Document ID		
Author: A. Rocchi	Verified: A. Variola, L. Latronico	Validated: A. Variola
Document type	Meeting Slides	
Status	DRAFT	

PBS status & Layouts

Alessio Rocchi, INFN Roma Tor Vergata

ET Annual Meeting, Orsay 13-16.11.2023

Current status of the PBS

- First release of the PBS at the Cagliari ET Symposium (May 2023).
- Since then, several interactions occurred:
  1. Review for "single-line breakdowns"

Level	PBS code	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
6	1.1.3.3.2.1						Network and interface for timestamp distribution and t
6	1.1.3.3.2.2						Network and interface for distribution of low phase no
5	1.1.3.3.3					Real-time distribution	
6	1.1.3.3.3.1						Network and interface for real-time data exchange
5	1.1.3.3.4					Real time computing	
6	1.1.3.3.4.1						Processing units and software
5	1.1.3.3.5					Data collection pipeline	
6	1.1.3.3.5.1						Data collection flows
5	1.1.3.3.6					DAQ software	
6	1.1.3.3.6.1						SCADA-like system
6	1.1.3.3.6.2						Automation environment

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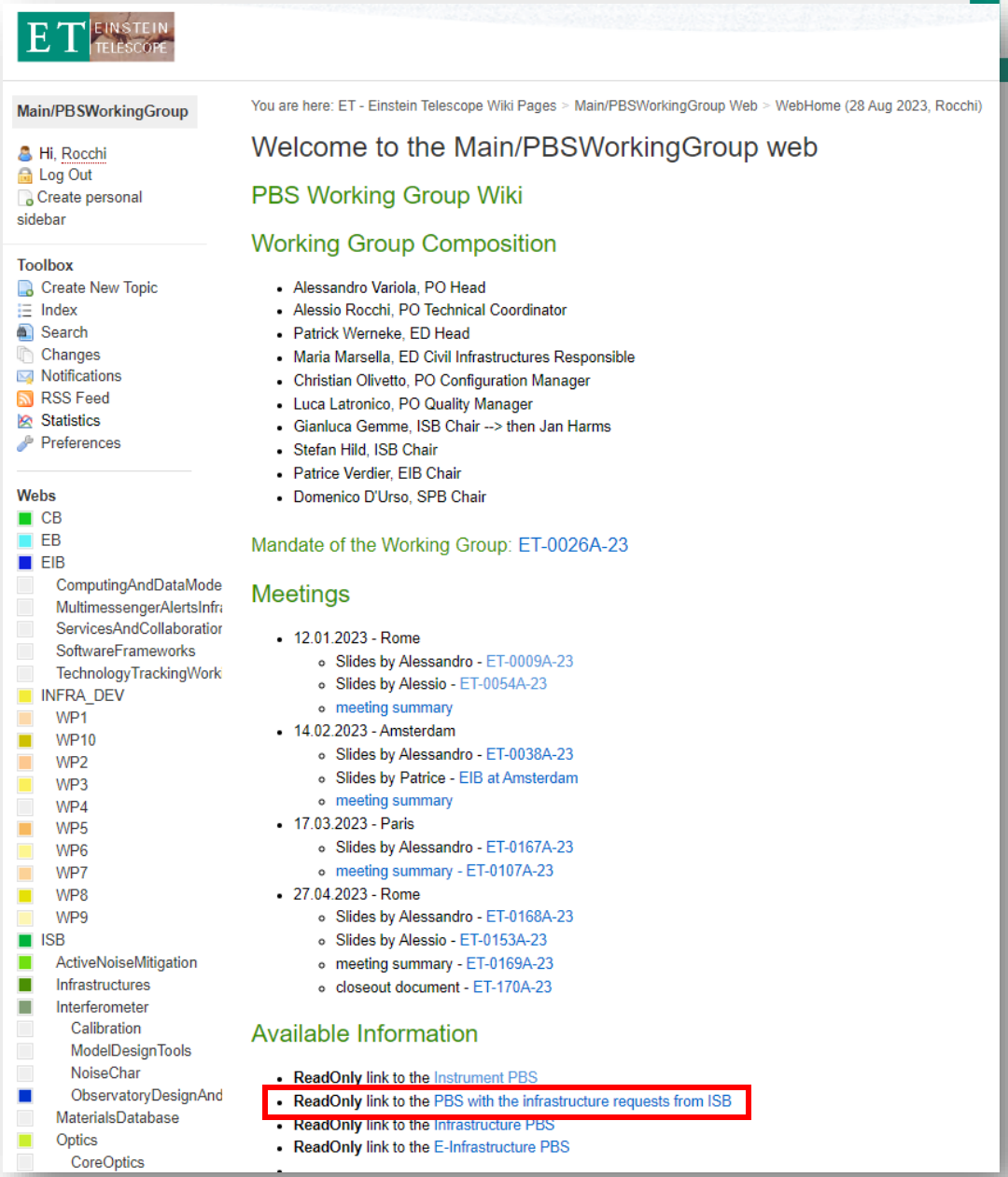

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Welcome to the Main/PBSWorkingGroup web

PBS Working Group Wiki

Working Group Composition

- Alessandro Variola, PO Head
- Alessio Rocchi, PO Technical Coordinator
- Patrick Werneke, ED Head
- Maria Marsella, ED Civil Infrastructures Responsible
- Christian Olivetto, PO Configuration Manager
- Luca Latronico, PO Quality Manager
- Gianluca Gemme, ISB Chair --> then Jan Harms
- Stefan Hild, ISB Chair
- Patrice Verdier, EIB Chair
- Domenico D'Urso, SPB Chair

Mandate of the Working Group: ET-0026A-23

Meetings

- 12.01.2023 - Rome
  - Slides by Alessandro - ET-0009A-23
  - Slides by Alessio - ET-0054A-23
  - meeting summary
- 14.02.2023 - Amsterdam
  - Slides by Alessandro - ET-0038A-23
  - Slides by Patrice - EIB at Amsterdam
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- 17.03.2023 - Paris
  - Slides by Alessandro - ET-0167A-23
  - meeting summary - ET-0107A-23
- 27.04.2023 - Rome
  - Slides by Alessandro - ET-0168A-23
  - Slides by Alessio - ET-0153A-23
  - meeting summary - ET-0169A-23
  - closeout document - ET-170A-23

Available Information

- **ReadOnly** link to the Instrument PBS
- **ReadOnly** link to the PBS with the infrastructure requests from ISB
- **ReadOnly** link to the Infrastructure PBS
- **ReadOnly** link to the E-Infrastructure PBS

Civil Infrastructure

Level	PBS code	Level 3	Level 4	Level 5	Level 6	Level 7
3	1.1.2	Optics				
4	1.1.2.1		Lasers			
4	1.1.2.2		Quantum noise reduction			
4	1.1.2.3		Wavefront sensing and control			
5	1.1.2.3.1			WS&C Room		
6	1.1.2.3.1.1				Storage Room	
6	1.1.2.3.1.2				Clean assembly room	
3	1.1.3	Interferometer				
3	1.1.4	Vacuum&Cryogenics				
4	1.1.4.1		Tower Vacuum			
4	1.1.4.2		Cryogenic Infrastructure			
5	1.1.4.2.1			Helium plant		
6	1.1.4.2.1.1				Coldbox (industrial supplier)	
6	1.1.4.2.1.2				Compressor station (industrial supplier)	
6	1.1.4.2.1.3				Warm helium storage and transfer (industrial supplier)	
5	1.1.4.2.2			Cryogenic transfer lines (CTL)		
6	1.1.4.2.2.1				CTL type ICB-CSU_HF	
7	1.1.4.2.2.1.1					Vacuum envelope
7	1.1.4.2.2.1.2					Thermal shield
7	1.1.4.2.2.1.3					Pipework
7	1.1.4.2.2.1.4					Instrumentation
6	1.1.4.2.2.2				CTL type CSU_HF-CP_HF	
7	1.1.4.2.2.2.1					Vacuum envelope
7	1.1.4.2.2.2.2					Thermal shield
7	1.1.4.2.2.2.3					Pipework
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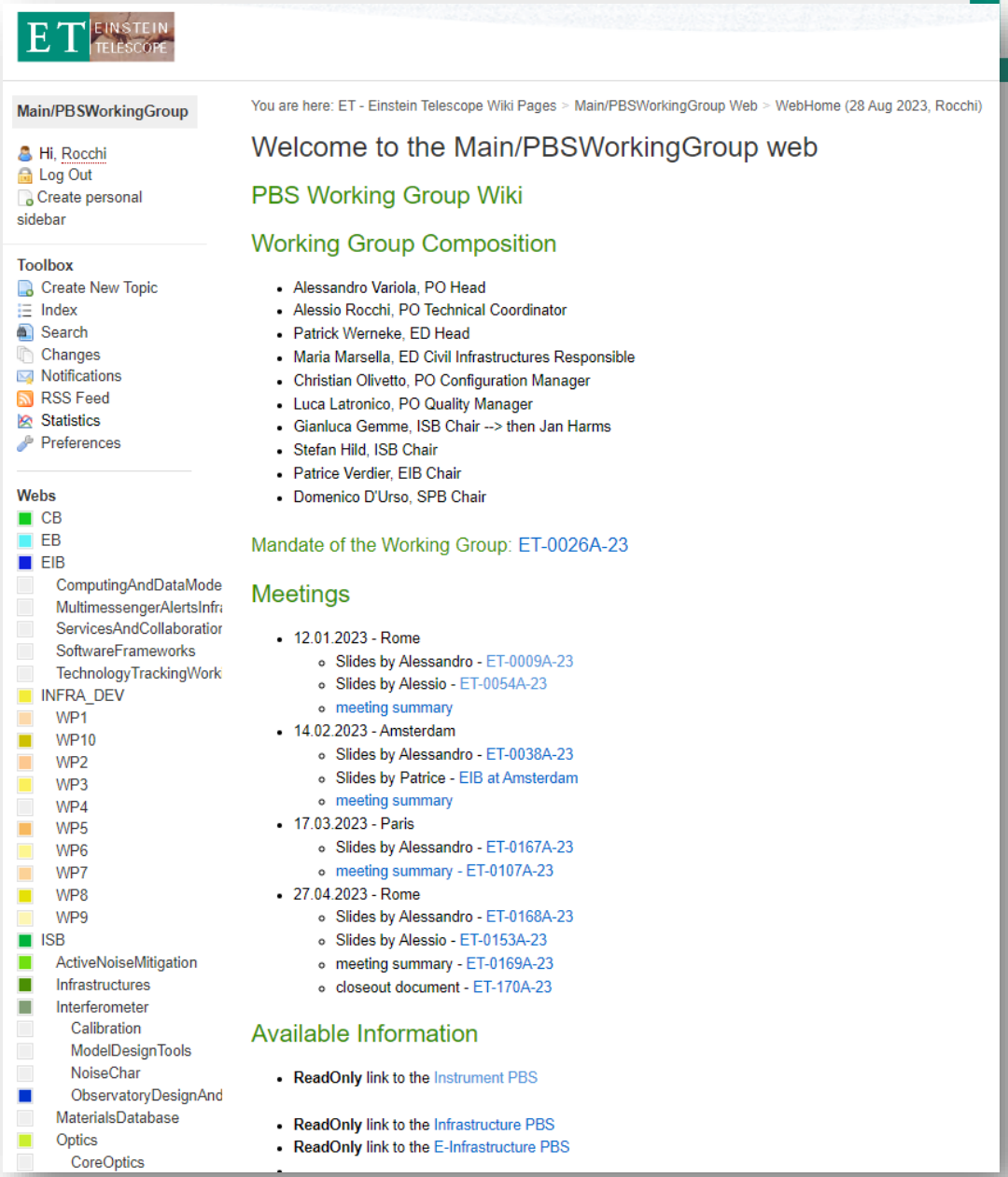
Technical Infrastructure



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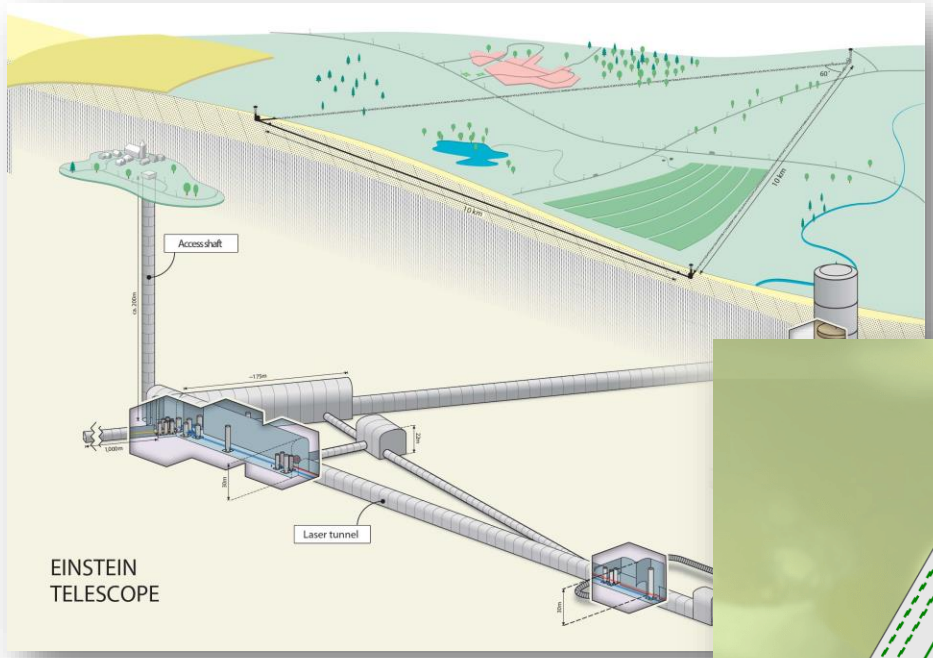
Technical Infrastructure

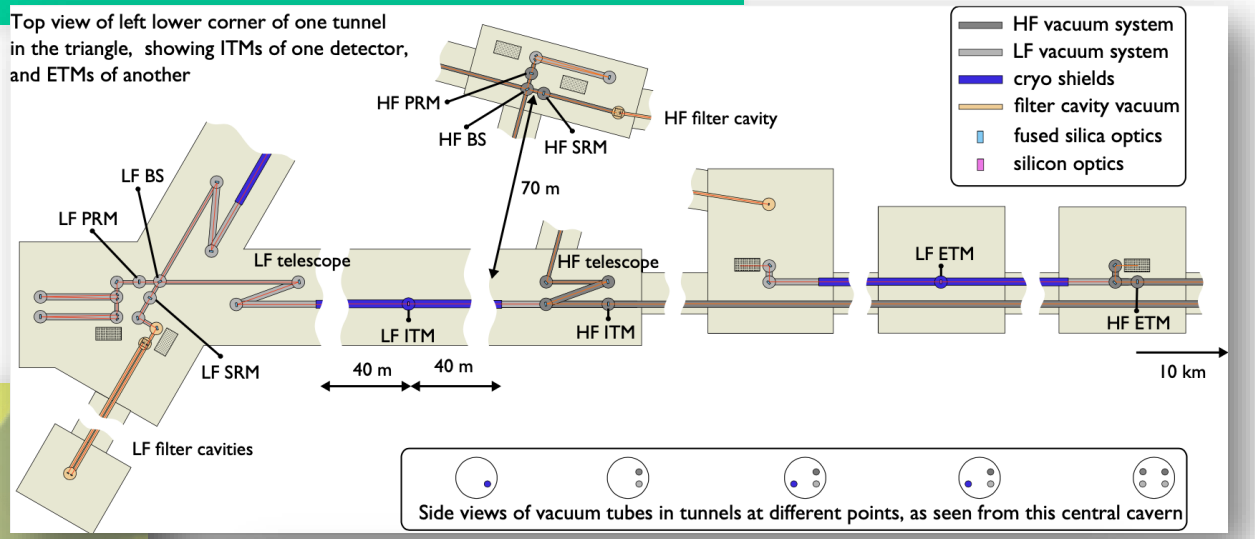
Current status of the PBS

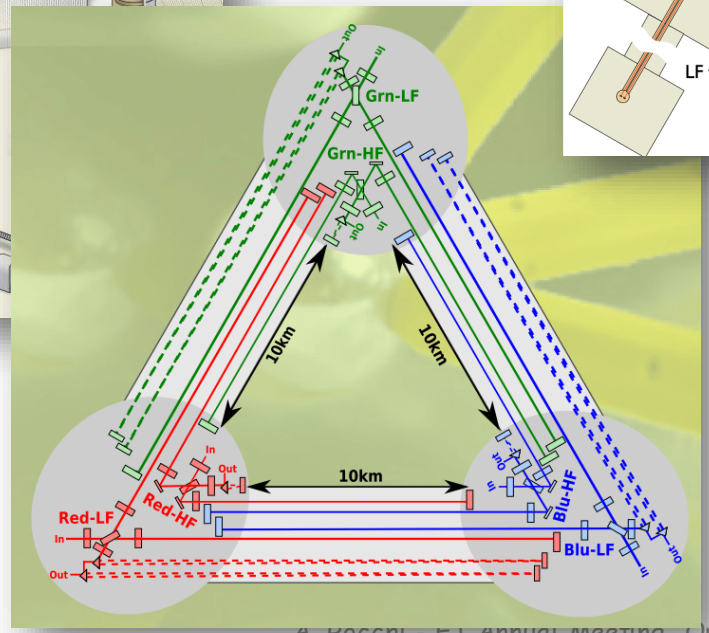
- First release of the PBS at the Cagliari ET Symposium (May 2023).
- Since then, several interactions occurred:
  1. Review for "single-line breakdowns"
  2. Discussion with ED on integration of infrastructure requests from Divisions/WPs
  3. During the process of collecting names for parameters' files, some Divisions/WPs asked for revisions of the PBS
- All these changes did not follow a CR procedure, it will be enforced once the parameters have been collected
- Last-updated and official version can be downloaded from:

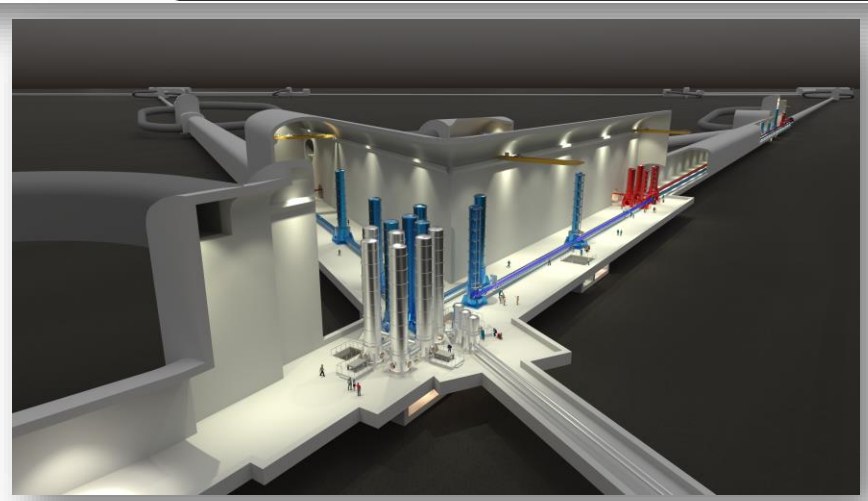
  https://wiki.et-gw.eu/Main/PBSWorkingGroup/WebHome

Layouts









Few results from googling
"Einstein Telescope layout"

Layouts

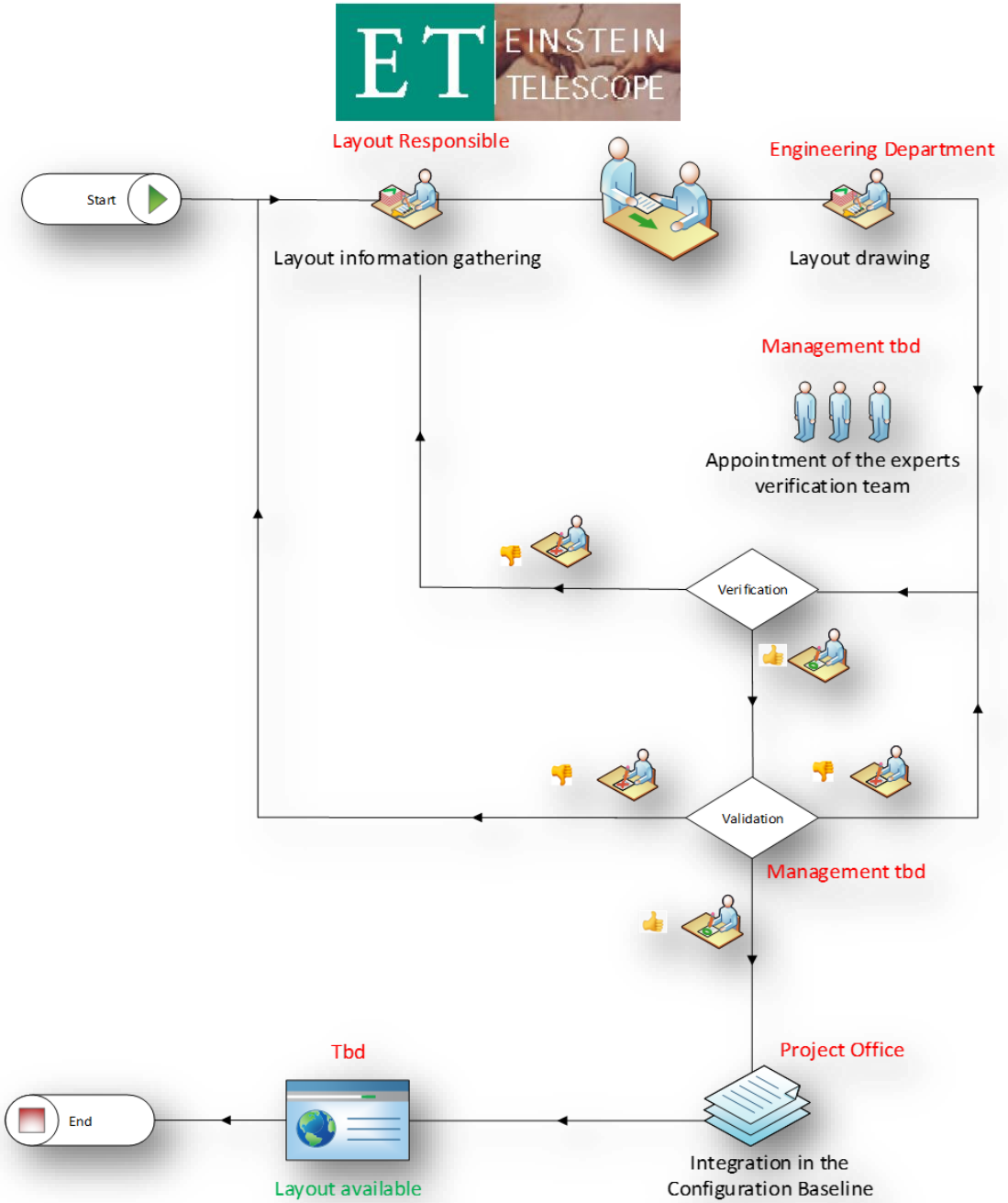
- Layouts do not describe the elements or the systems but their location/position and sequence
- They set absolute positions of the units in their upper systems
- They must be supported by nomenclature
- **Functional** layouts divide the layouts by functional elements (optical, mechanical, electrical, vacuum…)
  - i.e. in the optical layouts, only the optical elements will be illustrated, not the vacuum ones.
- They are extremely important for:
  - civil infrastructures
  - configuration
  - utility matrices
  - identification of interfaces
- Layouts should be designed starting from the upper PBS tiers.

Rules

- Each Layout must provide a univocal description, which characteristic shall be described
- One person in charge must be identified for each Layout
- Verification and validation loops to be defined/integrated
- A list of the Configuration Items Layouts must be provided in agreement with ISB, ED, PO (Technical coordinator, Quality and Configuration Managers). Only necessary layouts are to be considered CI
- A unique format shall be integrated for the layouts
- The nomenclature must identify the object AND its location/position.
- Layouts are not CAD. Elements are represented not by their physical drawings.
- Functional layouts must be integrated with the functional parameter of the element (in the drawing or in a separate spreadsheet).

CI Layouts preliminary list

Acronym	Layout	Status
General layout	Global view of the different systems positioning	
Optical	Conceptual sketch of the main interferometer optical system	Triangle configuration defined in CDR and transferred to PBS
Cryogenics	Conceptual design of the cryogenic production, storage and distribution system	
Vacuum	Conceptual design of the vacuum distribution system	
Power	Electrical power distribution	
DAQ	Layout of the DAQ boxes and connections	
Auxiliary Optics	Layout of the auxiliary laser system for arm cavities locking; layout of Hartmann sensing beams; layout of optical levers for payload control...	
Network	Layout of the network distribution system	
Environmental monitoring	Layout of the distribution of the environmental sensors (temperature, humidity, pressure, magnetic field...)	


Layout Responsible
Engineering Department
Start
Layout information gathering
Layout drawing
Management tbd
Appointment of the experts verification team
Verification
Validation
Management tbd
Tbd
Project Office
End
Layout available
Integration in the Configuration Baseline

Roles

- As far as the Project Office is concerned there are three main actors:
  - C. Olivetto (Configuration manager)
  - L. Latronico (Quality manager)
  - A. Rocchi (Technical coordinator)
  - R. Meijer (System engineer)
- ED: P. Werneke and M. Marsella
- Collaboration: TBD
- A. Variola (oversight)

PBS: Conclusions and next steps

- PBS presented last May and updated following interactions with relevant parties (ED, Division Chairs, WP Coordinators);
- Process for integrating names of "cognizant scientists" for PBS elements from Collaboration in progress --> predecessor to collection of parameters' files (see talk by L. Latronico);
- As soon as parameters collection is over, start **review process** of the PBS:
  - Check consistency of parameters and requirements
  - Check for functional interfaces (physical interfaces from layouts)
  - Check if breakdown is consistent with **both Δ and 2L configurations**

Layouts: Conclusions and next steps

- Functional layouts are essential for several processes in the Project;
- Activity just started and preliminary list presented;
- Need to form a Working Group (or, maybe, more than one):
  - identified members from PO and ED;
  - input needed from ISB:
    - personpower for the WG(s);
    - review preliminary list of layouts;
- Produce layouts for **both Δ and 2L configurations**