Doing Business with CERN

Webinar Explore Business Opportunities in Big Science / 28 May 2025

Nordine Azizi

Procurement Service

AGENDA

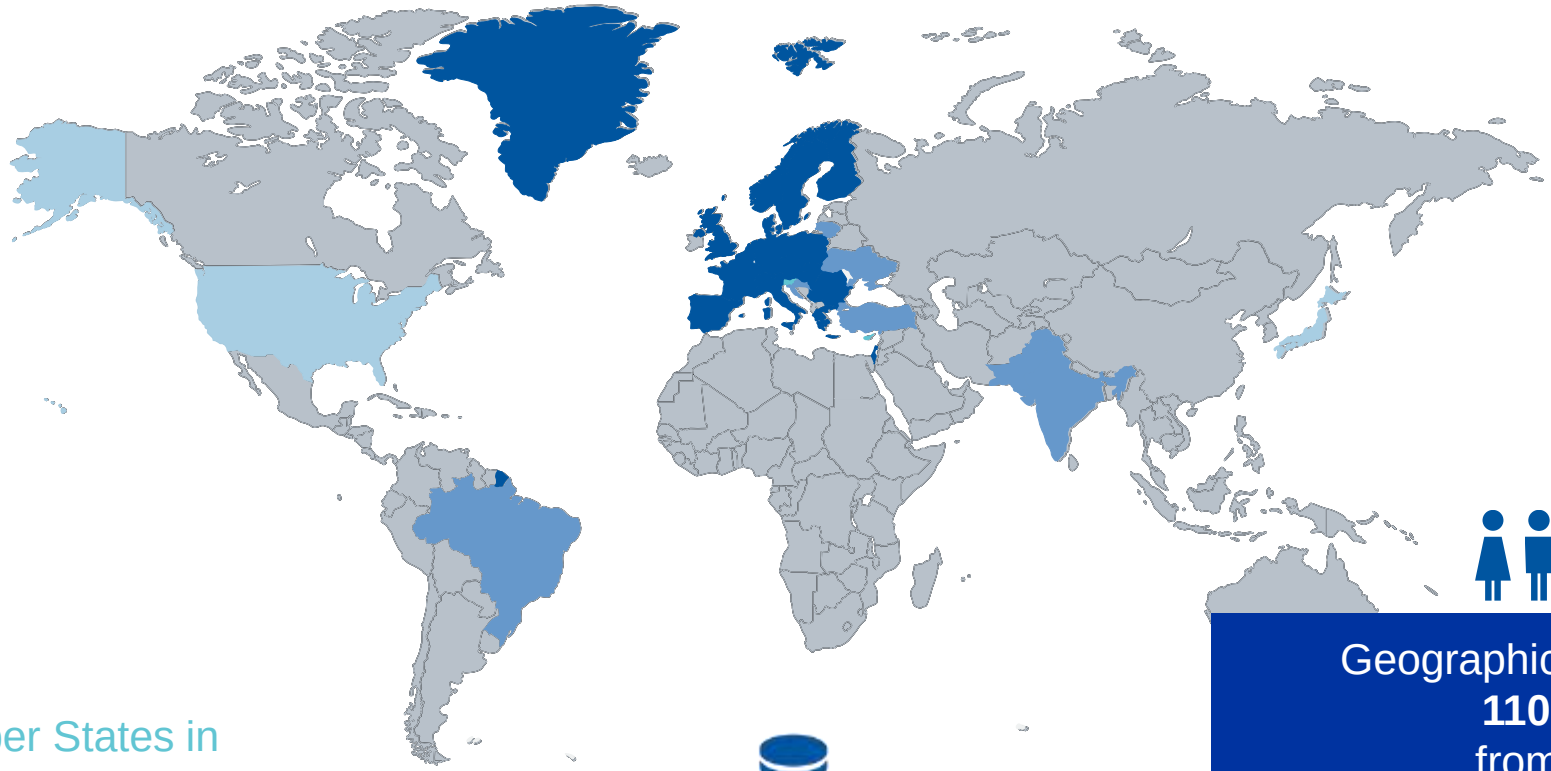
- **Introduction**
  - Legal Framework
  - Budget
  - What we buy
- **Procurement @ CERN**
  - Procedures
- **Procurement website and forthcoming needs**
- **AI at CERN in Research**

INTRODUCTION

Legal Framework

- **CERN**, an **Intergovernmental Organization**, was established in July 1953, by the “Convention for the establishment of a European Organization for Nuclear Research”;
- As an Intergovernmental Organization, CERN is not a legal entity under national law but **governed by public international law**;
- CERN is therefore entitled to establish its **own internal rules** necessary for its proper functioning, such as the rules under which it **purchases** equipment and services.

In 1954 CERN had 12 Member States
Today CERN has 24 Member States



24 Member States

2 Associate Member States in the pre-stage to membership

8 Associate Member States

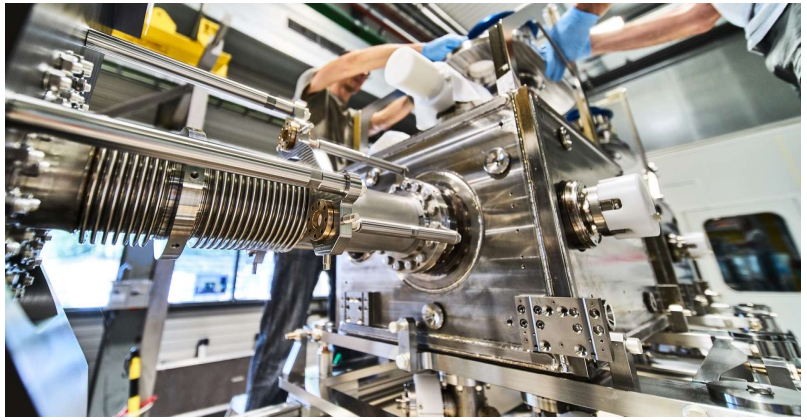
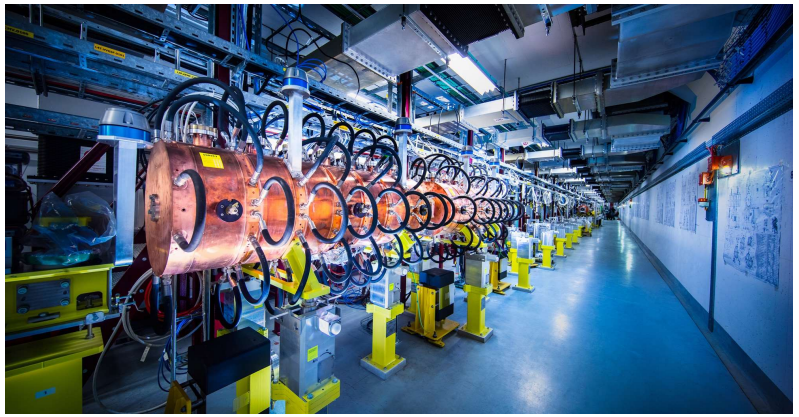
4 Observers

Yearly budget ~ 1300 MCHF

Geographical & cultural diversity
110 nationalities,
from **77** countries

~ **2,676** Staff members
~ **2,000** contractors' employees
~ **13,000** physicists /users

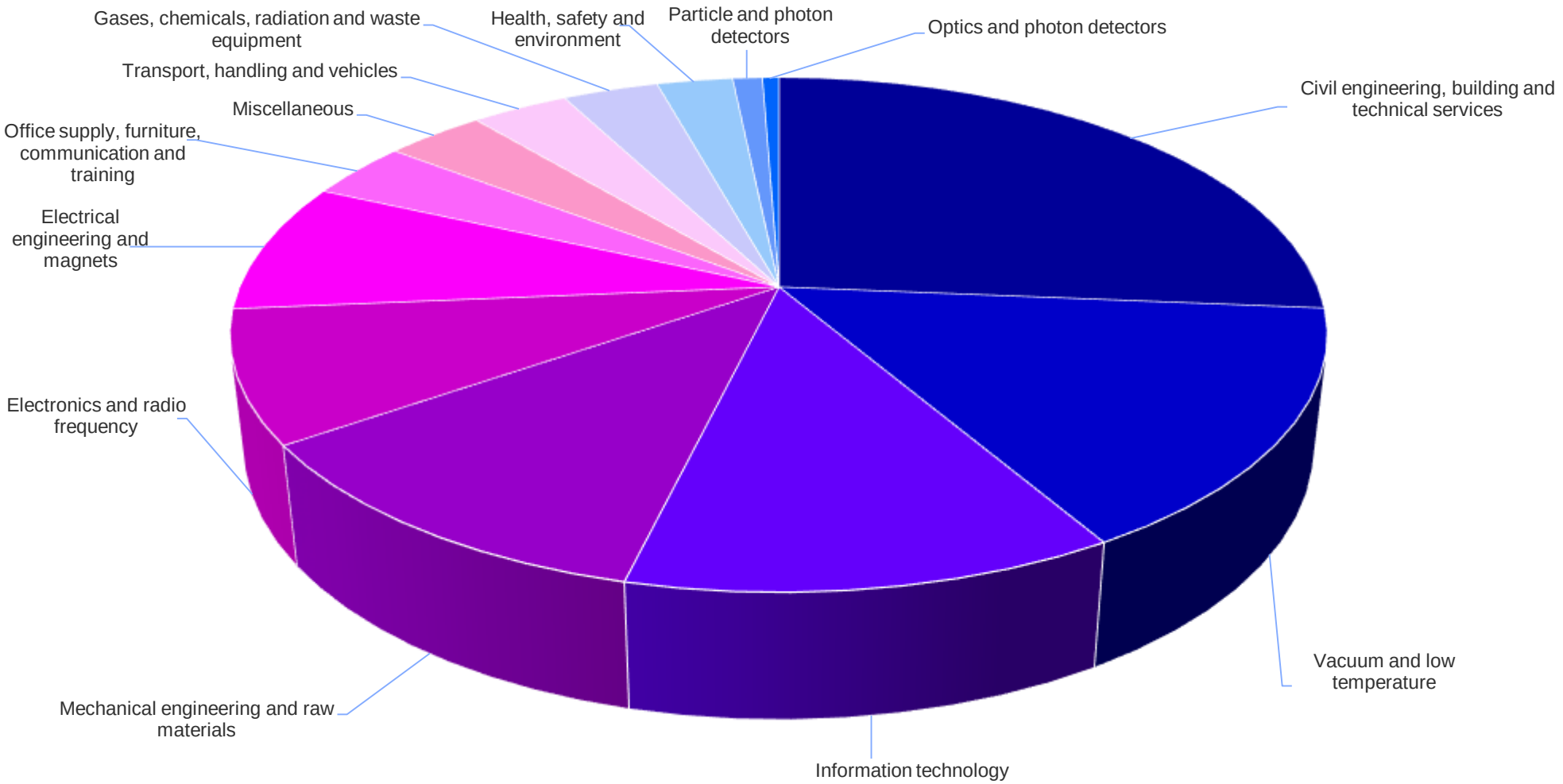


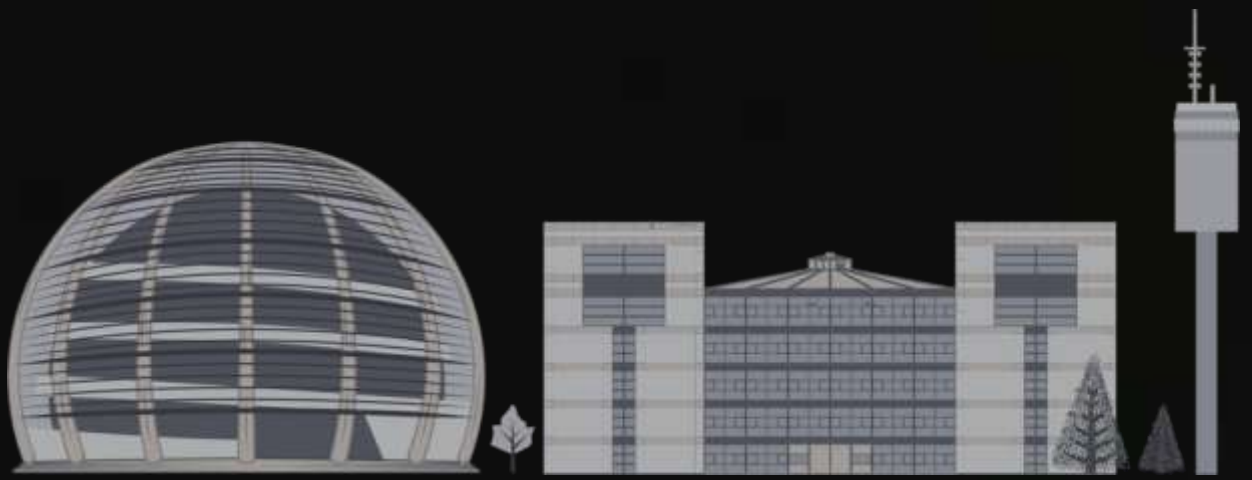





What we buy

- Civil engineering
- Cooling and ventilation
- Electrical engineering and magnets
- Information Technology
- Mechanical engineering and raw materials
- Electronics and radiofrequency
- Cryogenic and vacuum equipment
- Health and safety equipment,
- Transport and handling equipment
- Office supply, furniture
- Industrial services on the CERN site

Supplies (279MCHF spent in 2024 – CERN budget only)

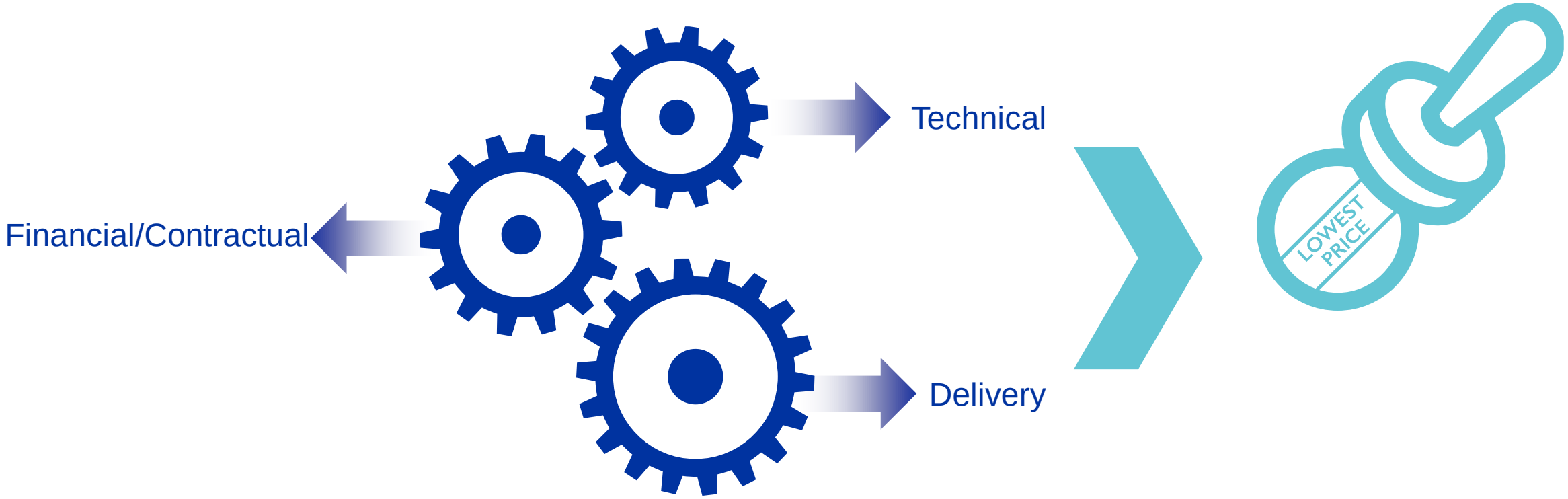




PROCUREMENT @CERN

Adjudication basis

Award for supplies (and services, exceptionally) based on:
Lowest compliant bid



2 Types of Enquiries

“Price Enquiry” (DO) :

1. 10’000 CHF ≤ Enquiries < 400’000 CHF

“Invitation-to-Tender” (IT) :

2. Enquiries ≥ 400’000 CHF

Requirements between 10,000 and 400,000 CHF

“Price enquiry” (Demande d’Offre - DO)

- **Submission deadline: 4-6 weeks from date of dispatch;**
- **All price enquiries above 50,000 CHF are also sent to the Industrial Liaison Officers (ILOs) for information;**
- **Price enquiries consist of:**
  - Technical specification and annexes;
  - Tender form (and a technical annex - optional);
  - CERN’s General Conditions (contracts, invitations to tender, safety, etc.)
- **Price enquiries between 200,000 – 400,000 CHF announced on CERN’s procurement website, see “Business Opportunities”**

Requirements exceeding 400’000 CHF (1/2)

“Market Survey” (MS)

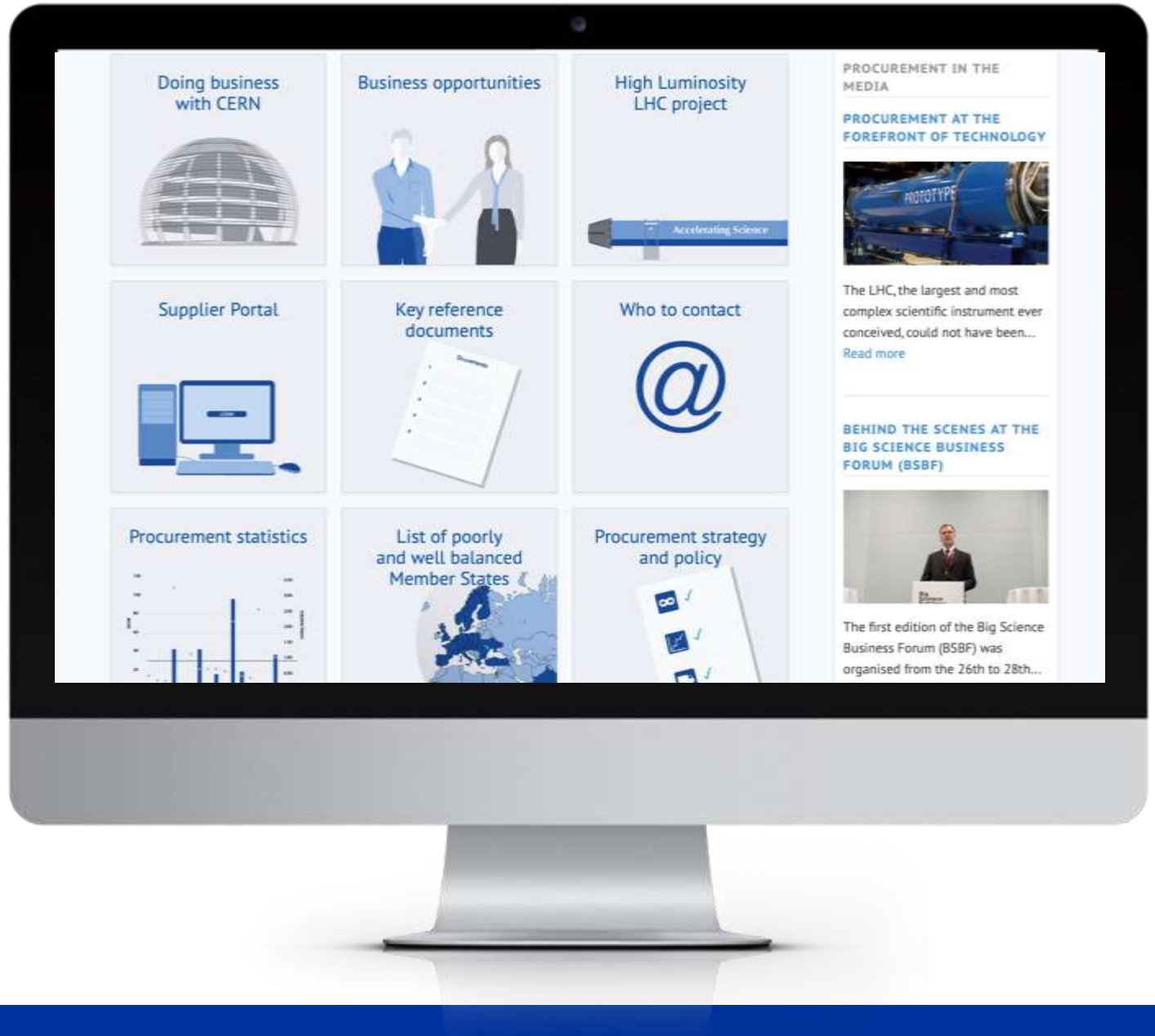
- **Prior announcement on CERN’s procurement website, see “Business Opportunities”**
  - At this stage, interested firms are encouraged to contact CERN in order to have a clear understanding of the requirement, allowing them to begin their organization ahead of the tendering process.
- **Market surveys consist of:**
  - “Technical Description” and;
  - “Qualification Questionnaire” (financial and technical).
- **Submission deadline: 4 weeks, or more if the MS is still online.**

Requirements exceeding 400’000 CHF (2/2)

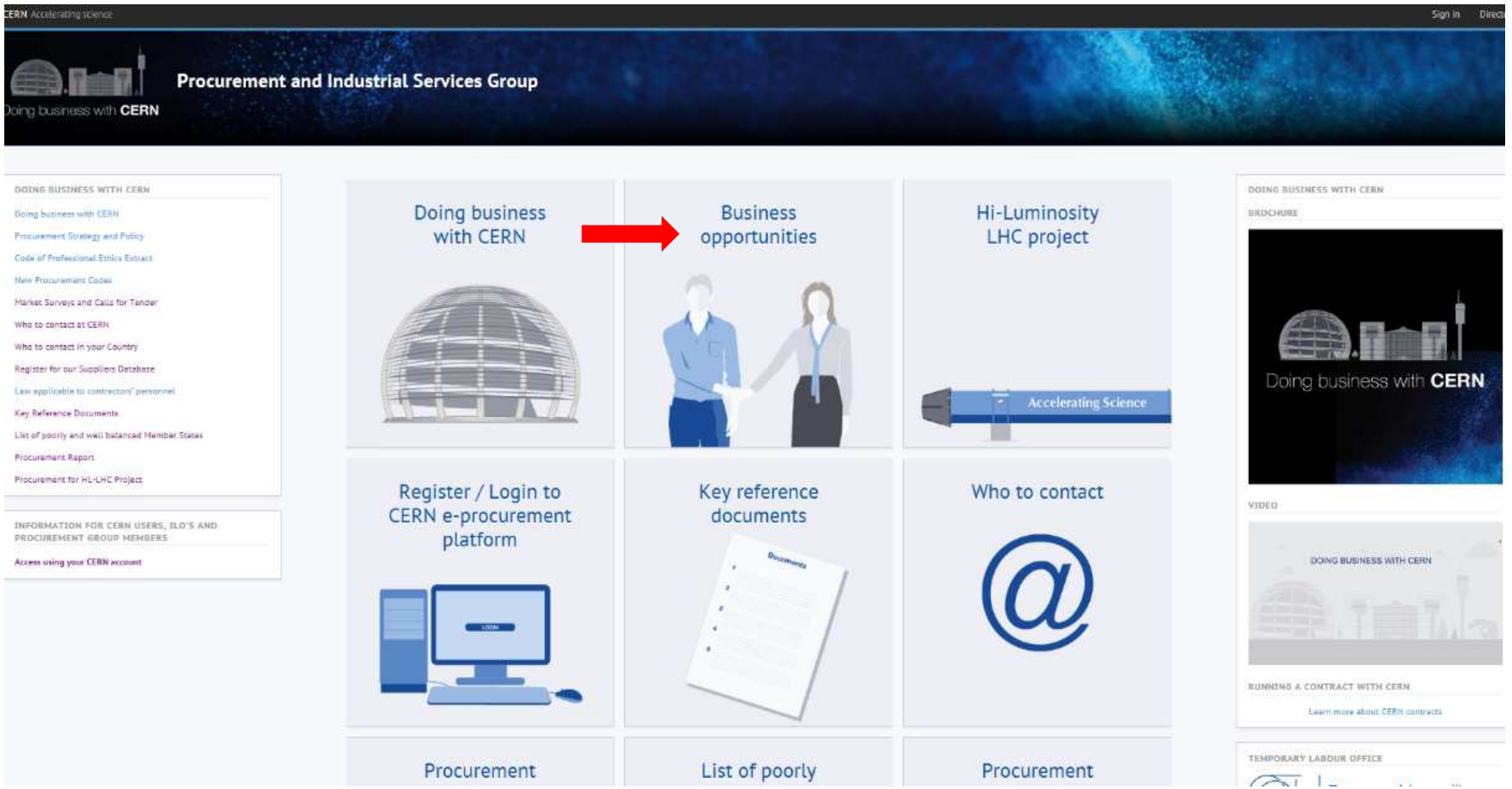
“Invitation to tender” (IT)

- **Sent to qualified and selected firms only;**
- **Submission deadline: 4 weeks from date of dispatch (with a longer period for more complex requirements);**
- **Firms shall ask all necessary questions in writing to understand all requirements and prepare a bid that best matches CERN’s needs;**
- **All invitations to tender are sent to the Industrial Liaison Officers (ILOs) for information;**
- **Bids shall be submitted via CERN’s e-tendering application.**

PROCUREMENT WEBSITE



Procurement Website



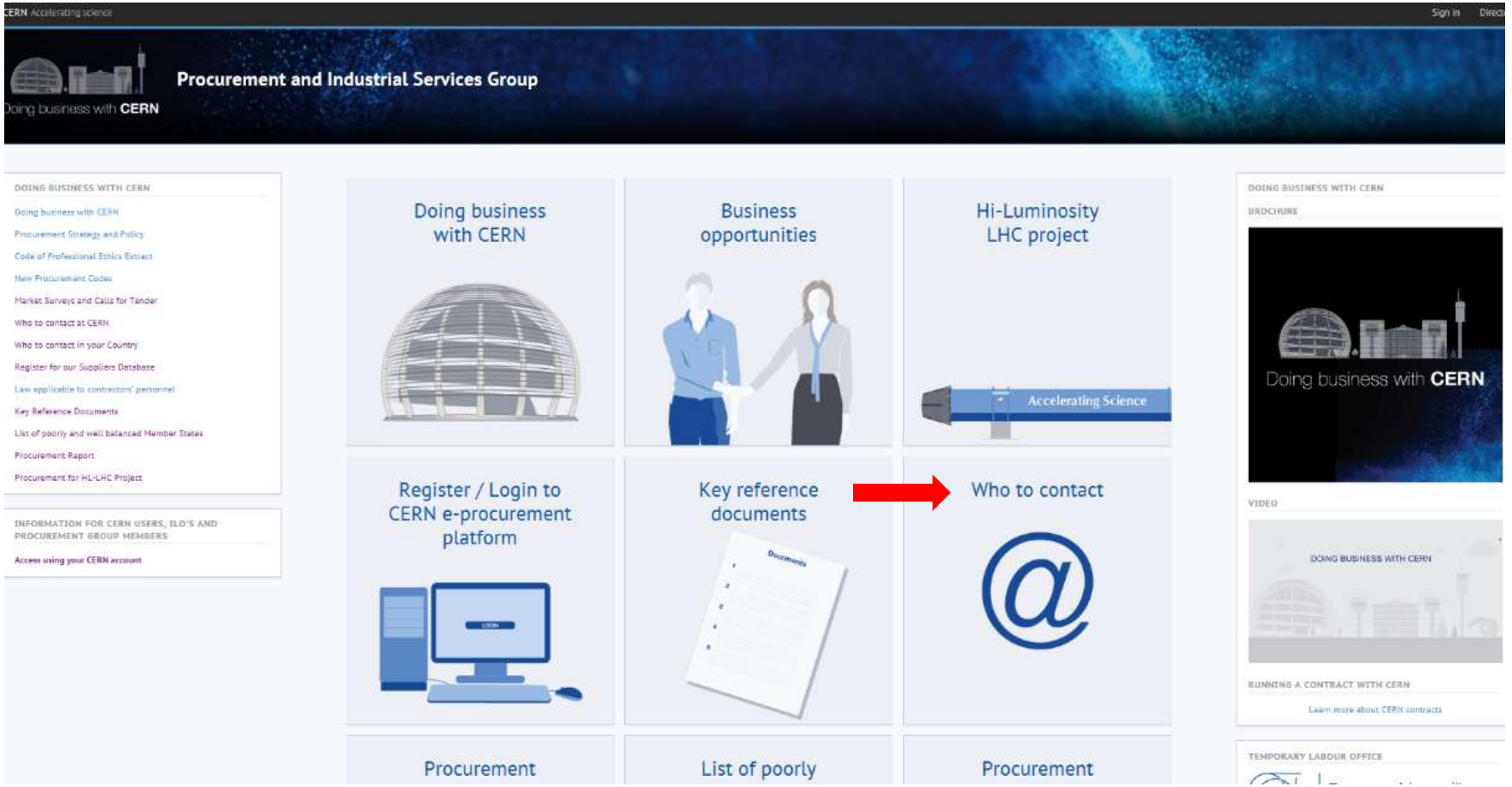
http://procurement.web.cern.ch

CERN Shopping List

Publication date	Type of contract	Reference	Description	Cost Range (CHF)	Status	Next step
23/02/2022	Supply	MS-4747/SCE	Supply of small industrial accessories ordered through an electronic catalogue	5M - 10M	Announcement	Market Survey 03/2022
10/02/2022	Experiments	MS-4752/EP/CMS	Supply including design of a hypoxic and dry air generation plant	200k - 750k	Market Survey	Invitation to Tender 06/2022
03/02/2022	Services	MS-4744/SCE	Service contract for the provision of cleaning services on the Swiss part of CERN site	5M - 10M	Announcement	Market Survey 05/2022
19/01/2022	Supply	MS-4743/SCE	Framework Market Survey concerning the provision of general civil engineering works for the construction of new structures and industrial buildings on the Swiss or French parts of the CERN site.	750k - 5M	Announcement	Market Survey 03/2022
17/01/2022	Services	MS-4722/SCE	Service contract for small-scale civil engineering works on the CERN site.	5M - 10M	Market Survey	Invitation to Tender 05/2022

https://forthcoming-ms.app.cern.ch/#!/

Procurement Website



http://procurement.web.cern.ch

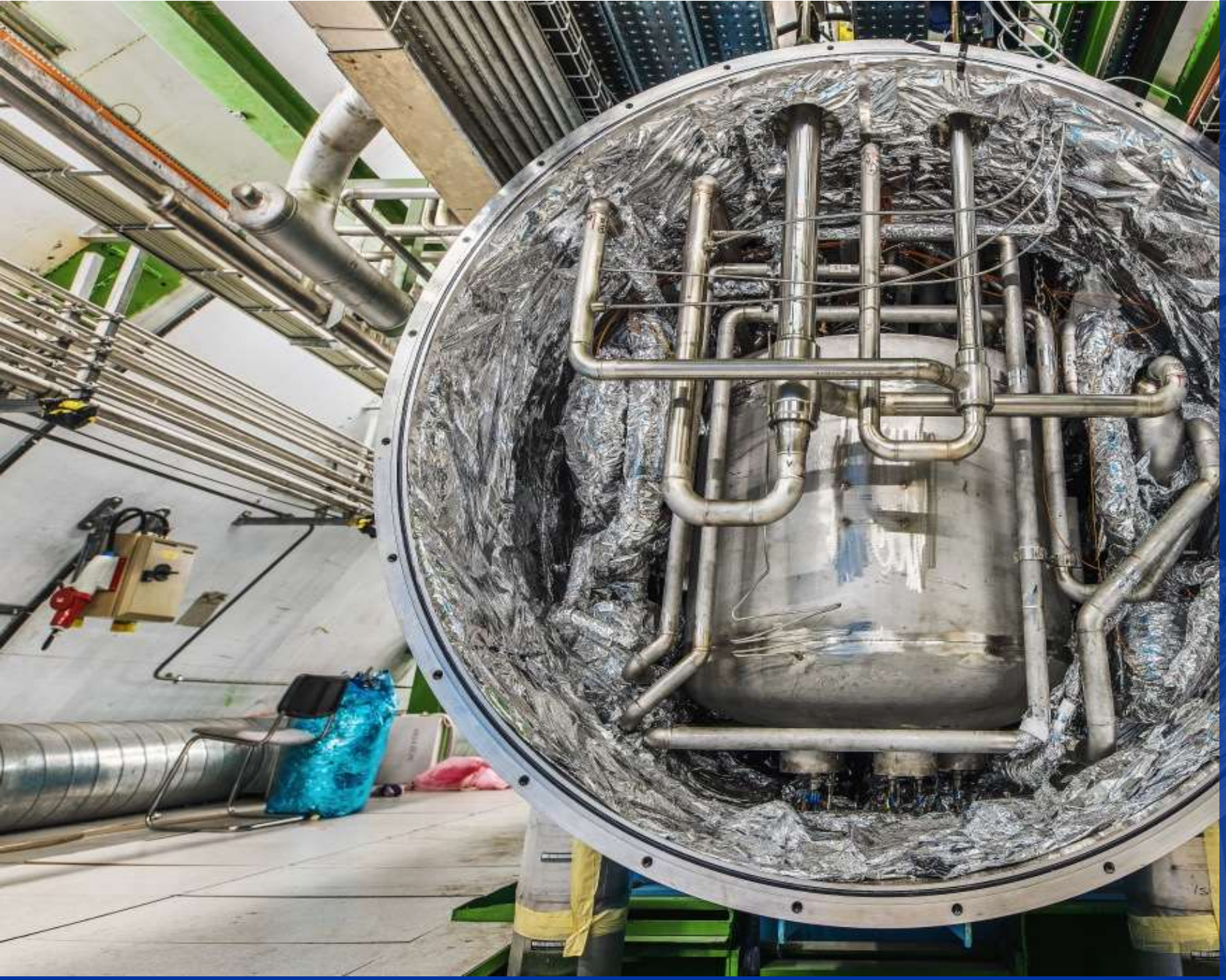
Contact in your country

ILO: Industrial Liaison Officer

- **Who to contact in your Country**

Industrial Liaison Officers (ILO's) are appointed by CERN's Member States to facilitate the flow of communication between CERN and its suppliers. ILO's can provide advice on the opportunities available for doing business with CERN and the support available to firms in their local regions.

Upcoming Tenders at CERN



Cooling & Ventilation, Cryogenics

NA-CONS: BA80 cooling station consolidation and upgrade

Description & Specific Condition :

Design, dismantling when applicable, supply, installation and commissioning of turnkey new or partially renovated cooling systems for the demineralised water cooling station and water distribution network in BA80.

In order to improve the operability, reliability, availability, maintainability and safety, the demineralised water cooling plant in North Area building BA80 will be subject to consolidation by replacing the aging mechanical equipment. At the same time, the cooling plant capacity will be increased to cope with the additional load required by the new water-cooled Power Converters that will be installed as part of NA-CONS Phase 1 project.

Start of the Contract: Q4 2025

Procurement Code: 01 03 03 00

Cost Range : 1.5MCHF ⇔ 5 MCHF

Planning: MS: MS-5058 published

IT: Q2 2025

Contact: laurentiu.vlasceanu@cern.ch

NA-CONS: CT2 cooling upgrade and consolidation

Description & Specific Condition :

Design, supply, installation, testing and commissioning of the 5th cooling tower cell in CT2.

To meet the requirements of the additional load required by the new users that will be installed as part of the NA-CONS project, a 5th cooling tower cell will be added to CT2. This Invitation to Tender will cover the equipment to be installed in the cell, as well as consolidation works to the pumping station.

Start of the Contract: Q2 2027

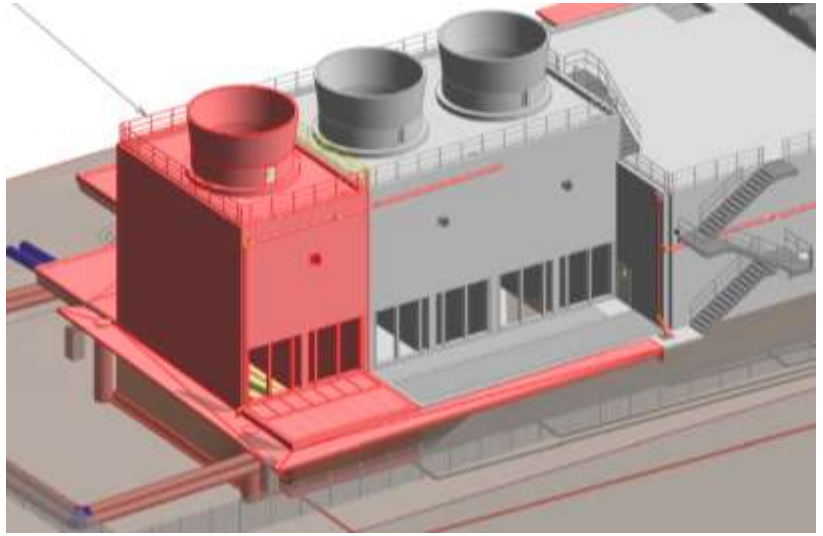
Procurement Code: 01 03 03 00

Cost Range : 400k - 1.5M CHF

Planning: MS: Q4 2026

IT: Q1 2027

Contact: laurentiu.vlasceanu@cern.ch



Cooling system Blanket Purchase Contracts

Description & Specific Condition :

5+1+1 years blanket purchase contract.

Design, supply and installation, test and commissioning of cooling systems on the CERN Site.

Several cooling plants will be consolidated or newly installed during and after Long Shutdown 3 both at the level of LHC, HL-LHC and Experiments.

Projects will range from small to medium and large sizes

All components shall comply with the technical prescriptions

Start of the Contract: December 2025

Procurement Code: 01 03 03 00

Cost Range : >10MCHF

Planning: MS: MS-5058 IT: Q2 2025

Contact: francesco.dragoni@cern.ch

SRF/SA18 Cooling and ventilation systems

Description & Specific Condition :

Design, supply, installation, test and commissioning of all the HVAC systems and the air treatment system in the new building SA18 at Point 1.8 of the LHC.

Key conditions:

- Experience in the installation of HVAC systems of similar size and complexity.
- Experience in the installation of air treatment systems with wet scrubbers.
- Experience in the execution of similar projects in accordance with applicable regulations.

Start of the Contract: Q2 2026

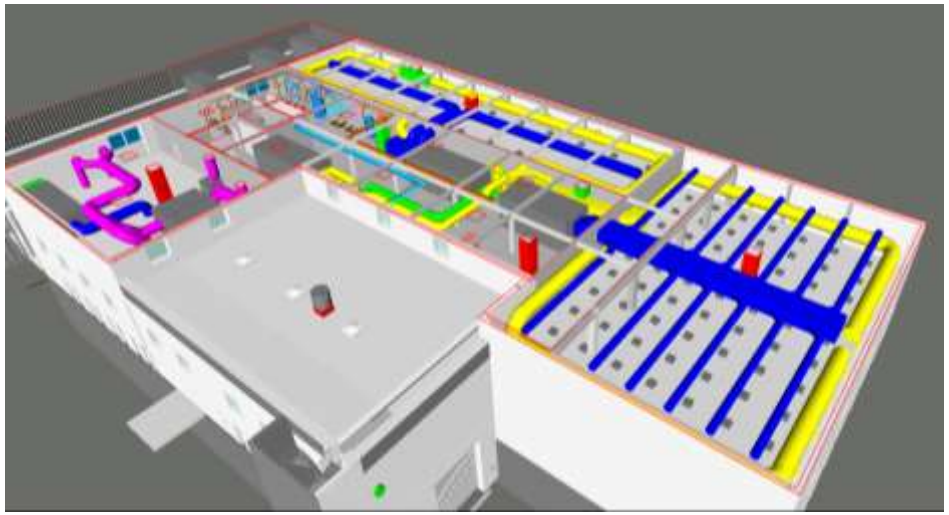
Procurement Code: 01 03 00 00

Cost Range : 5 MCHF ⇔ 10 MCHF

Planning: MS: Q2 2025

IT: Q4 2025

Contact: theodoros.aivaliotis@cern.ch



SRF/SA18 Cleanrooms construction

Description & Specific Condition :

Design, supply, construction, test and commissioning of all the cleanrooms and their associated HVAC systems in the new building SA18 at Point 1.8 of the LHC.

Key conditions:

- Experience in the construction of laminar flow ISO Class 4 cleanrooms and mixed flow ISO 8 cleanrooms of similar size and complexity.
- Experience in the execution of similar projects in accordance with the applicable regulations.

Start of the Contract: Q3 2026

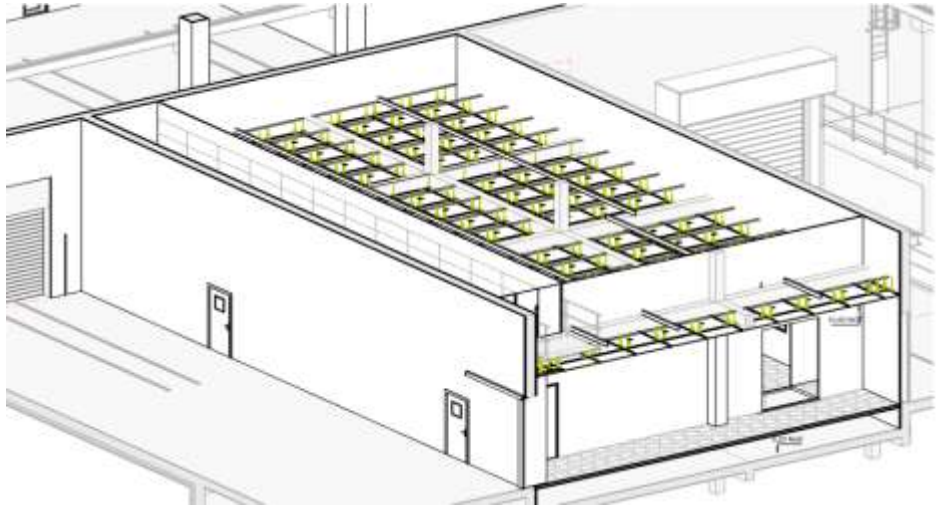
Procurement Code: 01 03 00 00

Cost Range : 5 MCHF ⇔ 10 MCHF

Planning: MS: Q2 2025

IT: Q1 2026

Contact: theodoros.aivaliotis@cern.ch



SRF/SA18 Natural refrigerant heat pumps/chillers

Description & Specific Condition :

Supply of the Air Source Heat Pumps (ASHPs), which will generate heating and cooling water for the new building SA18 at Point 1.8 of the LHC.

Key conditions:

- Experience in the supply of units of similar cooling and heating capacities.
- Utilisation of a natural refrigerant with very low GWP.
- Energy performance validated in accordance to EN14511.

Start of the Contract: Q3 2026

Procurement Code: 01 03 01 03

Cost Range : 400k - 1.5M CHF

Planning: MS: Q3 2025

IT: Q1 2026

Contact: theodoros.aivaliotis@cern.ch

Water treatment plant in point 1

Description & Specific Condition :

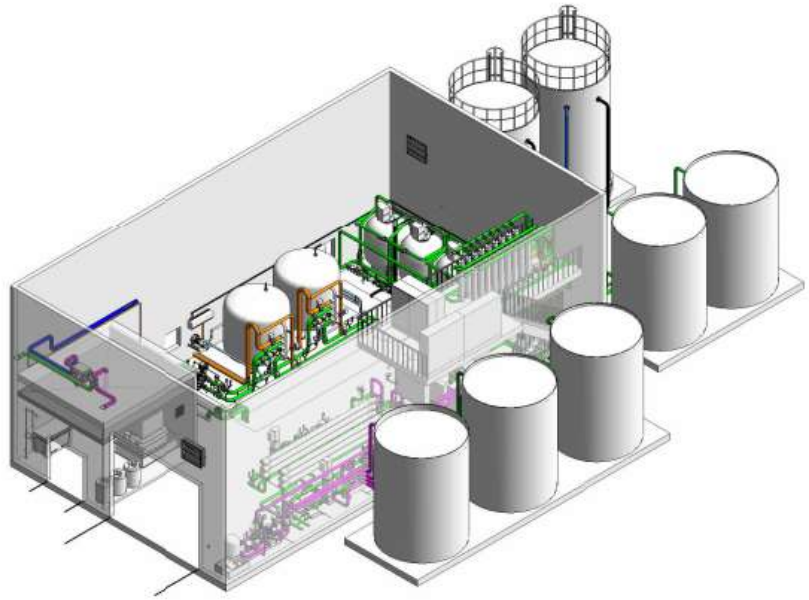
Design, supply, installation, test and commissioning of a water treatment plant including :

- Filtration: multimedia filters, ultrafiltration.
- Softeners.
- Reverse osmosis.
- Tanks and piping.
- Power and control cubicles.

Cost Range : 1.5 MCHF ⇔ 5 MCHF

Planning: MS: Q1 2027 IT: Q3 2027

Contact: serge.deleval@cern.ch



Gas supply infrastructure consolidation

Procurement Code: 13 02 08 00

Cost Range : 400kCHF ⇔ 1.5MCHF

Planning: MS: MS-5037 published

IT: Q2 2025

Contact: **David.Jaillet@cern.ch**

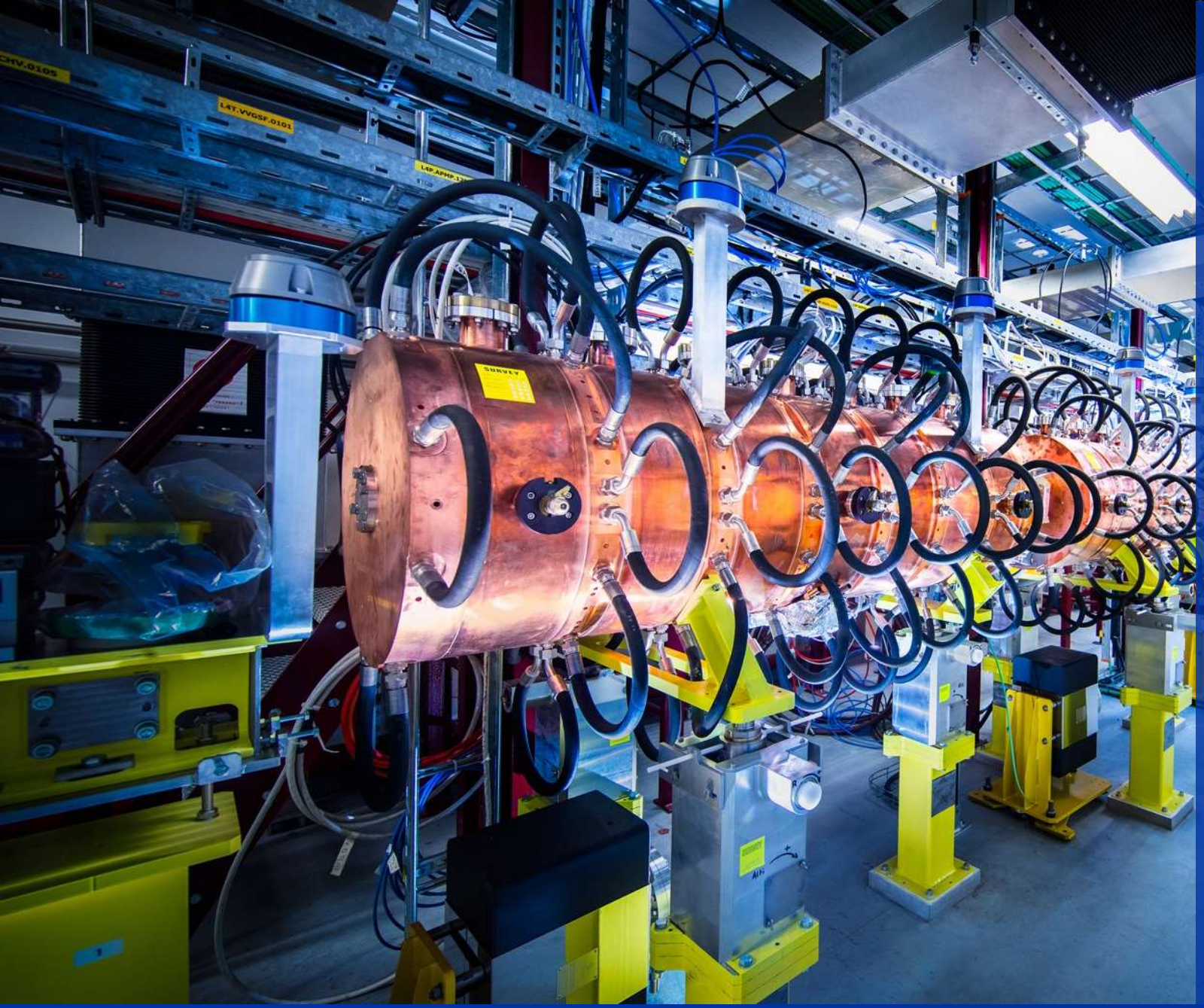
Description & Specific Condition :

Design, manufacturing of distribution panels and ATEX cabinets, dismantling of old pipes and racks, installation of distribution panels and ATEX cabinets, modification and update of the cabling, testing and commissioning.

Key requirements:

- Have a proven experience and competence in applying the norm EN 13480,
- Have welders with valid qualifications from 10mm to DN25
- Be able to provide a complete welding book with pipe inspection report
- Have at least 10 years of experience in the field of the installation of gas distribution systems, high purity gas
- Already have prepared a pressure test qualification
- Be able to work in near or in ATEX area and have the associated training

Start of the Contract: Q4 2025
Installation and commissioning to be completed by end 2027



Electronics, Radiofrequency

Custom designed PCIe based fibre optics I/O cards (MS-5040/EP)

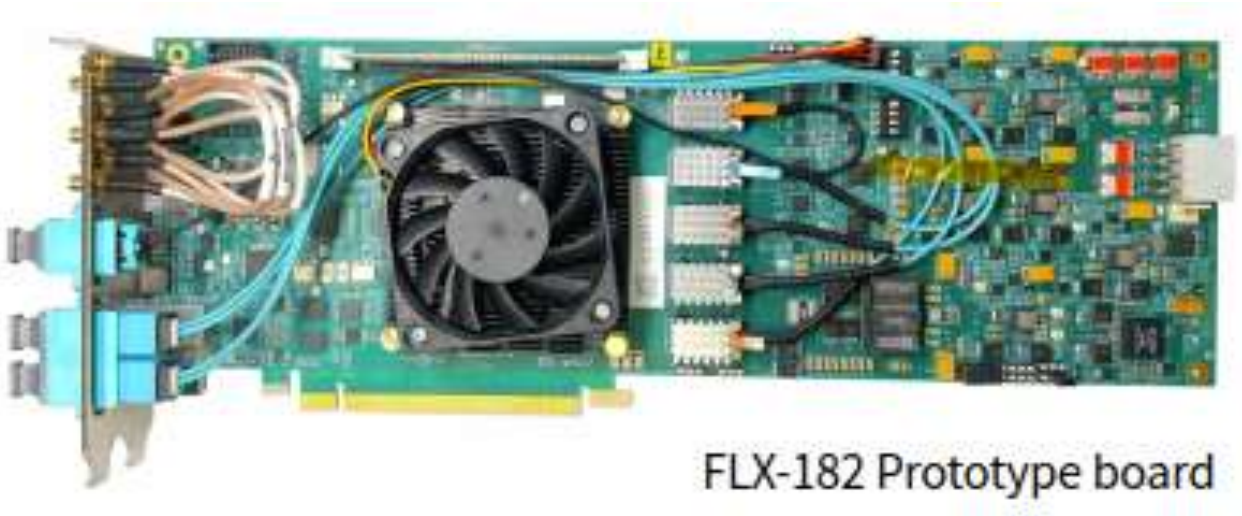
Procurement Code: 03 04 09 00 (PCI, PCIe modular electronic boards)

Cost Range : 400 K – 1.5 M CHF

Planning: MS : Q4 2024 - published
IT: Q2 2025

Scope:
Assembly and testing of approx. 800 PCBs

- Versal Prime VP1552 FPGA
- PCIe Gen5 x16
- Up to 52 optical links, link speed up to 25 Gb/s
- Overall PCB dimensions: 311.99 x 106.65 m
- 24 layers and a thickness of (3.00 ± 0.28) mm
- PCB material is EM980K



FLX-182 Prototype board

Duration: Production over 12 months

Eligible Firm Profile: Interested firms shall have proven experience and competence in assembly and test of PCBs of the complexity required. At least 50% shall originate in FR, DE, IL, IT, NL, RO, CH, US.

Contact: Carlo.Alberto.Gottardo@cern.ch

HL-LHC Crab cavities RF Circulators & Loads (MS-5030/SY/HL/LHC)

- **Description & Specific Condition :**

Supply of 18 x circulators for the HL-LHC Crab cavities.

Key conditions:

- Design & manufacturing expertise : CERN will provide a functional specification and the Contractor shall design and manufacture accordingly (Detailed Design File to be approved by CERN)
- Capacity to manufacture 18 units in approximately in less than 3 years
- Proven experience with circulators and loads for High Power RF Systems

Start of the Contract: Q1 2025

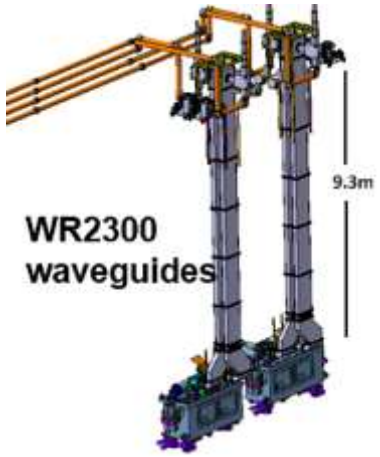
Procurement Code: 03 06 01 00

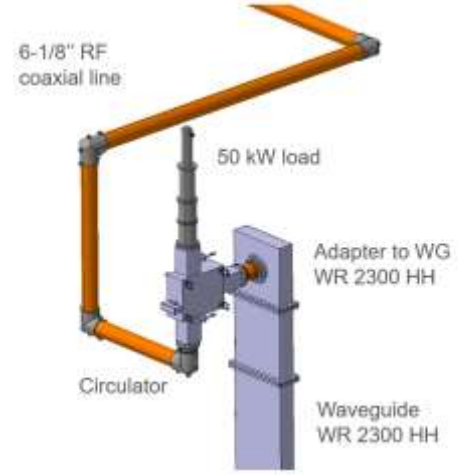
Cost Range : 750 kCHF ⇔ 5 MCHF

Planning: MS: published

IT: Q2 2025

Contact: gino.cipolla@cern.ch





HL-LHC Crab cavities HPRF stations (MS-5024/SY/HL/LHC)

Description & Specific Condition :

Supply of 18 HPRF stations (High Power Radio Frequency station) powering IOTs for the HL-LHC Crab cavities.

Key conditions:

- Design and Manufacturing expertise in HPRF equipment
- Capacity to produce the systems in the required timeframe; delivery in batches over 2 years from the start of the contract. Commissioning foreseen in Q2 2027

Start of the Contract: Q3 2025

Procurement Code: 03 06 01 00

Cost Range : 5 MCHF ⇔ 10 MCHF

Planning: MS: published

IT: Q2 2025

Contact: gino.cipolla@cern.ch

400.8MHz Waveguide Junction Circulators and Ferrite Loads for HL-LHC (MS-5065/SY/RF)

- **Description & Specific Condition :**

Supply of 18x 400MHz Waveguide Junction Circulators and Ferrite Attenuator Segments

Key conditions:

- Design expertise in high-power microwave ferrites devices
- Manufacturing and testing of high-power microwave ferrite devices, including circulators and loads.
- In-house manufacturing facilities
- Capacity to manufacture 10 high power RF components per year over the last three years

Start of the Contract: Q3 2025

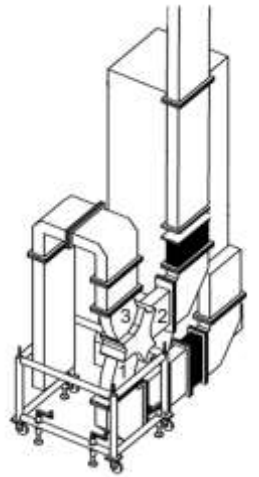
Procurement Code: 03 02 13 00

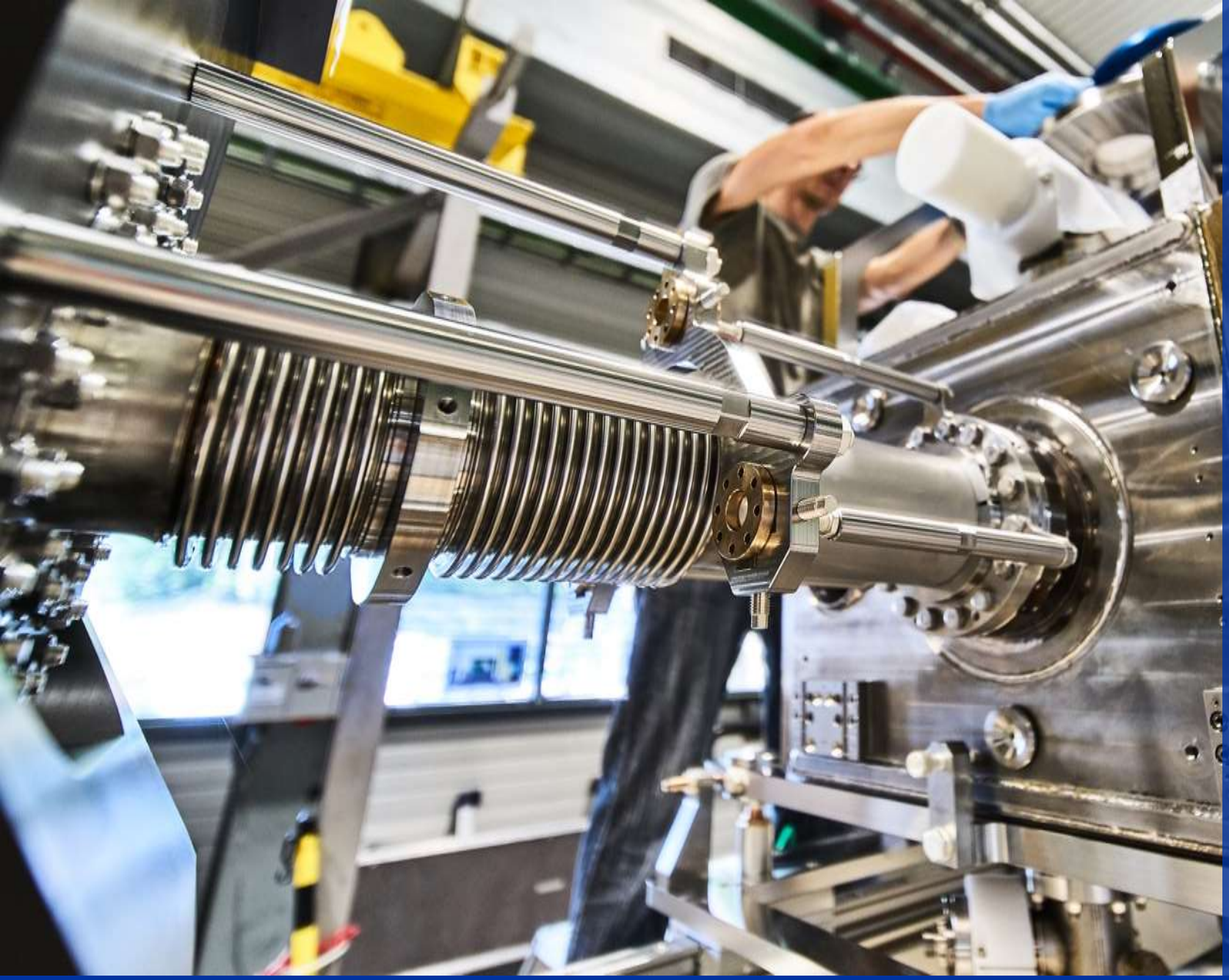
Cost Range : 5 MCHF ⇔ 10 MCHF

Planning: MS: published

IT: Q2 2025

Contact: **chiara.marrelli@cern.ch**





Mechanical Engineering, Raw Materials

Stainless-steel sheets and plates EN 1.4429 AISI 316LN for Ultra-High Vacuum applications (MS-5056/SCE)

Procurement Code: 05 01 01 02 (Stainless Steel)

Cost Range : 1,5M – 5M CHF

Planning: MS : published
IT: Q2 2025
Contract start: 1 October 2025

Scope:

- Supply of 80T stainless steel sheets and plates;
- EN 1.4429 AISI 316LN (Electroslag Remelting ESR)

Duration: 5 years

Eligible Firm Profile: Interested firms shall have proven experience and competence in metallurgy, manufacturing, forging and testing of the above-mentioned material.

Contact: Leila.akhouay@cern.ch

Stainless-steel sheets and plates EN 1.4306 AISI 304L for High Vacuum applications (MS-5054/SCE)

Procurement Code: 05 01 01 02 (Stainless Steel)

Cost Range : 400K – 1,5M CHF

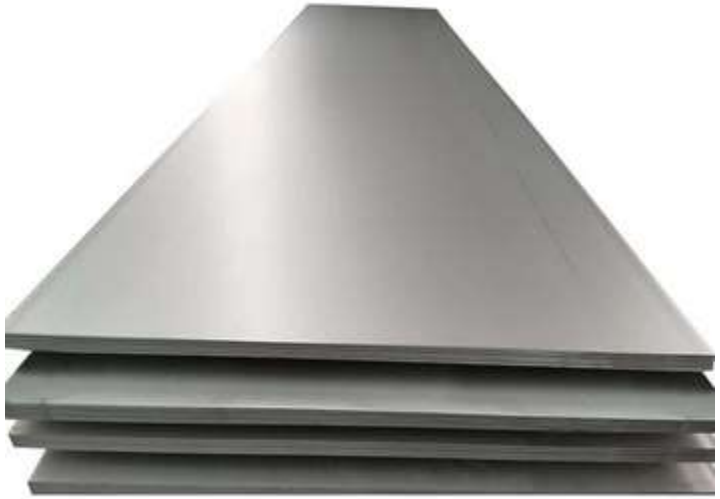
Planning: MS : Q2 2025
IT: Q3 2025
Contract start: 1 October 2025

Scope:

- Supply of 70T stainless steel sheets and plates;
- EN 1.4306 AISI 304L

Duration: 5 years

Eligible Firm Profile: Interested firms shall have proven experience and competence in metallurgy, manufacturing, forging and testing of the above-mentioned material.



Contact: Leila.akhouay@cern.ch

Cu-OFE (Oxygen-Free Copper) sheets and plates for Ultra-High Vacuum applications (MS-5057/SCE)

Procurement Code: 05 01 01 03 (Copper)

Cost Range : 400K – 1,5M CHF

Planning: MS : Q2 2025
IT: Q3 2025
Contract start: 1 October 2025

Scope:

- Supply of 50T Oxygen- Free Electronic copper (UNS C10100) Grade 1, according to ASTM B224 with a maximum oxygen content of 5ppm

Duration: 5 years

Eligible Firm Profile: Interested firms shall have proven experience and competence in metallurgy, manufacturing, forging and testing of the above-mentioned material.

Contact: Leila.akhouay@cern.ch

CuCr1Zr blanks for XTAX (MS-5074/BE)

Procurement Code: 05 01 03 03 (Copper, copper alloys)

Cost Range : 400K – 1,5M CHF

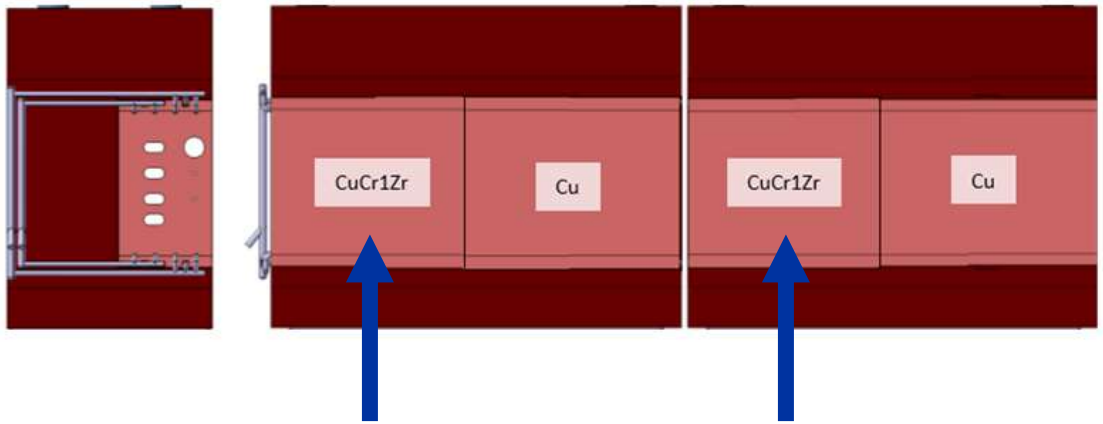
Planning: MS : Q2 2025
IT: Q3 2025
Contract start: Q4 2025

Scope:

- Supply of forged CuCr1Zr blanks in various shapes and sizes
- Material: CuCr1Zr CW106C according to EN 12420, multi-directional forged, solution annealed, and precipitation hardened. Delivered in temper H120 (according to EN 12167).
- Overall tolerances: ISO2768 – cL
- Delivery by July 2026

Eligible Firm Profile:

Interested firms shall have proven experience and competence in forging, machining, and material testing and certification.



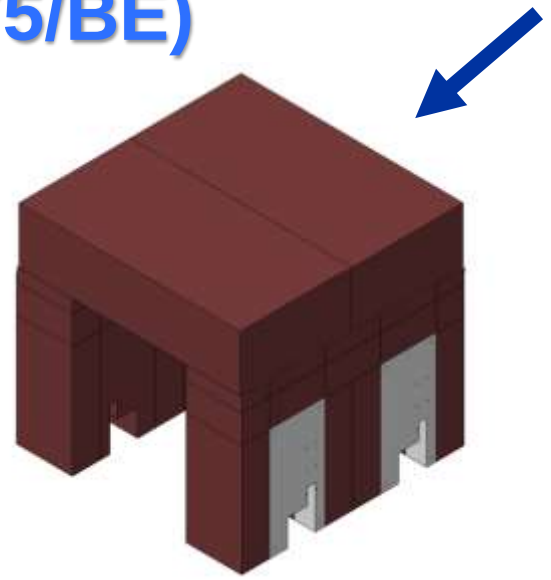
6x DIMENSIONS : 300x810x420 mm³

2x DIMENSIONS : 800x810x420mm³

1x DIMENSIONS : 300x800x170mm³

Contact: miguel.lino@cern.ch

Cast Iron for XTAX (MS-5075/BE)



Procurement Code: 05 01 04 01 (Cast iron, steel)

Cost Range : 1,5M CHF – 10M CHF

Planning: MS : Q3 2025
IT: Q1 2026
Contract start: Q3 2026
Delivery by end 2027

Scope:

- Supply of 410 T of Cast Iron Blocks machined in various shapes and sizes.
- Main materials: Nodular Iron GJS – 400-18U-RT, acc. to EN 1563
- Paint: Primer anti-radiation: Inorganic zinc silicate; 2nd layer epoxy coat; (3rd layer red 3005)
- Overall tolerances: ISO2768 - cL

20x DIMENSIONS : 500x380x2100 mm³

20x DIMENSIONS : 500x820x2100 mm³

14x DIMENSIONS : 500x785x2100 mm³

7x DIMENSIONS : 3200x1600x800 mm

1x DIMENSIONS : 490x3230x657 mm³

1x DIMENSIONS : 300x3230x440 mm³

Eligible Firm Profile:

Interested firms shall have proven experience and competence in casting, machining, and material testing and certification.

Contact: miguel.lino@cern.ch

Tables for XTAX (MS-5076/BE)

Procurement Code: 05 01 01 04 (Aluminium, aluminium alloys)

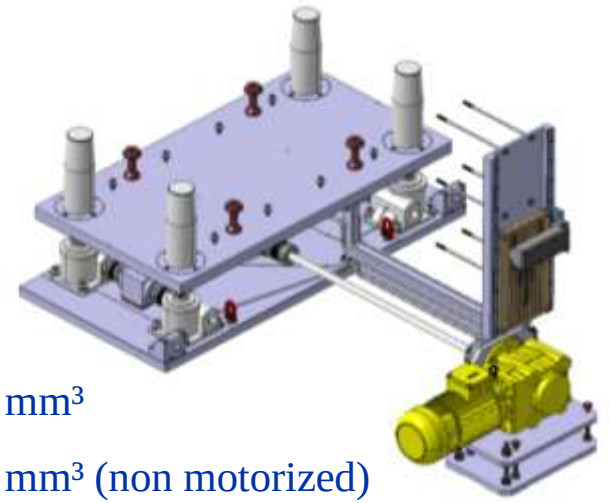
05 01 01 02 (Stainless steel)

Cost Range : 400K – 1,5M CHF

Planning: MS : Q1 2026

IT: Q2 2026

Contract start: Q3 2026, delivery by May 2027



QTY: 8; DIMENSIONS: 1616 x 780 x 832 mm³

QTY: 1; DIMENSIONS: 3200 x 780 x 832 mm³ (non motorized)

Scope:

- Supply of alignment tables which are a Z displacement (300 mm) device, designed to support and lift 15T of operational load with all controls and driving systems placed outside the table footprint.
- Stroke: +/-150 mm; Operational Load 12 T; Speed: 100 mm/min
- Each table is equipped with a manual alignment system on its base providing 5 DOF with the following specifications:
- Resolution: 0.1mm; Stroke: y: +/- 5 mm; Z: +/- 3mm; Rx: +/- 7 mrad; Ry: +/- 7 mrad; Rz: +/- 7 mrad
- Main materials: AL EN AW6082, Stainless Steel A4, Stainless Steel 304
- General machining tolerances ISO2768 – mk
- All commercial components must be radiation hard > 100kGy in 20 Yrs.

Eligible Firm Profile

Contact: miguel.lino@cern.ch

Interested firms shall have proven experience and competence in machining, precision assembly, and metrology and material testing and certification.

Information Technology

Human Capital Management (HCM) Implementation Services (MS-5061/FAP)

Procurement Code: 04900200 (Software Development Consultants)

Cost Range : 400k – 5M CHF

Planning: MS : Q3 2025
IT: Q4 2025
Contract start: 1 May 2026

Scope:

- Provision of agile HCM Suite implementation services (tool vendor to be determined in preceding tendering procedure).

Duration: 3 years

Eligible Firm Profile:

- Interested firms shall have proven competence and experience in implementing HCM/ERP solutions in replacement of an existing system.
- They shall be certified implementation partners for the HCM solutions they wish to be considered for.

Contact: Oana.Liteanu@cern.ch, Jan.Janke@cern.ch

Supply and installation of audio-visual equipment

Procurement Code: 04040000

Cost Range : 1.5M – 5M CHF

Planning: MS : Q2 2025
IT: Q3 2025
Contract start: 1 January 2026

Scope:

- Supply and installation of equipment for around 75 conference rooms including three auditoriums
- Includes system schematics, rack layouts, cabling schedules, room layouts

Duration: 3 years, blanket purchase contract

Eligible Firm Profile:

- Interested firms shall have proven competence and experience in supplying AV and videoconferencing equipment

Contact: Olof.Barring@cern.ch

Construction, Onsite & Offsite Services

Construction of new Building 140

Description & Specific Conditions :

General contractor to construct new Building 140 on CERN's Meyrin site in Switzerland.

Highly-performing mechanical, electrical, plumbing (MEP) and façade system to achieve recognised sustainability accreditation.

The building will provide a new council chamber, EP workshops, a learning centre and media facilities and will be constructed in two phases

Procurement code: 01 02 01 00/ 01/ 02

Cost Range : > 10M CHF

Planning: MS Q3 2025 / IT Q1 2026

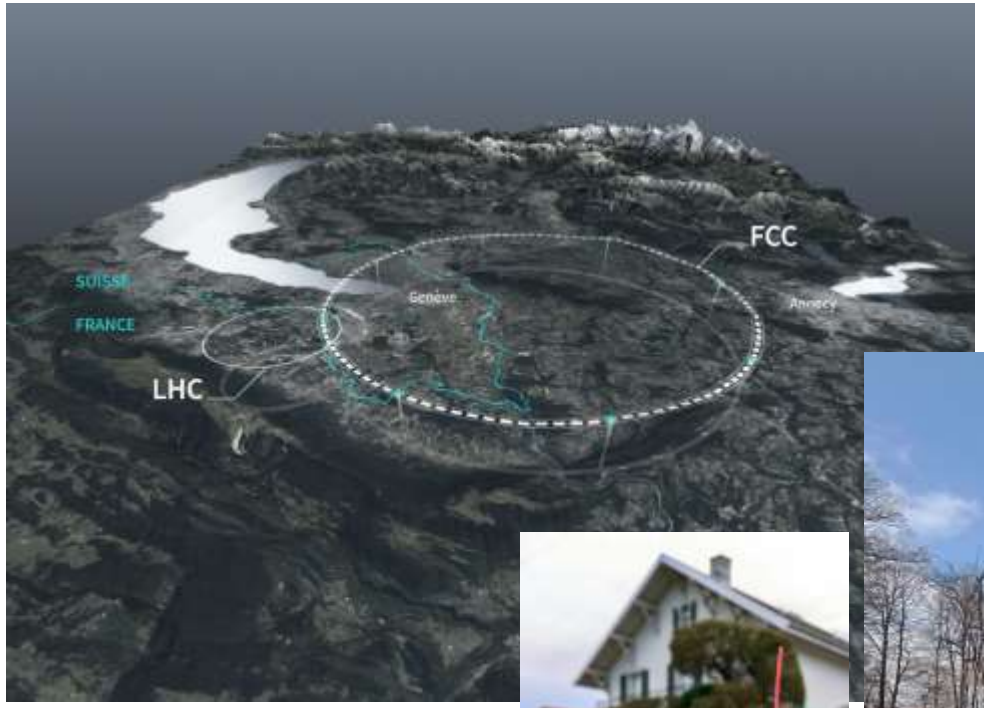
Contact: **baptiste.mercier@cern.ch**

Consulting engineering services for FCC Site Investigations

Description & Specific Conditions :

Appointment of a consultant for the provision of engineering services to prepare design and specifications in readiness for the **potential second phase** of FCC site investigations

Scope of services includes geotechnical and civil engineering as well as environmental and permitting aspects and associated reporting



Procurement code: 01 01 01 00; 01 90 04 03; 01 90 01 02

Cost Range : 5M – 10M CHF

Planning: MS Q2 2025 / IT Q3 2025

Contact: **Roderick.cunnigham@cern.ch**

Health & Safety

Supply of three utility vehicles (MS-5083/HSE)

Description & Specific Condition :

- **Three utility vehicles to be delivered over a three- year period (2026-2028)**
  - 1x Flexi Unit in 2026
  - 1x Officer unit in 2027
  - 1x Flexi unit in 2028
- **Vehicles must be suited to transport fire and rescue equipment**
- **Be equipped with an automatic gearbox**

Procurement Code: 11 01 04 01 (Fire engines)

Cost Range : 400 kCHF - 1.5 MCHF

Planning: MS: Q2 2025 IT: Q3/4 2024

Contact: Miikka.Leinonen@cern.ch

AI at CERN in Research

Artificial Intelligence at CERN in Research

Machine Learning has been used at CERN since the 1990s

Since early 2000s Deep Learning provides powerful techniques, applicable to a wide range of use cases

Data processing for LHC experiments :

- Anomaly detection and real time data selection
- Data analysis and pattern recognition
- Synthetic data generation and simulation

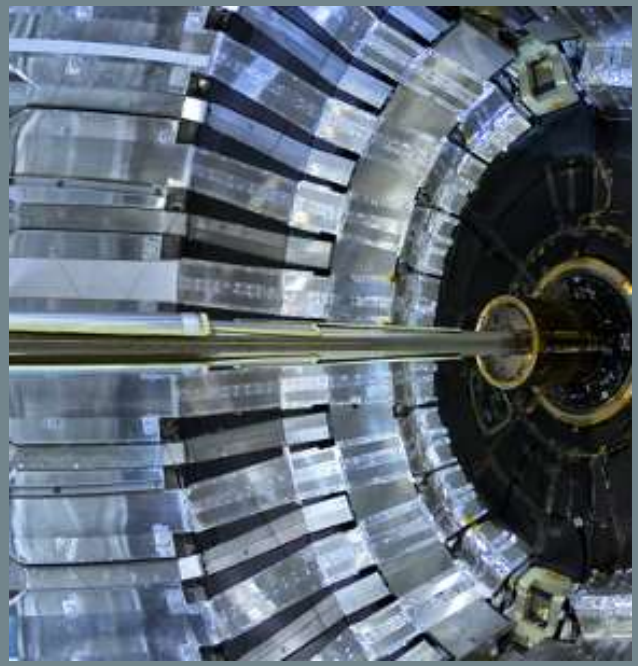
Operations and research in the field of particle accelerators

Engineering and Infrastructure

- Robotics and computer vision

NB:

None of the above applications triggers (Personal) Data Protection issues



AI-based real time data selection:

In just a few microseconds, the complex system can determine whether the information about a given collision event is worth keeping or not.

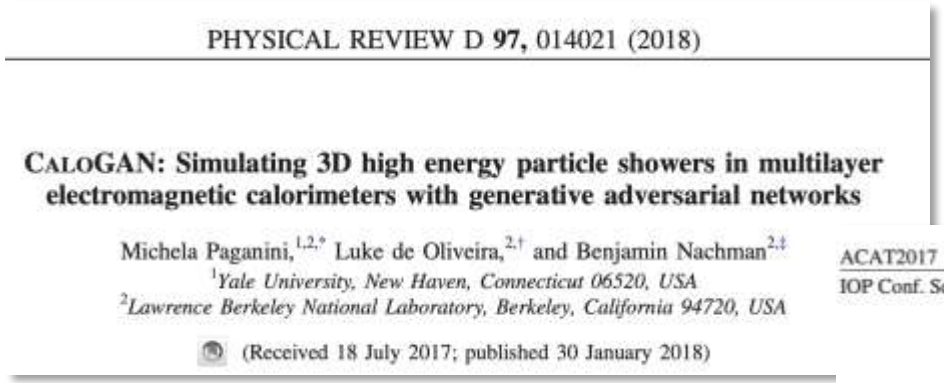
Ex. Generative Models in HEP

Generative AI today «translates to LLMs» but it is actually a much broader class:

Boltzmann Machines exist since the 1980s

and in HEP we have used them since 2014!

Ex. CaloGAN (2017), 3DGAN (2017)…



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CALOGAN: Simulating 3D high energy particle showers in multilayer electromagnetic calorimeters with generative adversarial networks

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Generative models for fast simulation

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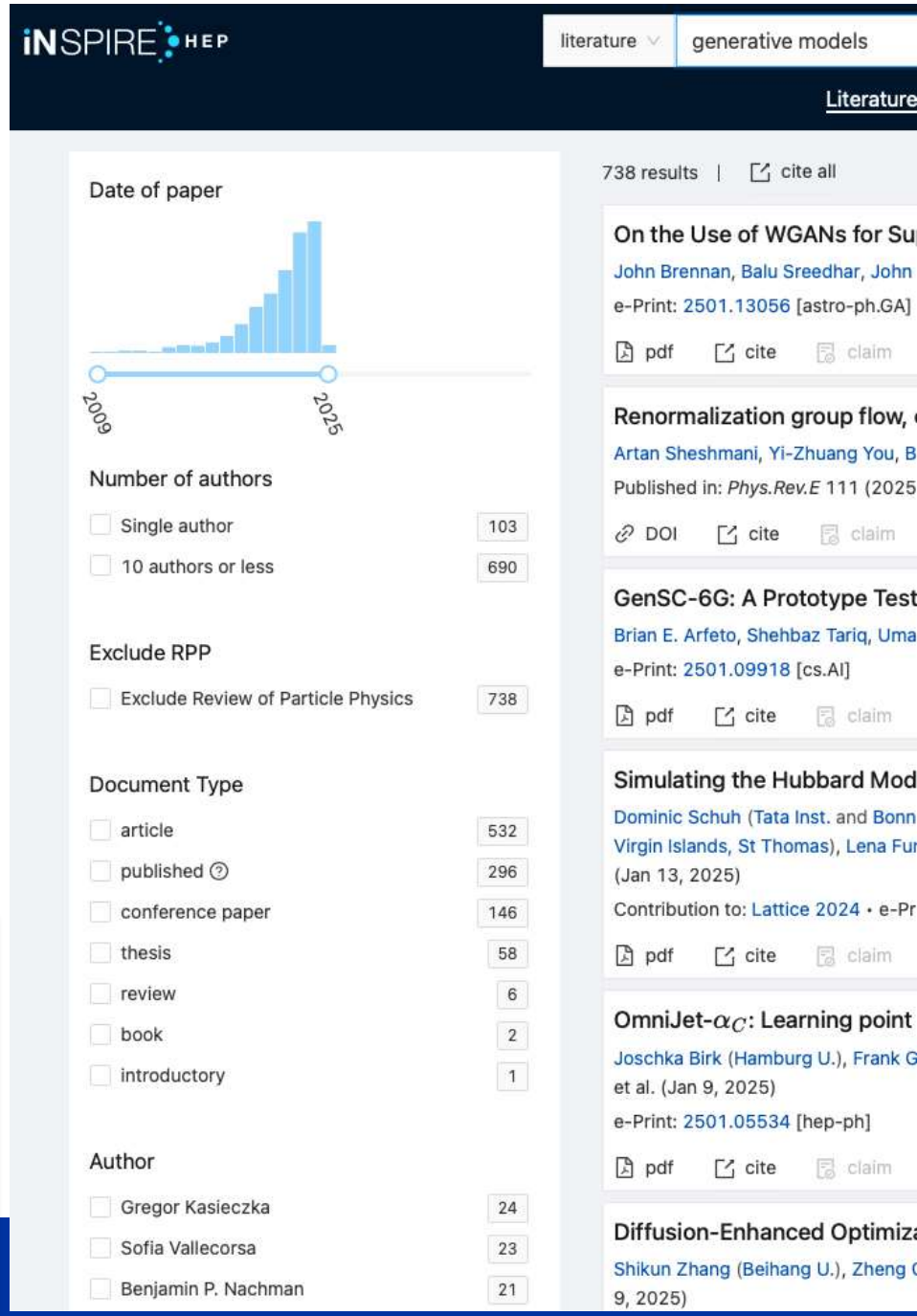


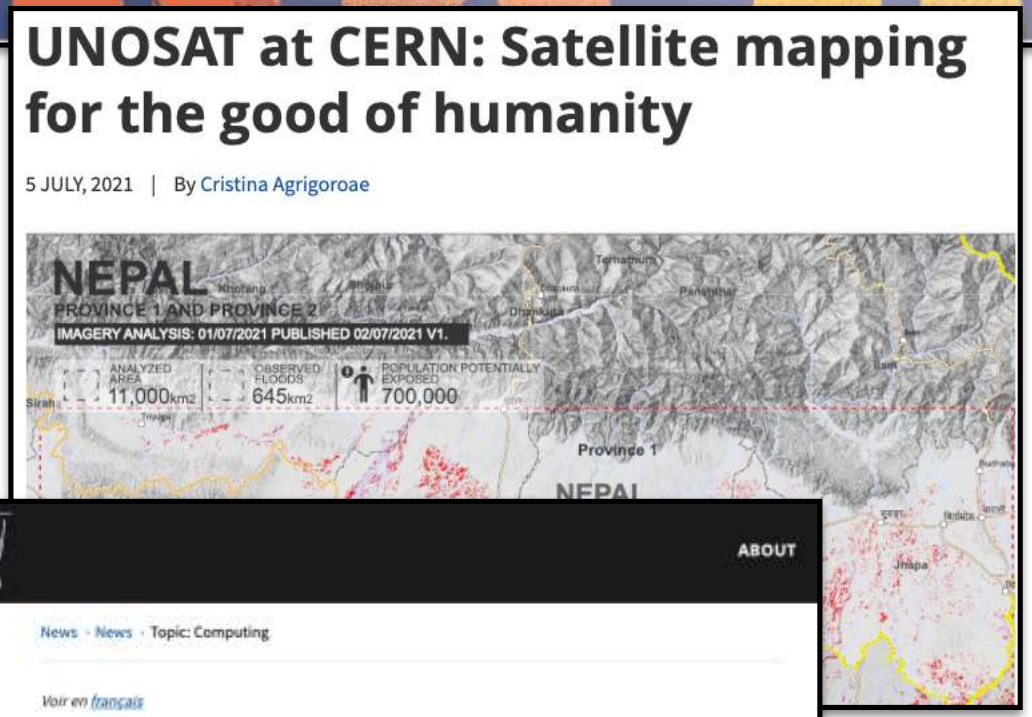
AI for humanity at CERN

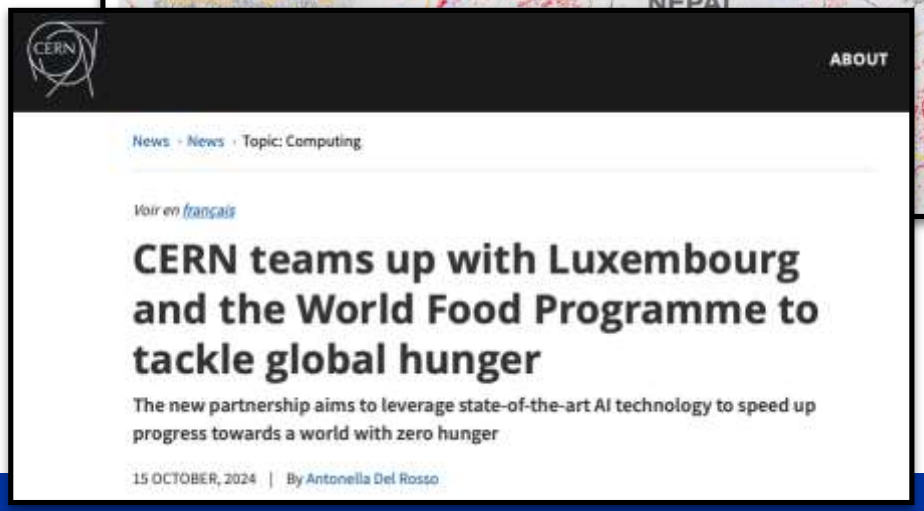
“Unite people from all over the world to push the frontiers of science and technology, for the benefit of all”

from the CERN mission statement

CERN builds collaboration with humanitarian agencies and takes concrete actions to support human rights

- ARIA project with WHO
- AI-based satellite image analysis with UNOSAT (UNITAR)
- Most recently, new collaboration with Luxembourg, LIST and WFP on a series of AI based tools to help improving WFP operations





AI strategy at CERN

Setup an AI Initiative coordinating different issues related to scientific AI applications development and AI use for productivity & efficiency

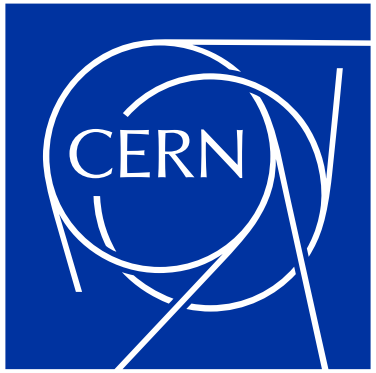
In particular addressing the need for policies, strategy and data privacy risks

Scientific applications at CERN do not suffer from the same kind of risks limiting application in other domains (e.g. AI for Human Right report)

Biases, performance and systematic errors are fully evaluated and characterized during the R&D process by design

Introduction of AI-based assistants to improve productivity at different levels for non-scientific tasks require addressing risks as in any other organisation

Thank you



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