Charge to the TAC for its 14th meeting on October 5-7, 2016

1. Introduction

The rate of progress of the ESS project has continued to increase during the past 6 months since the last TAC meeting and the project is now close to 25% complete. Construction on site has continued to advance at the foreseen high pace as well as the sub-projects both on site and at the in-kind partners.

The unavoidable difficulties that we encounter are being handled with the main goal of preserving the top-level milestones. Feedback and recommendations of the Committee to the applied solutions are eagerly expected.

The “Installation permit” (for devices generating ionizing radiation) has been submitted to the radiation safety authority (SSM) at the foreseen date, early last May. Interaction is actively taking place with SSM with the goal of getting approval in Fall 2017.

Numerous Technical Annexes and In-Kind Agreements have matured and been signed.

The ESS organization and management has continued to evolve. In chronologic order:

- John Haines has been nominated as ESS Programme Manager since August 15, keeping his former responsibility for the integrated schedule and enlarging his role to oversee the whole ESS construction project,
- Ralf Trant is the new Associate Director for Health, Safety, Environment and Quality since October 1,
- John Womersley will become Director General on November 1, 2016.

The installation phase, which is beginning this fall, will become a major activity during the first half of 2017. A specific organization is being set-up for that purpose.

The 14th meeting of the TAC is an opportunity to describe how we are addressing issues and how we plan for the future. In such a period combining extensive/intensive planning

together with execution work, the Committee's observations and recommendations will be especially precious.

2. Charge questions

Our first interrogation is about the follow-up of former TAC recommendations:

Have the recommendations and concerns expressed by TAC been properly addressed?

More specifically during this meeting, we would like the Committee to address the following questions:

- concerning the **Accelerator**:

a1) *The Accelerator session focuses on the RF systems of the accelerator, following the request of the Committee at the last meeting. Does the TAC have recommendations on the systems presented:*

- → *regarding the design and early prototyping?*
- → *regarding the proposed procurements and system assembly which partly is done at IK partners?*
- → *about the plans for integration in the RF gallery and installation?*
- → *about the proposed testing?*

a2) The schedule for the RF systems is challenging and delays are showing up. Success largely depends on the capability of industry to deliver within the foreseen schedule. We would like the TAC to communicate experience on that matter: how likely is it that companies will deliver on time and what can be done to improve the situation? The same question is asked for the installation and RF gallery integration schedule. Any comments or experience to share?

a3) Does the TAC have comments on the organization for installation? Shared experience from other facilities is welcome as part of the answer to this question.

a4) Integration is an on-going effort. Some aspects of accelerator integration with MPS, TSS and PSS are presented and also some aspects of documentation. TAC comments and reactions are expected.

- concerning the **Target**:

t1) Are the proposed concepts and preliminary plan for the in-monolith diagnostics and instrumentation appropriate and sufficient to satisfy the needs of monitoring the target wheel?

t2) Are the interfaces with Accelerator Systems and Neutron Science Systems reasonable and manageable, with respect to the presented design solutions and choices for the monolith vacuum operation and the neutron beam extraction system?

t3) Are the performed assessments and validations of the integrity and robustness of the spallation material thorough enough to constitute a solid basis for a safe commissioning and operation of the target?

t4) Comments and suggestions are expected regarding the design solutions for the cold moderator liquid hydrogen system.

t5) Is the presented filter solution for the target helium cooling system sufficient, robust and appropriate for a safe and reliable operation and maintenance?

t6) Does the proposed organization for installation of the target station seem appropriate for an efficient coordination of all installation activities performed by in-kind partners and contractors, concurrent with on-going building construction and parallel works of the Accelerator, Integrated Control and Neutron Science Systems?

*- concerning the **Integrated Control System (ICS):***

c1) Are the interfaces between the ICS and Accelerator Systems defined and documented well enough for this stage of the project?

c2) Are the progress and the future outlook of the systems presented appropriate and what are potential bottlenecks?

c3) Are the different software tools and infrastructure developed well enough for this stage of the project? Are the processes around these tools properly defined?

c4) Are there any issues/risks with the scalability and performance of the software products when ramped up to operations level?

c5) Do the ICS standardization efforts regarding ICS hardware, ICS software, EPICS, Machine Protection and Personnel Safety Systems correctly and realistically address the requirements needed to implement the ESS mission and schedule?

The Committee is encouraged to provide also suggestions/comments and recommendations on any other subject it would find relevant.

A preliminary version of the TAC report is expected at the end of the meeting, in the afternoon of Friday 7, October. The final report is expected before the end of October. The Chairman will orally present the TAC#14 report to the ESS Council on December 5-6 in Bilbao.