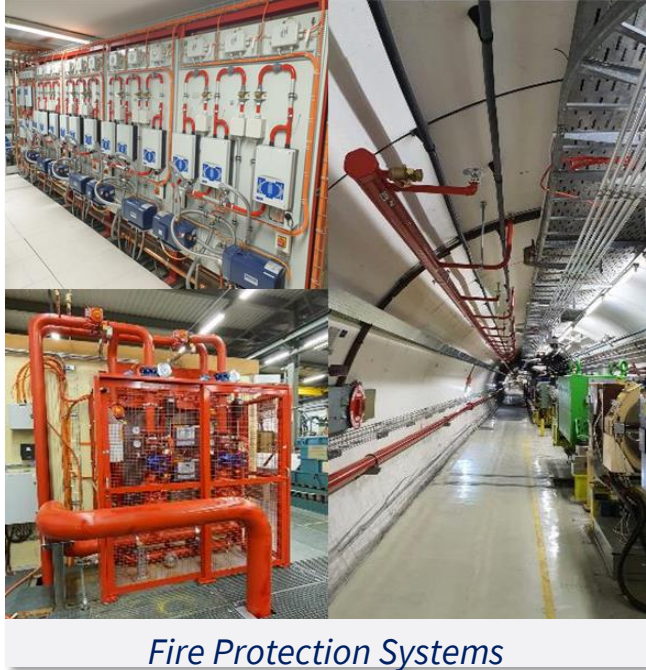


# CERN Accelerator chain

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 Safety Systems concerns:

- *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.*



Video Surveillance



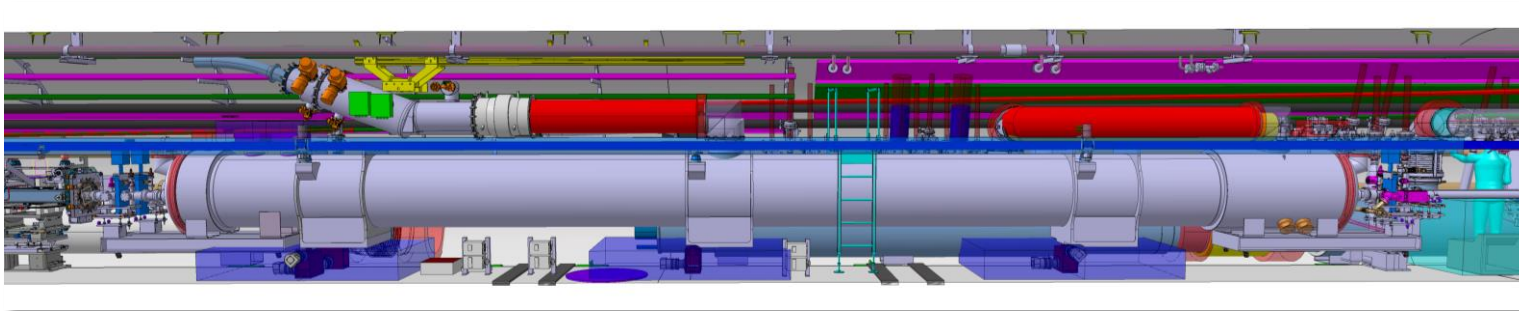
# EN-AA Alarms and Access : Future Contracts

Ref:	Scope	MS	IT	Contract Start/End	Remarks	Cost range
IT-4600	<b>Industrial Controls and Safety Systems Supply</b>	Jul-2021	In discussion among the group	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

# 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



# 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 A

## ▪ Consultancy contract

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	9/2022	2022-23	A
IT4728	Studies for cooling systems for FCC		ongoing	9/2022	2022-23	A
	Recurrent tendering of supply and installation of cooling and/or ventilation plants following approval and financing of projects					A-B
IT4636	Demineralized water production	Direct negotiation – no tender			2024	A

Scope for Technical galleries consolidation	Type	PE/IT schedule	Work Schedule	Comments
Supply of <b>geo-referenced points clouds</b> Preveessin area Meyrin - French part Meyrin - Swiss part	PE PE PE	Q3/2022 Q1/2023 Q3/2023	Q4/2022 Q2/2023 Q4/2023	
Renovation of <b>super heated water network</b> 825 – West + West Area 1st phase 825 – Central + West Area 2 <sup>nd</sup> phase 825 – East	IT	Q4/2022	Q3 2023 Q3 2024 Q3 2025	<ul style="list-style-type: none"> <li>One IT for three periods of works</li> <li>3000 m of DN150 – DN300 to be dismantled .</li> <li>3000 m of DN150-DN300/PN 25 to install incl. rockwool insulation</li> </ul>
Renovation of <b>drinking water network</b> 825 – West + West Are 1st phase 825 – Central + West Area 2nd phase 825 – East	IT	Q4/2022	2023 2024 2025	<ul style="list-style-type: none"> <li>One IT for three periods of works</li> <li>3000 m of DN25 – DN250 to be dismantled .</li> <li>3000 m of DN25-DN200/PN 25 to install</li> </ul>

# 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

Ref	Contract description	Comments	Market Survey	Invitation to Tender	Estimated volume	Cost range
	<b>Supply &amp; installation of primary equipment for 66 kV substation</b>	Simple supply	Q4 2022	Q1 2023		B
	<b>Supply &amp; installation of a 66/18 kV 38 MVA power transformer</b>	Simple supply	Q4 2022	Q1 2023	1 unit	A
	<b>Supply of 2 emergency genseets rated 1.4 and 2.5 MVA</b>	Simple supply	Q2 2023	Q4 2023	2 units	B
	<b>Supply of UPS systems (300 to 600 kVA)</b>	Simple supply	Q2 2023	Q4 2023	8 units	A
IT4749	<b>Supply of LV switchboards</b>	Existing contract with ABB	Q1 2022 Ongoing	Q3 2022	70 units	D
	<b>Supply of UPS systems</b>	Existing contract with Borri	Q2 2022	Q1 2023	150 units	B
IT4727	<b>Supply of optical fibre and microducts</b>	New Contract	Q3 2022	Q4 2022	200 km	A
IT4643	<b>Supply of water-cooled cables</b>	New contract	Ongoing	Q4 2022	120 cables – 2.5 km	B
	<b>Supply of 24 kV compact switchgear</b>	Existing contract with Ormazabal	2023		TBD	A
	<b>Supply of radiation resistant single mode optical fibres</b>	New contract	2023		1500 km	A/B
	<b>Supply of lead acid batteries</b>		2022	2022	120 units	A

# 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

Ref.	Contract description	Comments	MS	IT	Cost range
IT4717	<b>Maintenance of Borri UPS systems</b>	Existing contract with Borri	Q2 2022	Q3 2022	B
	<b>Maintenance of 400 kV and 66 kV transformers</b>	New contract	2022		A
IT4740	<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

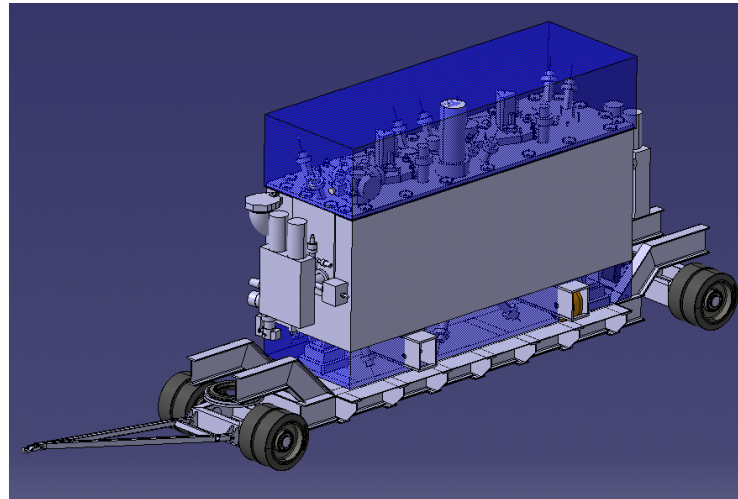
# EN-HE - Handling Engineering

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

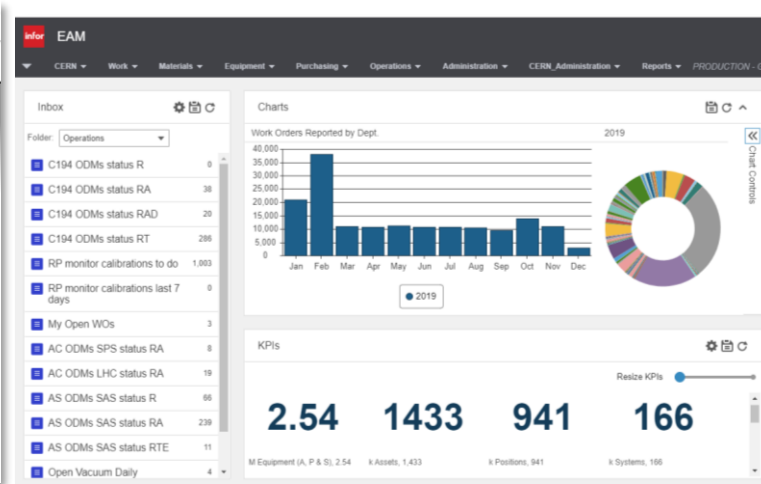
Ref.	Contract description	Comments	MS	IT	Contract	Cost range [kCHF]
IT-4780	Supply and renovation overhead cranes above 10 tons		Q3 2022	Q4 2022	2023	B
IT	Refurbishment of a ROCLA vehicle		2022	Q3 2022	2023	A
IT4623	Provision of maintenance services for lifts	3 contracts: 2 tertiary, 1 controlled areas	-	Q2 2022	Q1-2023	B
MS 4797	Replacement SPS lifts		Ongoing	Q3 2022	Q1 2023	B
IT4704	Refurbishment of personnel lifts up to 3 ton		-	Q2 2022	Q1 2023	A

# 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.

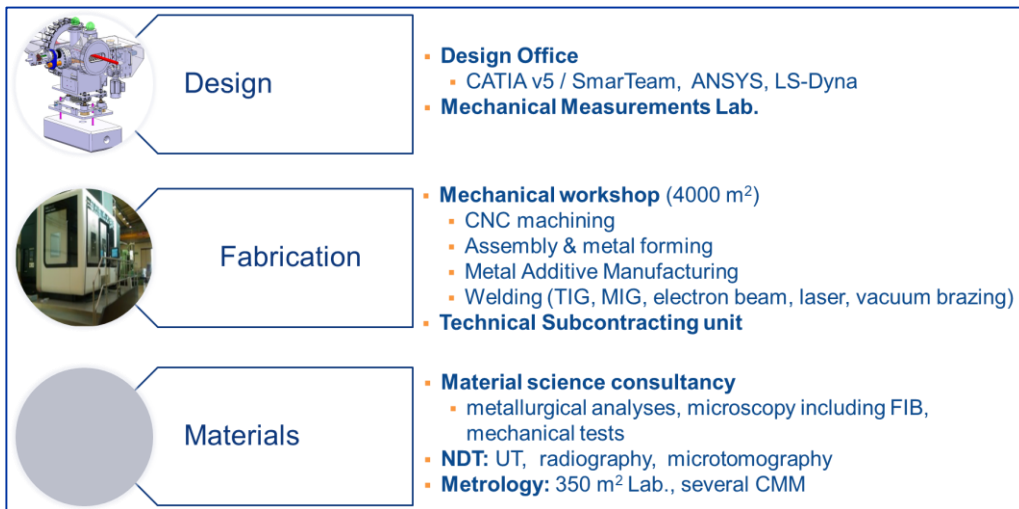


# EN-MME - Materials & Mechanical Engineering

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

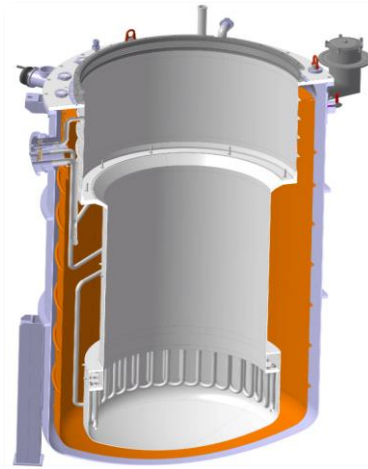


# MME works: upcoming industrial opportunities

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

Ref	Contract description	Comments	MS	IT	Cost range
	<b>Design office (2 contracts)</b>	Activities at CERN site	2022	Q3 2023	D
	<b>Workshop, fabrication at CERN</b>		2024	2024	D
IT4679	<b>Supply of a hydraulic press brake</b>		Q3 2021	Q3 2022	A
	<b>Replacement vacuum brazing furnace VAS</b>		2023	2023	A

# MME works: upcoming industrial opportunities (suite)

Ref	Contract description	Comments	MS	IT	Cost range
	Replacement milling equipment DMU80			June-2023	B
	Replacement milling equipment DMU60			2024	A
	Industrial X-ray inspection system			2022	A
	DCM Vacuum Vessels (x4)			2022-2023	A
	Distributed optical sensing electronics			2022	A
	Replacement small press brake			2023	A
	Replacement vacuum brazing furnace BOREL ½			2023	A
	Replacement vacuum air brazing furnace BOREL 2/2			2023	A
IT 4669	Supply, Installation and Commissioning of a 4+1 Axis Horizontal Maching Center		2021	Q1 2022	A

# Contact persons in the Groups

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# Thank you for your attention

## Q&A