

15<sup>th</sup> SAC meeting May 9<sup>th</sup>-10<sup>th</sup>  
DMSC, Copenhagen, Denmark

Members present:

Andreas Meyer (Chair) & Sylvia McLain (Co-Chair)

Fabio Bruni, Catherine Pappas, Arnaud Desmedt, Bernhard Frick, Roger Pynn, Toby Perring, Björgvin Hjörvarsson, Markus Braden, Carmen Mijangos, Wojtek Zajac, Kristina Niss, Bo Iversen, Tomas Lundqvist, Klaus Kirch, Jörg F. Löffler

Members absent:

Regine von Klitzing, Helena Van Swygenhoven-Moens

The following contains the SAC report from the meeting conveyed on May 9-10<sup>th</sup> 2016 in Copenhagen. All items *in italics* are quoted from the ESS charge to the SAC for this particular meeting.

The SAC was invited *to consider the sequence in which the instruments and science support functions are finalized, the initial scope will determine our (ESS) ability to deliver early scientific success.*

First and foremost, it is the recommendation of the SAC that the ESS work closely with the SAC to explicitly define what would be considered 'early scientific success' and how this can be measured on the basis of the outcome of the process in place for November 2016 (delineated below). It will be an important task of SAC and ESS to ensure that this early success strategy also includes a clear upgrade path to safeguard the continuing success of the ESS well into the future. Once this has been described, the ESS should present this to the SAC who represent the international user community to ensure that these criteria are scientifically valid.

The ESS stated: *The way we (ESS) adjust instrument scope will also affect upgradability and our ability to fill our full scope commitment in due time, and asked the SAC to advise on the process of adjusting the scope of the instruments, and also on the process of adjusting the scope of data support, sample environment and labs and instrument technologies.*

With respect to the overall plan to adjust the scope of instruments, the strategy of the ESS to convene scope-setting meetings for each instrument which will include advice from the respective STAP panels for each instrument seems sound. In November, once these scope-setting meetings have occurred, the SAC will be presented with the specific criteria by which individual instruments have been chosen from the 16 instruments already approved by the SAC. The process of adjusting scope will be a complex one, with judgements needed both about individual instruments and about the aggregate of all instruments to be built in the first round. The SAC looks forward to being fully engaged in providing advice on these issues based on the needs of the scientific community.

The SAC requests that the November presentations include specific information on how the instruments have been chosen, on how the instruments will be aligned in the guide hall and the upgrade plans for reaching full capability of each instrument. Further, each instrument report should contain information about how the instrument teams plan to integrate sample environment, polarization analysis, data analysis software and engagement with the user community. This is necessary to ensure the performance of world class science from day one of the ESS becoming operational. The SAC further requests that it be presented with information about the ESS plans to integrate all instrumentation. This presentation needs to include information concerning the choices made for the final floor plan – with respect to the location of the first choppers, etc.- and how this plan will be implemented for the currently approved instruments and those to be built in the future.

At the moment, there is serious concern about the ability of the so-called “bunker” to provide low radiation backgrounds, an issue that a recent review described as “beyond urgent”. The SAC requests an update on this and plans to address this issue in November.

At the time of the SAC meeting, the choice of which instruments were marked for initial construction by the ESS were unclear, given that the scope-setting meeting had not yet taken place. This is due to be clarified in November 2016, however the SAC explicitly requests that the ESS provide information on the progress of VOR, which from the documentation presented to the SAC was not always included in the initial approved instrumentation, as well as progress for a potential spin-echo instrument (within one year) , which has not yet been approved by the SAC as a potential 17<sup>th</sup> instrument – as the SAC believes this would be an important addition to the ESS.

The ESS has also asked the SAC to advise the ESS *on the way forward* with respect to the following: *The pre-operations and operations phases will see instruments being commissioned and moving into operation as a part of the launch of the ESS user program. At the same time, a continued capital investment in the NSS project will be necessary in order to complete the implementation of the full scientific scope of the first instruments, to ramp up the scientific support capabilities and to deliver the remaining instruments in the suite of 22.*

During the presentations by the ESS, the SAC was informed of a potential decrease in the number of neutron scattering instruments that could be built within the ESS construction budget and this is a cause for serious concern. However, the overall ESS strategy to identify the sequencing of instruments in light of budget and capabilities of the in-kind partners appears to be sound and the SAC expects that a well-balanced scenario between the sequencing and budget constraints to realize a final suite of 22 world-class instruments will be presented to the SAC in November 2016, which can be subsequently discussed.

In addition, the STAP chairs for both the data management and science center (DMSC) and sample environment (SE) presented updates to the SAC and the SAC was *invited to comment* on these reports.

While these reports were provided by the STAP chairs rather than the ESS management, for both reports the information given was brief and in the main not informative as to how the DMSC and SE will integrate their activities into the overall construction of the ESS. The ESS will present significant and novel challenges for both SE and DMSC – such as high data flow, high-throughput instrumentation, fast temperature changes and the like – yet the evidence from both the current STAP reports as well as from previous SAC meetings of how to identify and surmount these problems still remains unclear with respect to both of these divisions.

With respect to SE, while it was evident that the STAP had begun to identify some prioritization of sample environment needed for the ESS, it is the view of the SAC that clear goals still need to be identified and that this needs be driven by the ESS and then advised upon by the STAP. Worryingly, the concerns from the previous SAC meeting have, for the most part, still not been addressed. As stated in our last report (SAC-14), **the SAC also has some concerns about the SE strategy at this stage; specifically, with respect to how the work flow is organized and how aspects of research and design will be implemented in the SE program.** It is still unclear how interfaces between instrument design and sample environment and the user community will work on a practical level and the evidence of a coherent plan for the development and integration of SE into the facility was not presented to the current SAC. In the same vein, while the DMSC has also made progress towards integration of software and analysis capabilities to ensure the early success of the ESS, the SAC has not been presented with evidence on how these plans would be implemented. For

instance, it remains unclear as to how the DMSC will integrate with each instrument – for example how interfacing between the instruments and the data storage will be accomplished and the identification of which software is needed for the specific instrumentation to be constructed at the ESS.

To this end, the SAC requests that SE and DMSC work with their relevant STAPs to develop clear mission statements and clear paths to success – each with its own milestones – on how the SE and DMSC teams will work with individual instruments as well as the existing user community, in order to achieve their goals. It is the recommendation of the SAC that both SE and DMSC STAPs be given some clear direction as to what they are assessing in their advisory role. Given that both are integral parts of the ESS construction project, the milestones for each should be linked to the overall construction schedule of the ESS in order to ensure its early success as a world-class facility. The SAC requests evidence on the progress of this alignment – which should include, mission statements and milestones and how these tie in with the instrument construction milestones. These should be presented to the SAC both in the form of a written report and presentation – ideally by both the appropriate directors of SE and DMSC from the ESS as well as from the STAP chairs for each – at the next SAC meeting in November 2016.

Finally, the ESS recognizes that *going into construction, interfacing between the instrument teams and ESS is of paramount importance* and that *the STAPs will take on new functions in the context of the construction project*. To this end the SAC was asked to advise us on the structure and process presented.

The SAC recognizes that the scope-setting meetings will be the cornerstone of this activity and that the plans to provide the information delineated in the first page of this report will be presented by the ESS to the SAC in November 2016. The SAC would like to further emphasize that the STAPs be provided with some clear direction as to what they are meant to be assessing so that the criteria are well defined. Further, if the STAPs are to continue to be active beyond the scope-setting exercise, their roles need to be carefully defined.

Sylvia McLain & Andreas Meyer  
(Co-chair)            (Chair)