EUROPEAN SPALLATION SOURCE

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Charge to the TAC for its 15th meeting on April 5-7, 2017

1. Introduction

The ESS construction project has significantly progressed since the last meeting of TAC in October 2016, with a degree of completion exceeding now 30%.

Plans for steady-state operations are now established and accepted by the ESS Council, following an external review at the end of October. Plans for Initial Operations which is due to begin in 2019 are now being prepared for review in May 2017.

A Value Engineering exercise has taken place to identify means for restoring contingency to a level that can ensure completion of construction within the prescribed total budget of 1843 M€$_{2013}$.

Significant efforts have been invested in providing additional information to the Swedish Nuclear Safety Authority for the licensing permit submitted early May 2016.

The ESS integrated schedule has been refined and optimized including the plans for the first instruments. It takes into account the delayed start of construction of the target building. Delays in the delivery of the kind contributions due to numerous administrative and legal issues at the partners will be included once they will be quantified, during Q2-2017.

The organization required for the installation and commissioning phase has been defined and it is being implemented. Progress on site has followed schedule and the access has been granted as necessary for the first steps of installation of Target, Accelerator and ICS.

The Committee's observations and recommendations will be very valuable for guiding the ESS management during this intense and complex period for the project.

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) Are there any significant technical issues seen in the STS work?

a2) Is there any orphaned scope identified?

a3) Are the interface between the STS work and other work packages properly defined and addressed?

a4) Are there any issues seen in the STS work as it transitions from project construction to operations?

a5) Comment upon the risks and options for improving the proposed solution for an initially reduced beam power of 3 MW.

a6) Do you see any significant increase in total project cost, up through and including the installation of deferred components, and, in that case, can you suggest mitigations?

a7) Do you consider the presented solution for the RFQ cooling circuit adequate, and does it remove the concerns formulated at the TAC meeting one year ago?

- concerning the **Target**:

t1) Is the presented design of the tuning beam dump sufficiently robust and versatile?

t2) Comment on the decision not to pursue a windowless solution with differential vacuum pumping between the monolith and the accelerator, at this point in time.

t3) Is the process for identifying and allocating safety functions sufficiently comprehensive and balanced in order to assure a reliable and safe operation of the target station?

t4) Is the presented approach for definition of the "ready for beam" signal sound and well balanced? Are all relevant process parameters selected with appropriate thresholds?

t5) Many of the target station systems are about to transition from final design to manufacturing, as exemplified by presentations of the target wheel drive unit and the cryogenic moderator system. The committee is asked to give specific as well as general recommendations with respect to this new phase of the project.

t6) Comment on the chosen technical solutions for the neutron beam extraction system and the instrument bunker.

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

c1) Are technical choices for the MTCA platform appropriate and sufficient?

c2) Have the major technical obstacles for deploying the digital platform been identified and addressed?

c3) Are the features of EPICS 7 addressing the needs of the facility and are they ready for deployment and operation at ESS/ICS?

c4) Will the planned development, testing, and approval procedures allow for sufficiently high quality to ensure reliable operation?

c5) Have all the major installation activities for commissioning and operation been identified and their needs addressed?

c6) Is the relative priority and ordering of tasks appropriate and reasonable considering the commissioning/operation plans?

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, April. The final report is expected before the end of April. The Chairman will orally present the TAC#15 report to the ESS Council on June 1-2 in Warsaw.