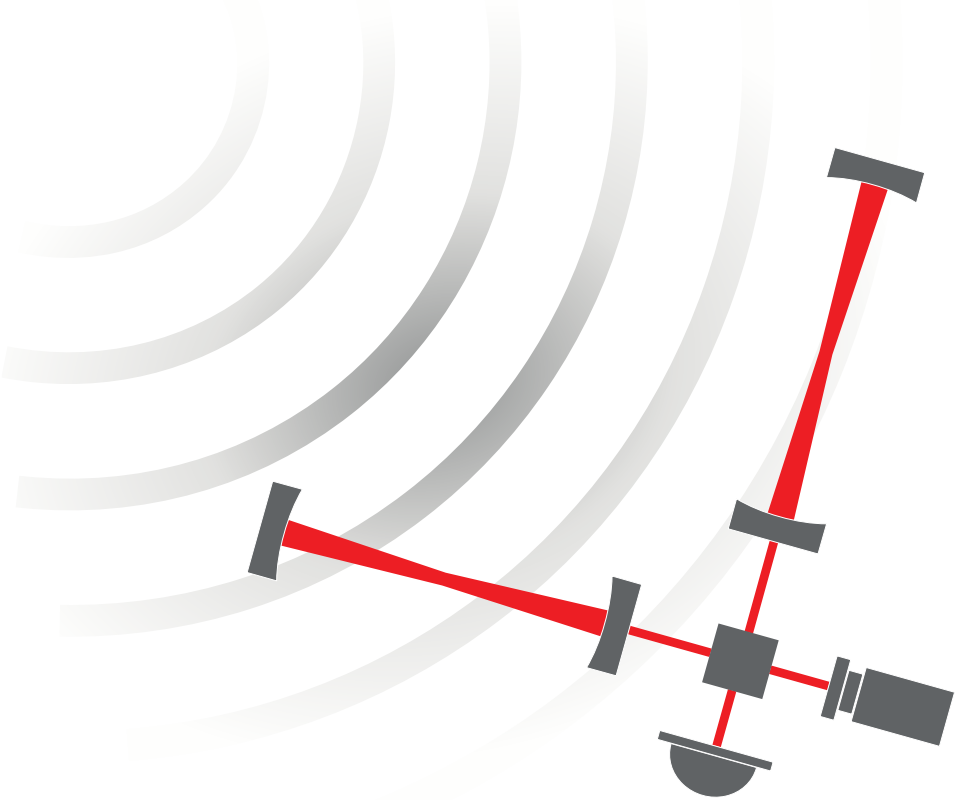
WP5 update



Freise, Saban, Flaminio, Variola, Werneke 11.12.2023

WP5 Outline

a short reminder of the objectives and the plan for

- The Project Office
- The Engineering Department

the progress so far

- Where are we today with the PO and the ED
- The investigations for a possible collaboration with CERN on a number of topics

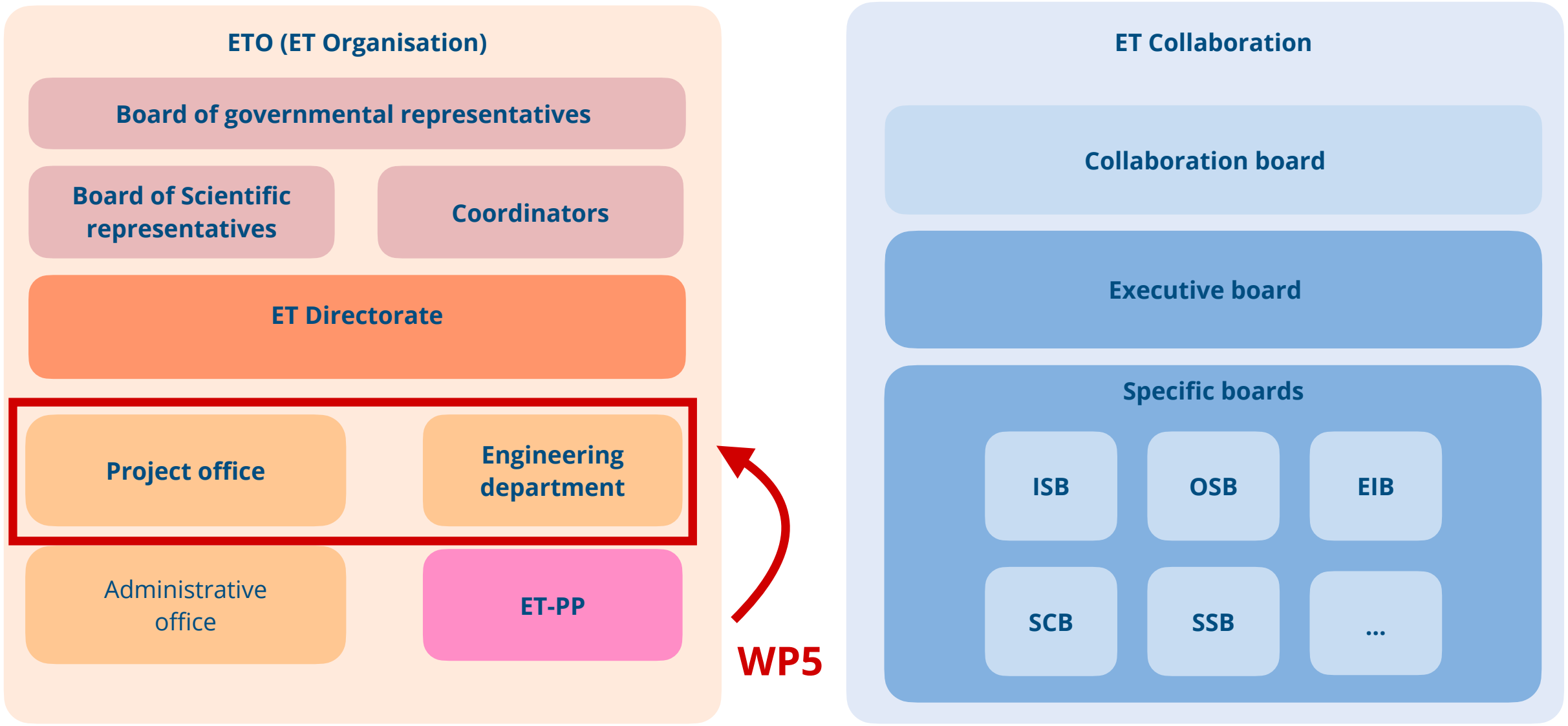
where do we go from here

The context

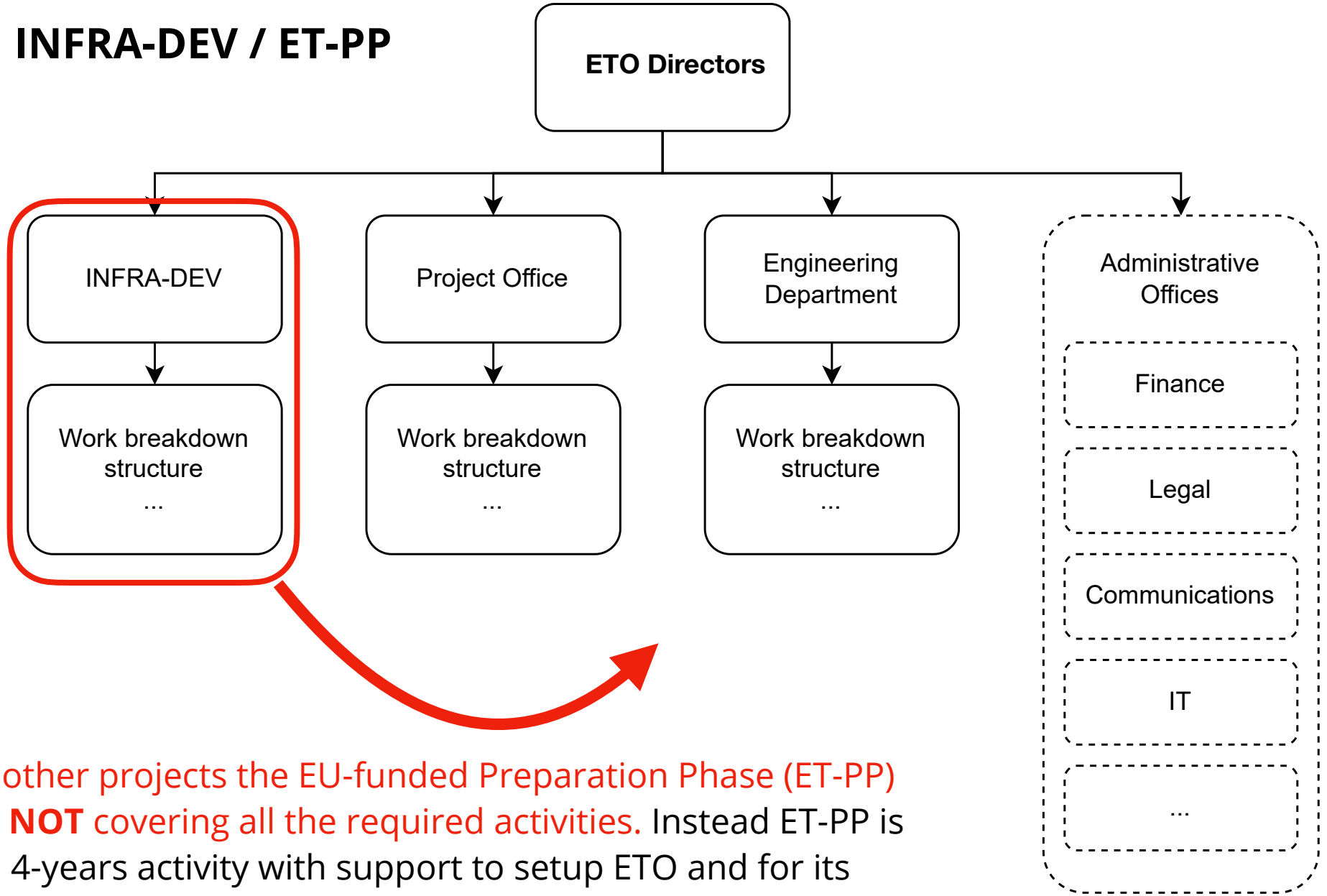
1 We are in the process of creating a **research infrastructure** complete with a governance, a collaboration of scientists, the procurement service, the resource management, the technical and the engineering departments, etc.

2 Which in turn has the **project** of designing, procuring, installing, building, commissioning and operating a **gravitational wave detector with all the associated technical and infrastructure systems**

Two international pillars of ET:
1) project management and 2) scientific collaboration



Note on INFRA-DEV / ET-PP



Unlike in other projects the EU-funded Preparation Phase (ET-PP) project is **NOT** covering all the required activities. Instead ET-PP is seen as a 4-years activity with support to setup ETO and for its activities.

The Goal of the Project Office

Guarantee, that the as built research infrastructure, comprising

- the gravitational wave detector
- the technical systems
- the infrastructure systems

fully complies with

- the requirements
- the parameters
- the layout

detailed in the Technical Design Reports

- **without having undergone changes which were not endorsed by the stakeholders**
- **within the schedule and the budget**

The three Pillars of the Project Office

The Project Office needs the following three Project Management pillars to be able to fulfil its mandate:

1. The Configuration PBS, Requirements, Design, Parameters, Layouts, TDR
2. The Schedule WBS, Risk register, Financial Plan
3. The Cost Estimate PBS, WBS, TDR, Risk register, Financial plan

Courtesy Alessandro Variola

Formal project management: PBS

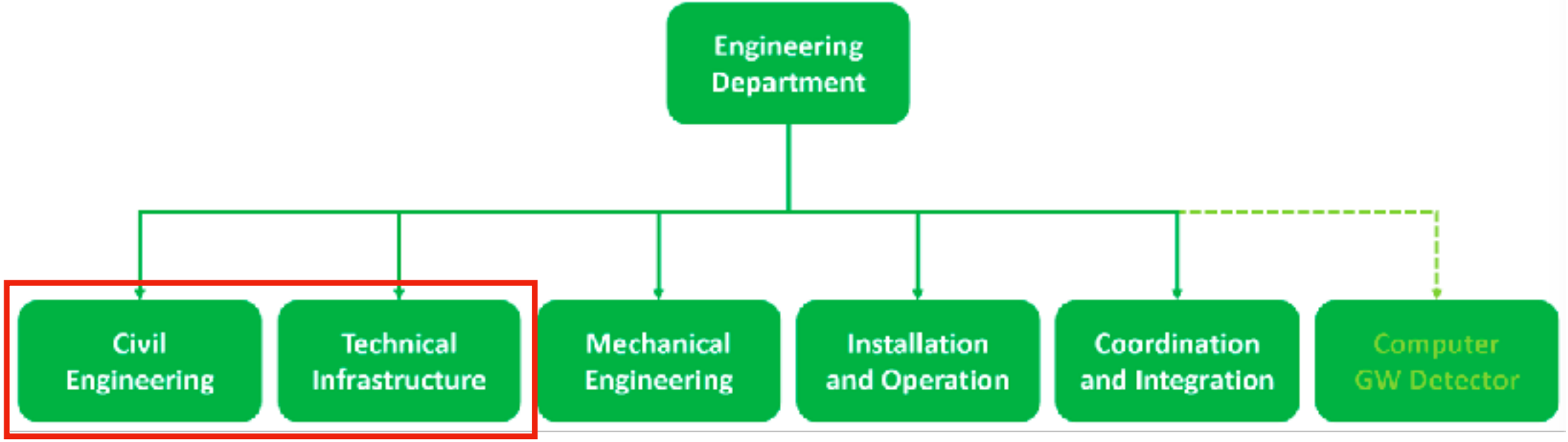
- Following the initiative from the project office, an ad-hoc working group was appointed
- Made of both PO and Collaboration members (Mandate/Composition - ET-0026A-23), the WG met (mostly) in presence four times in different locations with monthly cadence. All presentations and meetings executive summaries available in the ET Wiki: https://wiki.et-gw.eu/Main/PBSWorkingGroup/WebHome
- The Product Breakdown Structure (PBS) is a first step in a formal project management process:
  - PBS will define the structure of the requirements and consequently of the configuration
  - PBS shall represent the backbone of the WBS (Work Breakdown Structure)
  - PBS is triggering the OBS (Organization Breakdown Structure) via the definition of the WBS
  - PBS shall produce the Hardware Project Object costing

Reminder: the mission of the Engineering Department

The Engineering Department will **design, procure, install, commission, operate, maintain and, eventually, dismantle**

1. **the special systems** (e.g. vacuum, cryo, etc) associated with the gravitational wave detector, and
2. **the technical infrastructure systems needed to operate the interferometer** (e.g. civil engineering, cooling, ventilation, electricity distribution)

Civil engineering and technical infrastructure



- **We are working with CERN** to get support from their team for these topics. For most topics the CERN teams do not have the capacity to write the TDRs, but can help as consultants.
- Major parts of the design require the involvement of companies. We need to have in-house expertise in order to define the required work and to write correct tenders.
- This also requires coordination between the ET Collaboration, ETO and the national teams doing technical work for preparing the candidate sites.

Working with CERN

- **Vacuum tube**: A first appendix to a basic MOU (CERN, INFN, Nikhef, IFAE) describes a first joint work that started in 2022: a team led by CERN will deliver the Technical Design Report (TDR) for the vacuum pipe in 2025.

- **Civil engineering**: an extension to the MOU has been agreed on and is now being formalised: CERN will provide consultancy and technical support towards the creation of the TDR for the civil engineering and technical infrastructure. That project has started in fall 2023 and runs for 3 years.

- **Health and safety**: technical designs at CERN are usually done by a large interdisciplinary team, including for example the safety group. we had a first exploratory meeting with CERN's Occupational Health & Safety and Environmental Protection Unit (HSE) on 04.04.2023. To be continued.

- **Engineering support**: we are organising a first meeting with Katy Foraz, the Head of the Engineering Department at CERN, and her Group Leaders to explore other opportunities for collaboration. Several detailed meetings are taking place these weeks.

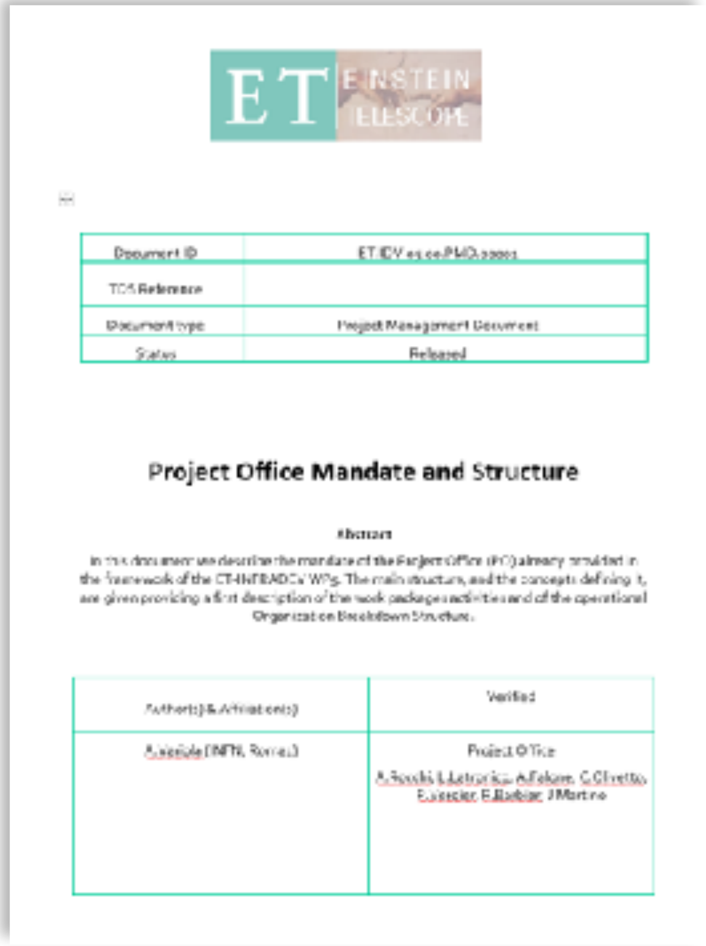
- **Document management**: project management requires specific tools, we are investigating the use of the CERN tool EDMS. Hosting and support could be add/by CERN or from another partner.

Milestones and Deliverables

The deliverables and a few milestones

WP5-D1	A document which defines the structure and the mandate of the Project Office.	
WP5-D2	A document describing the functionalities required from the tools in support of the project management activity used across all the project units	
WP5-D3	A document containing the structure and the mandate of the Engineering Department.	
WP5-M1	The recruitment of the Project Office team (both junior and senior) and the key figures of the Engineering Department is completed	31 Dec 2023
WP5-M2	All three documents (WP5-D1, D2 and D3) are published in their final version	1 Oct 2024
WP5-M3	The Engineering Department as a functional unit complete with key figures operational, mission statement and budget is created	31 Dec 2024
WP5-M4	The Project Office as a functional unit complete with manpower, mission and budget is operational	31 Dec 2024

The deliverables of the Project Office



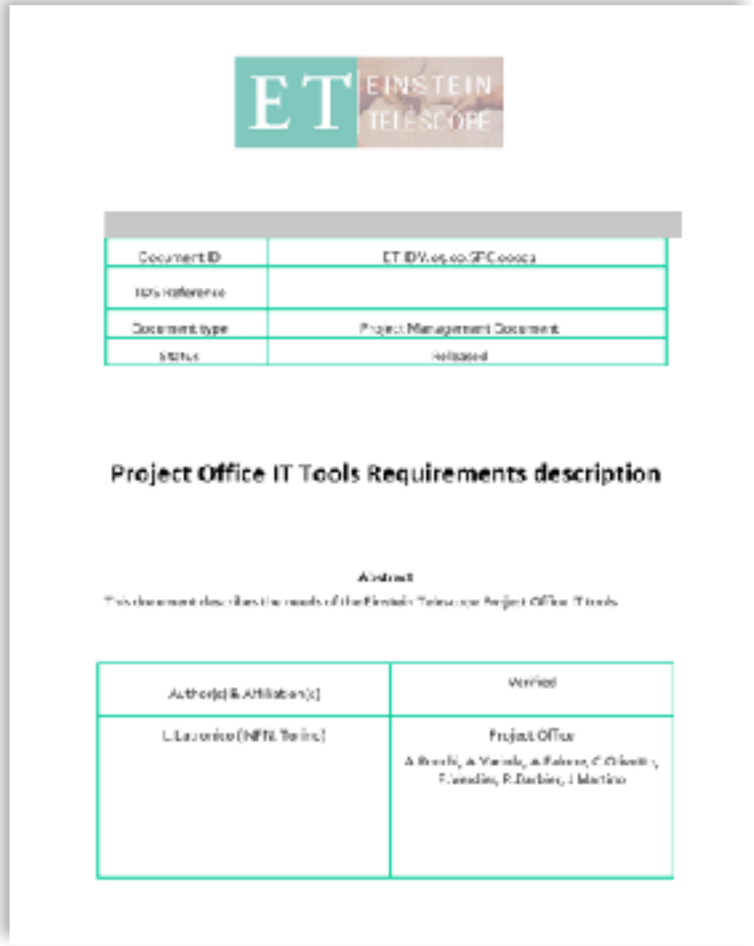
Document ID	[illegible]
TDS Reference	
Document type	Project Management Document
Status	Released

Project Office Mandate and Structure

Abstract

In this document we describe the mandate of the Project Office (PO) already provided in the framework of the ET-INFRADEV WPs. The main structure, and the concepts defining it, are given providing a first description of the work packages activities and of the operational Organization Breakdown Structure.

Author(s) & Affiliation(s)	Verified
[illegible] (INFN, Roma1)	Project Office [illegible]



Document ID	[illegible]
TDS Reference	
Document type	Project Management Document
Status	Released

Project Office IT Tools Requirements description

Abstract

This document describes the needs of the Einstein Telescope Project Office IT tools.

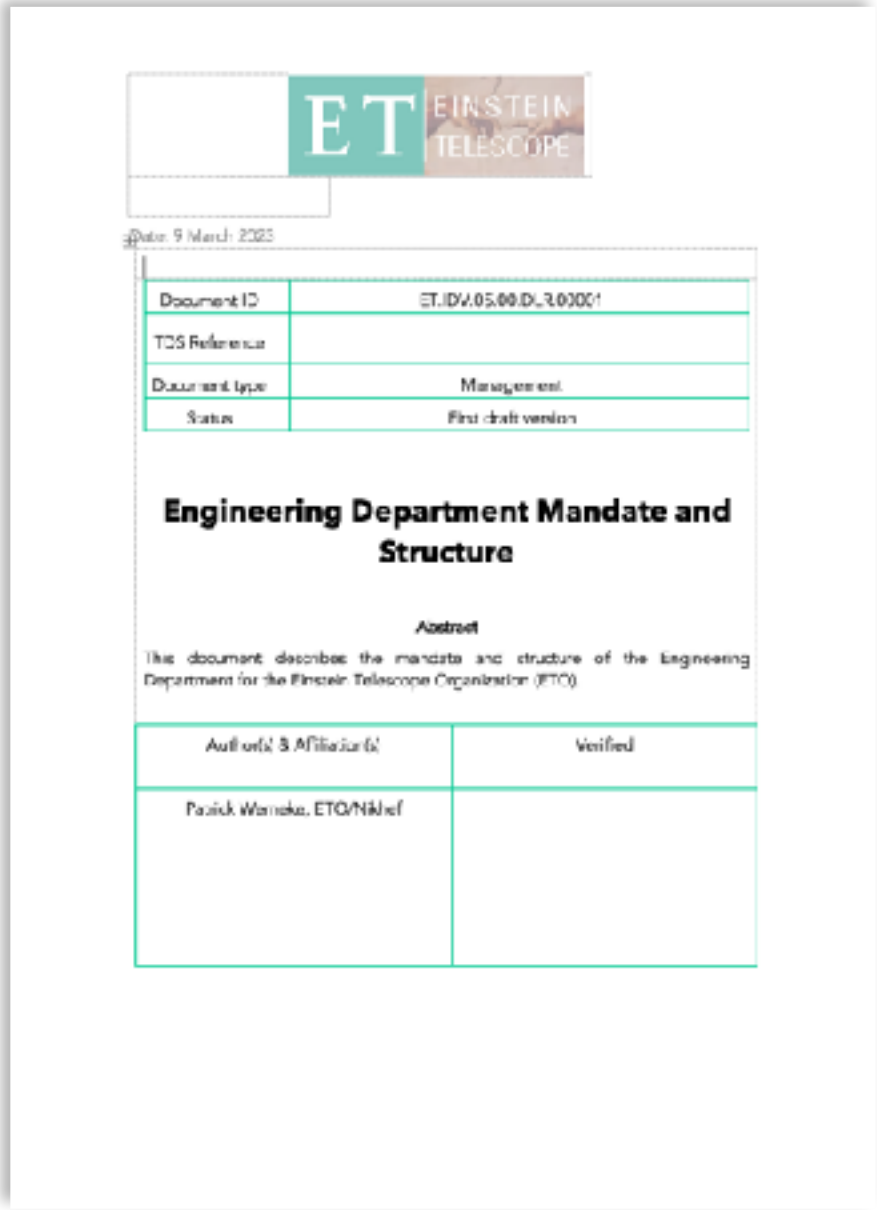
Author(s) & Affiliation(s)	Verified
[illegible] (INFN, Torino)	Project Office [illegible]

The fields of competence of the ED

Access Control
Cooling
Cryogenics
Electricity Distribution
Site Monitoring
Vacuum
Ventilation

Civil Engineering
- Surface
- Underground
- Shafts

Mechanical Engineering
Technical Coordination in the Field
Transport and Handling



ET EINSTEIN TELESCOPE

Date: 9 March 2023

Document ID	ET-DV-05.00-D_3.0000
TDS Reference	
Document type	Management
Status	First draft version

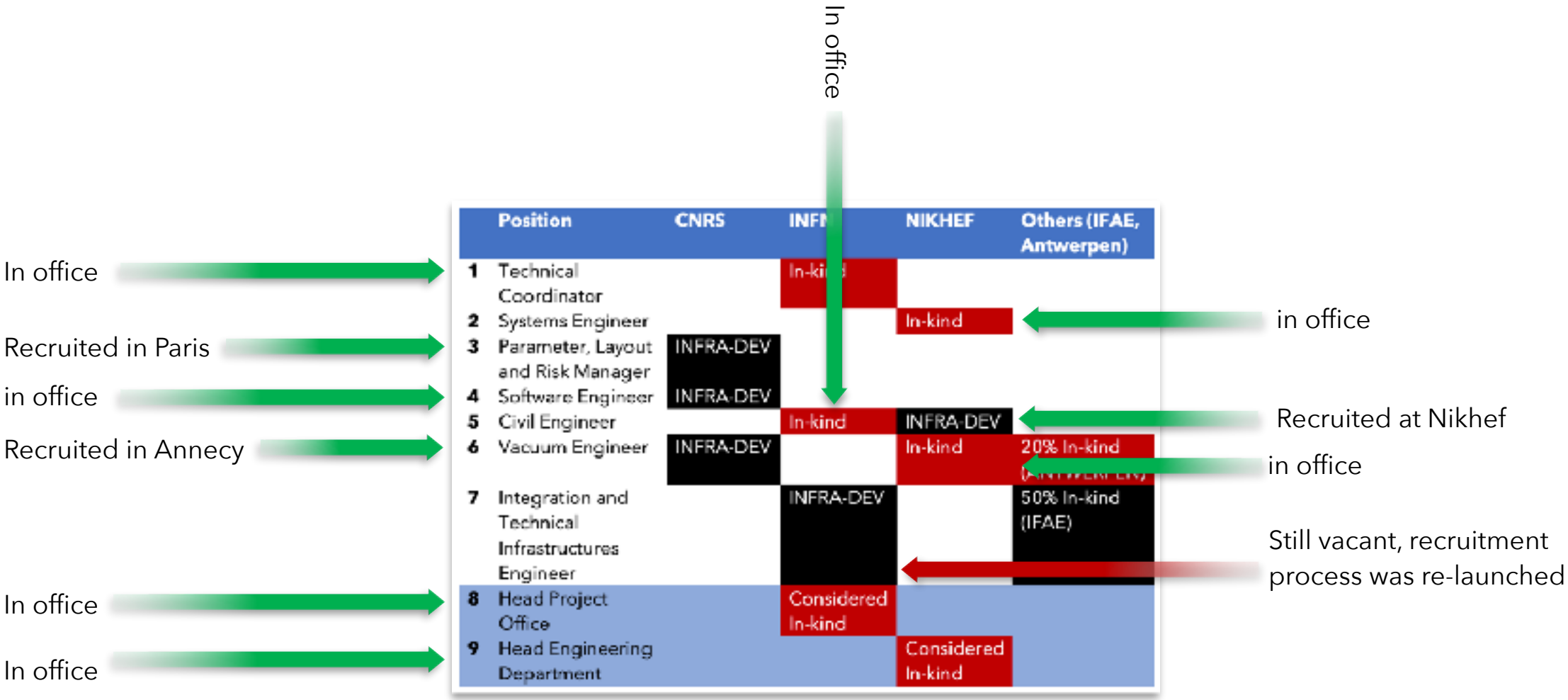
Engineering Department Mandate and Structure

Abstract

This document describes the mandate and structure of the Engineering Department for the Einstein Telescope Organization (ETO).

Author(s) & Affiliation(s)	Verified
Patrick Wareke, ETO/Nikhef	

Personnel



	Position	CNRS	INFN	NIKHEF	Others (IFAE, Antwerpen)
1	Technical Coordinator		In-kind		
2	Systems Engineer			In-kind	
3	Parameter, Layout and Risk Manager	INFRA-DEV			
4	Software Engineer	INFRA-DEV			
5	Civil Engineer		In-kind	INFRA-DEV	
6	Vacuum Engineer	INFRA-DEV		In-kind	20% In-kind (ANTWERPEN)
7	Integration and Technical Infrastructures Engineer		INFRA-DEV		50% In-kind (IFAE)
8	Head Project Office		Considered In-kind		
9	Head Engineering Department			Considered In-kind	

Reported Progress

WP	Task	Objectives for the period	Activities carried out in the period (please include a short description of the activities carried out)	Significant results (e.g. deliverable submission, milestone, achievement, publication, etc)
5	5.1	Establishing functional Project Office (PO) and Engineering Department (ED) units	Regular WP5 management meetings	Regular team meetings of base PO and ED teams
5	5.2	Create documents with the structure and mandate of PO and ED	Regular WP5 management meetings	First version of documents about the structure and the mandate of PO and ED
5	5.3	Documenting the tool requirements for our project management	Meeting of dedicate working group + Meeting with CERN to explore CERN support	Issue of document about Project Office IT Tools Requirements

Reported Risks and Mitigation

Risk Number	Description of Risk	WP	Proposed risk-mitigation measures	Did your risk materialise ? Yes / No	Did you apply risk mitigation measures? Yes / No	Comments (insert comment if needed; mandatory if the risk mitigation measures have not been applied)
1	Delay in completing hiring process for new full-time engineering positions (low, medium).	5	Assign existing part-time personal from partner institutes to assist in the start-up phase.	Yes	Yes	Working more with CERN and requesting additional in-kind support from ET-PP partners. KU Leuven has pledged up to 4 FTE in support.
2	Difficulties to find personnel in the participant institutions for the leadership and the collaborator positions required for the Project Office and the Engineering Department (low, medium).	5	Provide temporary support from the collaboration and invite experts from external institutes.	No		Both the head of the PO and of the ED as well as several key collaborators were appointed thanks to the contribution from the participant institute
3	Delays in producing the RI TDR (i) Medium (ii) High	5,6	Involve external engineering companies in order to speed-up the process.	No		
4	Delays in producing the Detector TDR (i) Medium (ii) Medium.	5,6	Define a staged installation strategy and prioritise design of first stage.			

… where do we go from here ?

1. Complete **the recruitment of the resources funded by INFRA-DEV**.
2. Continue to **develop the activities of the Project Office and the Engineering Department** in the context of ETO, closely working together with the Collaboration.
3. As we progress with the definition of the modus operandi of the Project Office and of the Engineering Department, **we need more human and material resources than provided via ET-PP.** Working with the BGR to establish new ‘ETO funds’ (€3.5M p.a. plus 6.5 FTE p.a.).

...end