7/03/2016

**Charge to the TAC for its 13th meeting**

**on April 6-8, 2016**

1. **Introduction**

Since the last TAC meeting which took place on October 14-16 the ESS project has progressed and it is now close to 20% complete:

* Construction on site is well advanced.
* Additional work packages have been allocated as in-kind and technical work is actively progressing at the partners’ premises as well as in Lund, as TAC will learn during its 13th meeting.

Changes have taken place in the ESS management:

* Agneta Nestenborg has succeeded to Matti Tiirakari as Director for Administration,
* Andreas Schreyer has succeeded to Dimitri Argyriou as Science Director,
* John Haines has been made responsible of the Integrated ESS schedule and took over, by interim, the position of Associate Director for ES&H and Quality after the departure of Patrik Carlsson.
* Eric Pitcher succeeded to John as Leader of the Target Project.

Beyond ensuring technical progress according the schedule, the following objectives are high priority in 2016:

* Signature of more in-kind agreements and negotiation of additional in-kind contributions.
* Submission of the “Installation Permit” in May 2016 (2nd step of licensing).

The 13th meeting of the TAC is an opportunity to put our progress in perspective. I have no doubt that the discussion with TAC and the advices and recommendations of the Committee will again be very precious.

1. **Charge questions**

Our first question to the Committee is:

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

More specifically, we would like the ESS Technical Advisory Committee to address the following questions:

- concerning the **Accelerator**:

* *a1) The AD staff plan (In short, AD is responsible for ion source, accelerator, RF systems, local cooling circuits, Cryogenics for all of ESS and vacuum for all of ESS):*
* *The “green field” nature of ESS means that all AD staff is newly recruited starting from 2010. The pace of recruitment has been set by several parameters such as internal AD project needs, available candidates, budget availability at ESS, ESS HR capability to support recruitment etc. Does the TAC have general recommendations on this process and the priorities set?*
* *There are limited possibilities for short term contracts in Swedish labor law. To avoid “hire and fire” AD is using contracted staff and IK staff contributions. Does the TAC have recommendations on this?*
* *The ambition is to have recruited staff for both the project and operation phase (excluding operators) by 2018, does the TAC have recommendations regarding the competences and numbers of different staff categories in the present staff plan.*
* *a2) The TAC proposed at the last meeting to review the linac accelerating structures. Does the TAC have recommendations on the systems presented:*
* *Regarding the design and early prototyping?*
* *Regarding the proposed procurements and assembly, which mostly is done at IK partners?*
* *For the proposed testing?*
* *a3) The risk of not reaching the specified gradients in a fraction of the superconducting cavities is non negligible. Does TAC have recommendations on:*
	+ *What failure rate we should expect, i.e. what fraction of the cavities will not reach full gradient during tests, allowing additional HPR if needed but not rework (incl. BCP) at the factory?*
	+ *Whether eddy-current scanning of the niobium sheets should be performed, taking into account cost, schedule and the possibility to mitigate by ordering spare cavities?*
	+ *What number of spare cavities should be ordered?*
	+ *Does the TAC have specific recommendations regarding the 84 high-beta cavities for which the TAC had a more extensive presentation?*
* *a4) The plan is to at next TAC return to RF systems and services as well as integration and installation issues. We would be happy to have your comments on that, in particular on what we should focus on.*

- concerning the **Target**:

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| * *t1) Are the hazard analyses and accident analyses being evaluated using a sound approach and are reasonable and appropriate safety-classified mitigation measures being properly identified?*
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| * *t2) Is the design approach for the Primary Water Systems sensible and likely to meet system requirements, and does it represent a reasonable balance between performance, manufacturability, operability, maintainability, cost, and schedule?*
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| * *t3) Is the approach to developing a plan to integrate the civil construction of the Target Station Building with the installation of Target Station systems sound? Do you see opportunities for compressing the schedule further?*
* *t4) Does the concept of maintaining an evacuated atmosphere in the monolith vessel during operation seem sound, and is the proposed design approach reasonable? Is it reasonable to preserve the design option of operating with 1 bar of helium?*
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- concerning the **Integrated Control System**:

* *c1) Is the software scope correctly timed/prioritized for the ICS/ESS context?*
* *c2) Have the risks of the hardware choices been properly estimated? Have any viable alternatives been left out?*
* *c3) Are the management strategies and plans for Accelerator integration appropriate? Are there major issues that need to be addressed/prioritized in order to ramp up with the integration work?*
* *c4) Is the planning method appropriate? Is the connection to the ESS schedule strong enough?*
* *c5) Are the design choice conclusions for infrastructure appropriate? Is the action plan for the MCR appropriate?*

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

A preliminary version of the Committee report is expected at the end of the meeting, in the afternoon of Friday 8, April. The final report is expected two weeks later. The TAC Chair will be asked to present it to the ESS Council on June 9-10.