

ETO Task force for ET detector layout - 14th weekly meeting

F. Sorrentino

Draft agenda for in-person meeting @ CERN

- First day morning
 - 9:00 arrivals & registration
 - 9:30 informal discussion
 - 10:00 welcome by T. A. Bud
 - 10:10 start of plenary session
- **Registration is over - 19 participants**
 - Less than expected from poll
 - Any more people planning to join?
 - Please let us know ASAP to help local support



Draft agenda for in-person meeting @ CERN

- Draft agenda with chairs:

- 5/5 am

- plenary: update on background information and main tools (F. Sorrentino)
 - definition of work plan and tasks assignment (F. Sorrentino)

- 5/5 pm

- Parallel: optical layout update (A. Green & A. Perreca)
 - Parallel: TRL analysis (G. Mahmoud)
 - Parallel: civil infrastructure criteria & tools (J. Bratanata)

- 6/5 am

- Plenary: update from previous day
 - Parallel: detector layout update (M. Majoor)
 - Parallel: tower integration (R. Meijer)
 - Parallel: noise budget & science case (U. Dupletsa)

- 6/5 pm

- Plenary: update from morning
 - Parallel: optical layout flexibility envelope (A. Green & A. Perreca)
 - Parallel: risk analysis (G. Mahmoud)

- 7/5 am

- Plenary: update from previous day
 - Parallel: optical layout flexibility demand (A. Green & A. Perreca)
 - Parallel: flexibility analysis (G. Mahmoud)
 - Parallel: noise budget & science case (U. Dupletsa)

- 7/5 pm

- Parallel: detector layout flexibility envelope (M. Majoor)
 - Parallel: civil infrastructure criteria & tools (J. Bratanata)
 - Plenary: wrap up & conclusions (F. Sorrentino)

Main document - writing tasks & indicative length

- Introduction, scope and structure of the document (**F. Sorrentino**) **2 pg**
- Basic system decomposition (**R. Meijer**) **2 pg**
- Optical layout (**A. Green & A. Perreca**)
 - common features, definition of flexibility demand **2 pg**
 - baseline 2L layout (i.e. our choice), main features and comparison with 2024 reference 2L layout **4 pg**
 - baseline triangle layout (i.e. our choice), main features and comparison with 2024 reference triangle layout **4 pg**
- Integrated towers (**R. Meijer & F. Spada**)
 - Summary of tower categorization **4÷5 pg**
- Detector layout (**M. Majoor & P. Werneke**)
 - common features, definition of flexibility envelope **4 pg**
 - baseline 2L layout (i.e. our choice), main features and comparison with 2024 reference **4 pg**
 - baseline triangle layout (i.e. our choice), main features and comparison with 2024 reference **4 pg**
- Interface with infrastructure (**J. Bratanata**)
 - Volume requirements **2 pg**
 - Technical requirements **2 pg**
- Risk and flexibility (**G. Mahmoud**)
 - rationale for risk and flexibility analysis **2 pg**
 - analysis on 2L: list of options, comparison of baseline configuration with options and with 2024 reference **4 pg**
 - analysis on triangle: idem **4 pg**
- Performance
 - Noise budget for baseline configuration, comparison with 2024 reference (**M. Korobko & V. Sequino**) **4 pg**
 - Summary of science case for baseline configuration, comparison with reference (**F. Iacovelli & U. Dupletsa**) **4 pg**
- Appendix - list of annexes (**B. Tuybens**) **n.a. (delete? Everything is in the extended document)**



Extended supporting document - writing tasks

- Study logic and workflow (**F. Sorrentino**)
- Detailed system decomposition (**R. Meijer & M. Korobko**)
 - interfaces
 - requirements
- Optical layout (**A. Green & A. Perreca**)
 - detailed explanation of flexibility envelope and flexibility demands
 - description of available options for 2L
 - description of available options for triangle
- Integrated towers
 - Main design options for seismic isolation (**C. Mow-Lowry & F. Spada**)
 - Main design options for cryogenics (**F. Ricci & H. J. Bulten**)
 - Main options for tower access (**J. Gargiulo**)
 - Rationale for tower categorization (**R. Meijer**)
- Vacuum pipes
 - Arm cavity pipes (**P. Werneke**)
 - Other pipes (**J. Gargiulo**)

Extended supporting document - writing tasks

- Detector layout
 - explanation of major space claims
 - scaffoldings (**M. Majoor**)
 - clean rooms (**P. Rapagnani**)
 - technical rooms (**P. Werneke**)
 - cryogenics infrastructure (**S. Grohmann**)
 - other?
 - optional 2L layouts (**M. Majoor**)
 - no periscope for LF_FC
 - double cavern
 - etc.
 - optional triangle layouts (**M. Majoor**)
- Civil engineering (**J. Bratanata & T. A. Bud**)
 - Tools and criteria to determine cost of civil infrastructure vs detector layout changes
- Risk and flexibility (**G. Mahmoud & F. Sorrentino**)
 - Extended explanation of risk and flexibility analysis
 - Identification of options
- Performance
 - Tools for noise budget (**M. Korobko & V. Sequino**)
 - Figures of merit for science case and performance risk quantification (**U. Dupletsa & F. Iacovelli**)
 - Derivation of scientific requirements on main design parameters (**M. Korobko, V. Sequino, U. Dupletsa & F. Iacovelli**)
- Technical annexes (see below)

Technical annexes

- Technical drawings
 - 2D model for optical layouts (baseline & options for 2L and triangle) **(optical team)**
 - 3D models for detector layout (baseline & options for 2L and triangle) **(M. Majoer)**
 - Technical drawings of individual elements? Suspensions, integrated tower, cryostat, etc. **(TBD)**
- Plots
 - Sensitivity curves for reference and optional layouts **(M. Korobko, V. Sequino)**
 - Science case plots for reference and optional layouts **(U. Dupletsa, F. Iacovelli)**
 - Interactive plots for science requirements on design parameters **(U. Dupletsa, F. Iacovelli)**
 - etc
- Additional supporting documents (incorporate in single extended supporting document?)
 - Flexibility envelope/demands for optical layout **(optical team)**
 - System decomposition **(R. Meijer, M. Korobko)**
 - Tower categorisation **(R. Meijer, F. Spada)**
 - etc
- Tables
 - System decomposition **(R. Meijer, M. Korobko)**
 - Tower categorization **(R. Meijer, F. Spada)**
 - TRL **(G. Mahmoud)**
 - Risk register **(G. Mahmoud)**
 - Rigidity matrix **(G. Mahmoud)**
 - Flexibility envelope & demand **(optical team, M. Majoer)**
- **Please include all hyperlinks and attach all needed images - or send them to Benoit**



Background information

- Terms of Reference of External Review Committee (shared);
- ETO Task Force mandate (shared);
- Optical layout 2024 document for triangle (pdf);
- Optical layout 2024 document for 2L (pdf);
- 2D drawing of optical layout 2024 for triangle (pdf);
- 2D drawing of optical layout 2024 for 2L (pdf);
- Detector layout 2024 document for the triangle (pdf);
- Detector layout 2024 document for the 2L (pdf);
- 3D model of 2024 detector layout (trimble connect) for the triangle;
- 3D model of 2024 detector layout (trimble connect) for the 2L;
- Trimble guideline;
- ESFRI proposal: 2020 CDR;
- Tunnel diameter requirements (pdf);
- Reference document for cryogenic system (pdf);
- LF TM suspension document (draft pdf);
- Suspension system classification (pdf) - completely changed in ETO Task Force work, highlight relevant sections;
- Science case: COBA paper (pdf);
- ET noise budget: sensitivity curve update (pdf);
- Reference on Civil Engineering (TBD);
- Guideline how to read the documents.



Timeline for document editing

- Main document
 - detailed t.o.c. by 31/3
 - early draft by 14/4
 - **mature draft by 28/4**
 - internal review @CERN meeting on May 5÷7
 - **draft to ETO coordinators on 9/5**
 - final version delivered to review committee 21/5
- Extended supporting document
 - incorporate material from old document by 31/3
 - detailed t.o.c. by 7/4
 - **early draft by 28/4**
 - **second draft for ETO coordinators on 9/5**
 - mature draft attached to delivery for review committee on 21/5, to be updated following review
- Annexes
 - list of annexes and responsibility assignments by 31/3
 - **drafts by 28/4**, internal review @CERN meeting on May 5÷7
 - mature draft attached to delivery for review committee on 21/5, to be updated following review

Contribution to ET symposium

- Proposed draft agenda for dedicated parallel session - total available time 2 hrs
 - General summary (10 min)
 - System decomposition (20 min)
 - Optical layout updates, flexibility envelope and flexibility demands - 2L & triangle (30 min)
 - Detector layout updates - 2L & triangle (20 min)
 - Integrated towers (20 min)
 - Requirements to civil infrastructure (20 min)

Science case & risk analysis will be covered in other sessions

Next steps

- Next week CERN in-person meeting
- Intermediate deadline on **May 9**:
 - draft documents delivery to ETO directors
 - share draft with ETC and collect feedback on GitLab
- Final delivery to review committee: **May 21**
- Main actions items during next 3 weeks
 - complete mature draft of main document (writing task owners, distribute work if necessary)
 - feedback on main document (all, possibly use gitlab)
 - first draft of extended supporting document (writing task owners, distribute work if necessary)
 - finalise risk/flexibility analysis (Ghada + people in charge)
 - risk register
 - TRL table
 - rigidity matrix
 - input to requirements tables (all groups, see Romano's presentation on 14/4)
 - progress on flexibility envelope (optical layout group + detector layout group)
 - progress on flexibility demand (optical layout group)
 - finalise noise budget and science case analysis
 - Prepare in-person meeting @CERN
 - optical layout update
 - detector layout update
 - finalize tools and criteria for civil engineering
 - finalise noise budget and science case analysis