SAC-22 – 09/10. May 2019

Location: ESS, Lund, Sweden

SAC members present:

Monika Budayova-Spano, Juan Colmenero De Leon, Sabrina Disch, Bela Farago, Thomas Hellweg, Steve Hull, Sine Larsen (Vice-Chair), Martin Månsson, Kell Mortensen, Marie Plazanet, Michael Preuss (Chair), Bill Stirling, Fred E. Wietfeldt, Regine Willumeit-Römer.

Apologies:

Richard Dronskowski, Giovanna Fragneto, Bella Lake.

General comments

First, the SAC would first like to thank the Science Directorate for the excellent organization of the SAC-22 meeting. The SAC appreciates that the Science Directorate was able to schedule all STAP meetings before our SAC meeting enabling the STAP chairs to update us in a timely manner.

The SAC congratulates the ESS on the tremendous progress within the last 6 months having reached 58% of completed construction. We particularly noted that testing of the first part of the proton accelerator has started and further components have started to arrive. Equally, the STAPs generally reported very good progress while also pointing out concerns in some areas, which is expected at this stage of the project.

Update on Neutron Scattering System (NSS)

We were delighted to receive an update on the development of common shielding and slow choppers, which is an ESS driven development from which a number of instruments will benefit. We agree with the Science Directorate that the predicted savings should be reserved by the instrument development groups as contingency in order to mitigate cost pressure.

The SAC remains very concerned about the lack of signed Technical Annexes (TAs), which also includes two of the first three instruments (DREAM and ODIN), as this now starts threatening the scheduled progress on instrument development. We welcome the initiative by the Science Directorate to have scheduled an extraordinary In-Kind Review Committee (IKRC) meeting in June to address this issue.

During the SAC meeting it appeared that the greatest potential threat to the agreed schedule is likely to be the current manufacturing issues of the port blocks near the target. The SAC was presented with different scenarios with the shortest possible delay of the current schedule of 2 months. However, is it not clear if the manufacturing problems experienced by a French steel maker have been overcome and therefore much longer delays have to be considered. This highlights the existing pressure on the agreed schedule and the SAC would like to stress again that any further delays (for whatever reason) will result in a shift of the dates for Beam on Target (BOT), First Science and Start of User Operation (SOUP). The re-baselining has already resulted in very limited time for commissioning instruments and there is great danger that the machine and the instruments are not sufficiently tested before users arrive, which could cause potential reputational damage during the early operation due to unreliable performance.

First Science

The SAC notes that the suggested new milestone for Early Science, now called First Science, proposed during the SAC-21 meeting has been accepted by all sides. Hence we continue to support the proposed focus of First Science on scientific benchmarking. We also continue to support the aim of having a SANS (LOKI), high resolution powder diffractometer (DREAM) and imaging instrument (ODIN) as the first three instruments for SOUP. We note that the scheduling of 8 instruments for hot commissioning might enable the other 5 first phase instruments to contribute to First Science. As mentioned above, the timeline for First Science seems very tight and assumes no further delays, which is already challenged by the port block issues. The SAC notes that even without those issues the predicted chances of achieving First Science before December 2023 are only 80% according to Monte-Carlo simulations. Hence, expectation management and a realistic approach will be of utmost importance in the next few years and the SAC looks forward to working together with the Project Advisory Board and STAPs.

Cost reduction and ringfence

The SAC is aware that the ESS is undergoing again a cost saving exercise in order to stay within the agreed budget. We would like to emphasize that spending within a given budget is something NSS has been doing as part of the ringfence agreement. However, NSS is on a comparatively slow spending profile. The SAC would like to stress that the future spending plan should not jeopardize the ringfence.

Initial operation

The SAC considered the proposed budget for the initial operation and concluded that the increased budget of €891M for 2019-2025 appears to be the minimum necessary budget based on experience at other facilities.

Scientific Evaluation and Access Policy

The SAC had some discussion regarding the first draft of the scientific evaluation and access policy document. We feel that this document is an excellent start and we only had a few minor comments regarding some of the wording (for instance peer review should be carried out by *external experts* and not *scientists* and *engineers*; SAC should not choose peer review panel members but comment on suggested members). One important aspect we would like to highlight though is that the document should include a statement on gender balance and diversity and the acknowledgement section might need to be more specific.

Sample environment for high pressure and magnetic fields

The SAC enjoyed the detailed presentations on sample environment and magnetic fields and encourages to continue scheduling such focused discussion in future SAC meetings. The presentations provided evidence that the high-pressure equipment lead has an excellent understanding of the community. The SAC also welcomes the planned acquisition of magnets currently owned by HZB at a greatly reduced cost. Overall, the SAC was impressed with the sample environment presentations.

DMSC

The SAC received another excellent update from DMSC and supports their current focus on essential developments to deliver First Science rather than spreading out into Artificial Intelligence and Deep Learning as suggested by one of the STAPs. These developments are highly interesting but would require different DMSC staff levels and should be considered as an

aspiration for the future. The SAC learned of communication issues related to the Beam Line Control Team (BCT) and urges ESS to get this sorted out.

Presentation of STAP reports by their chairs

The SAC continues to value the input of the STAP chairs as they provide important independent insight in the development of the instruments, computing facilities and other essential infrastructures the users will require for successful experiments. In some cases, STAP presentations are too granular or concerned with details that might not be of particular use for the SAC. We therefore urge the STAP chairs to only report the most important observations and findings of their STAP meetings in a couple of slides.

The SAC believes that there would be great benefit from creating more interaction between STAPs, which we propose to enable through holding a meeting once a year for all STAPs at the beginning of the week in which the SAC meeting takes place, with the STAP chairs expected to attend the SAC meeting as observers and report. In principle, this procedure follows the approach at the ILL where the sub-committees meet first to decide on beam time and their chairs then attend the scientific council meeting, which takes place in the same week.

Regarding the individual STAP reports, concerns about detector developments were raised a few times but particularly by the Spectroscopy STAP in relation to the multigrid detectors. Since important detector tests are planned to be carried out over the summer on the V20 instrument at HZB the SAC is interested to hear about the findings and suggests a focused session on detectors at the SAC-23 meeting. The SAC also looks forward to hearing a more detailed report on polarisation developments, which was postponed from this meeting to the next one.

The SAC also noted the recommendation by the Sample Environment STAP to develop more technical in-house expertise. The STAP for the DMSC stated that DMSC has found the right balance between developing software for data reduction and data analysis. The Engineering and Imaging STAP highlighted an issue related software development for ODIN carried out by PSI where funding has expired, and further development of the software has stopped. The NMX, SANS and Diffraction STAPs all reported excellent progress. Regarding the SANS instruments, the SAC discussed the need for the first SANS instrument to serve both the soft and hard matter communities.