**Review of ESTIA TG2 Documents:**

**Concept of Operations:**

The document does not contain a detailed scientific case, the high-level requirements and does not indicate the connection between the proposed instrument configuration and the scientific requirements.

*More detail on the scientific areas to be met and their requirements needs to be added to derive the high level requirements, including how the different operational modes satisfy these.*

**Preliminary System Design:**

The PSD also does not contain any high-level scientific requirements to trace back the functional requirements, only the technical requirements for all subsystems. Therefore the link to the science case is not made in any of the documents presented.

*This should be corrected and list of functional requirements similar to the example document from ODIN should be added to the PSD.*

**On Sample environment in all documents:**

At the moment the description of the SE in all these is lacking in sufficient detail. *The non-hard and magnetic science areas should be taken into proper consideration in the instruments ConOps, System Design, Workpackage Specification and in particular in the Preliminary commissioning and staging plans.*

From the STAP report: “ESTIA will be able to measure a large fraction of the scientific case for reflectometry with the exception of measurements involving horizontal surfaces. ESTIA differs from FREIA in that ESTIA is optimized to perform reflectometry from samples of 1cm or less, and includes a polarized beam capability to study magnetic structures. The ability to measure small samples is important for reflectometry of quantum condensed matter because competition between different order parameters (which if exploited may have dramatic technological implications, e.g., enabling neuromorphic computing) nearly always requires interfaces with unit cell perfection, and samples with such perfect interfaces can not be readily grown with lateral dimensions much more than a few mm. In addition, some complex sample environments tend to require smaller samples, e.g., a pressure cell accommodating a 25 mm2 reflectometry sample requires in excess of 40 tons to create 2 GPa. Subject areas include battery cells, electrochemistry, high pressure studies, lubricants, in plane structures by scanning large samples, laser flash induced kinetics, electric fields, fuel cells and microfluidics. The high flux mode will also provide outstanding time resolution for kinetic studies in all of these areas. Furthermore, a strong overlap between the ESTIA and FREIA instruments will fall in soft matter science in studies of proteins, polymers, surfactants, etc, at the solid/liquid interface. A particular strength of ESTIA will be the use of specifically designed miniaturized solid/liquid cells for the study of precious biological samples.”

**Workpackage Specification:**

**Schedule:** The current project plan indicates installation activities starting in 2018.

*More information about the installation activities envisaged in the current planning for 2018 are needed* to mitigate delays in the project due to the delayed access in the bunker and instrument hall area (March and June 2019 respectively). The instrument team should prepare to discuss this at the meeting. Are pre-build activities possible in a workshop in Lund or do they have to be in place on the beamline?

*There is no WP for sample environment – this needs to be included.*

On Risks: Skip the coffee joke and *include risks related to the proper staffing of the instrument to include a soft matter expert, as well as the risks related to the now reduced scope of the DMSC.*

**Initial Operations and Staging Plan:**

1) The document is very superficial and does not describe the measurements and calibrations necessary to characterized the beam properties, and the procedures for adjusting the instrument alignment or other parameters if the beam properties do not match the expectations. No timeline is indicated for the hot commissioning. The installation, integration and commissioning of different sample environments are described at all. Therefore it is very difficult to judge whether the planning for hot commissioning is realistic.

*A brief commissioning plan for validation/calibration/correction of beam properties, as well as all operational modes including sample environments should be included.*

2) Prioritisation of Scope and Staging options: *It is not clear what priority order is given to future upgrades that are not within the construction scope – this should be described with possible scenarios/sources for the required funding.* In particular, the impact of delaying the high-resolution option and the development project + risks associated with the Space-Time Collimator should be discussed in terms of project planning/financing. Currently, the initial instrument will only have medium resolution and will not be applicable to thick films.