**Taskforce Weekly Plenary Meeting**   
***Agenda, 3 March 2025***

**Meeting time:** 14:30 – 16:00 CET

**Zoom meeting room:**

[Zoom link](https://cern.zoom.us/j/61274255815?pwd=2fwGbaMrZAYmUfpUfMCjKwpoYzPCKd.1)

Attendees: All task force members

Chair: Fiodor Sorentino

**Key Takeaways:**

* Cleanliness requirements and procedures for towers/payloads discussed, with action to verify clean room sizing in detector layout
* Tower categorization and options identification work ongoing, to be completed before Amsterdam meeting if possible
* Noise budget simulations presented, including "worst case" scenarios without filter cavities
* Proposed agenda for Amsterdam meeting shared, with focus on detector layout and carbon reduction
* New tools introduced: action item tracking spreadsheet, glossary/acronyms in Overleaf doc, civil engineering cost estimation tool

**Next steps/actions:**

* Complete tower options identification if possible before Amsterdam
* Prepare for tunnel diameter reduction discussion at Amsterdam meeting
* Add PISA meeting action items to tracking spreadsheet
* Start using glossary/acronym functionality in Overleaf document
* Expand civil engineering tool to include tunnels
* Refine criteria for civil engineering cost estimates
* **Update on tower categorisation**

***14:30-14:50 CET***

**Point presented by:** Romano Meijer

**Point submitted for:** information

**Summary of discussion:**

Romano provided an update on the work to categorize and map the different tower components and nodes onto the optical layout. This includes incorporating the periscope towers and high frequency test masses. The task force members agreed to continue this work offline, focusing on completing the quantification of residual motion and mapping the vacuum vessel requirements. There was also discussion of the need to consider integrated tower concepts that optimize across the different subsystems.

**Takeaways:**

* Romano updated categorization based on PISA discussions and new optical layout
* Separate category added for high frequency test masses
* Options for different categories still need to be summarized
* Aim to complete options identification before Amsterdam if possible
* May need dedicated session on tower integration in Amsterdam
* **Clean rooms needs from cleanliness requirements**

***14:50-15:10 CET***

**Point presented by:** Piero Rapagnani

**Point submitted for:** information

**Summary of discussion:**

Piero provided an overview of the key challenges with maintaining cleanliness for the optical components, including fiber damage from dust and particles, absorption issues, and stray light. He outlined the typical clean room setup and procedures used, emphasizing the importance of a multi-step cleaning process starting from the initial component preparation through final assembly. The task force members discussed the difficulty of maintaining cleanliness, especially during critical assembly steps, and the need to further investigate the specific particle size distributions that pose the greatest risk.

**Takeaways:**

* Piero Rapagnani presented on cleanliness needs for towers/payloads
* Key risks: fiber damage from particles, point absorbers on mirrors, increased stray light
* Particles >10 μm most dangerous for fibers/mirrors
* Clean room class ISO 5 (old Class 100) recommended minimum
* Detailed cleaning procedures outlined, including ultrasonic baths and washing tunnels
* Action: Verify clean room sizing in detector layout with Piero/Antonio
* **Update on noise budget**

***15:10-15:25 CET***

**Point presented by:** Valeria Sequino

**Point submitted for:** information

**Summary of discussion:**

Valeria summarized the ongoing noise budget analysis, including the sensitivity curves provided to the US team for review. The task force members discussed the need to analyze both nominal and worst-case scenarios, and to ensure the parameter ranges used are reasonable and aligned with the science case requirements. Further work is planned to incorporate the impact of suspension and cryogenic temperature on the noise budget.

**Takeaways:**

* Valeria presented sensitivity curves for various scenarios, including:
  + Different filter cavity lengths
  + Temperature variations
  + Residual gas pressure changes
  + "Worst case" scenarios without filter cavities
* Ongoing work on suspension thermal noise, input mode cleaner length impacts
* Science case analysis of curves to be done by Francesco Ulana
* **Draft agenda for the Amsterdam meeting**

***15:25-15:35 CET***

**Point presented by:** Fiodor Sorrentino

**Point submitted for:** information

**Summary of discussion:**

Fiodor presented a proposed agenda for the upcoming in-person meeting in Amsterdam, suggesting more time for plenary sessions and flexibility in the parallel session topics. The group discussed the need to focus on reducing tunnel volumes as a key cost driver, as well as adding dedicated sessions on tower integration and tunnel diameter optimization. There was also agreement to mark some parallel sessions as optional to allow for flexibility.

**Takeaways:**

* Proposed 3-day agenda shared, with mix of plenary and parallel sessions
* Focus on 2L detector layout, cavern volume reduction, system decomposition
* Suggestions to:
  + Add session on tunnel diameter reduction
  + Mark some parallel sessions as optional/flexible
  + Include tower integration session
* **Software tool for civil engineering**

***15:35-15:50 CET***

**Point presented by:** Wissam Wahbeh and Jonathan Bratanata

**Point submitted for:** information

**Summary of discussion:**

Wissam demonstrated a parametric model being developed to estimate civil engineering costs based on the detector layout. The tool allows for interactive exploration of how changes to the layout impact the calculated volumes and costs. The task force members agreed this would be a valuable tool to use during the Amsterdam meeting.

**Takeaways:**

* Civil engineering cost estimation tool demonstrated:
  + Parametric model of caverns/volumes
  + Can calculate volumes and costs based on layout changes
  + To be expanded to include tunnels before Amsterdam
* **List of action items and glossary for Overleaf document**

***15:50-16:00 CET***

**Point presented by:** Benoît Tuybens

**Point submitted for:** information

**Summary of discussion:**

Benoît provided an overview of the new action item tracking spreadsheet, and the glossary/acronym features added to the Overleaf document (by Nathan Holland). The task force members were encouraged to utilize these tools to maintain visibility and consistency in the work.

**Takeaways:**

* Action item tracking spreadsheet set up
* Glossary and acronyms functionality added to Overleaf document