

## **SAC-17 – 18/19. May 2017**

**Location: ESS Construction site, Lund, Sweden**

### SAC members present:

Michael Preuss (Chair), Katia Pappas (Vice-Chair), Kristine Niss, Carmen Mijangos, Helena Van Swygenhoven-Moens, Toby Perring, Björgvin Hjörvarsson, Klaus Kirch, Roger Pynn, Richard Dronskowski, Marie Plazanet, Martin Månsson, Giovanna Fragneto, Kell Mortensen, Regine Willumeit-Römer, Stephen Hull.

### Apologies: Muhammad Arif

The SAC would first like to thank Science Directorate for providing the opportunity of visiting the construction site in order to see the scale of the project and obtain a picture of the immense progress that has been achieved in building the facility. The SAC would also like to congratulate Science Directorate for having defined the 15 initial scientific instruments that will be able to deliver world leading science.

### Ensuring early scientific success

The SAC recognises that after the selection process and scope-setting meetings the NSS is now moving into a new phase of the project with greater emphasis on delivering early scientific success and impact. Consequently, a great deal of discussion during the SAC meeting was around the specific meaning of scientific success and how to achieve it. The SAC recommends that NSS develops a clearer definition of what is scientific success for ESS and subsequently develops a strategy to ensure that such success is achieved. Further, the SAC recommends adopting a bottom-up approach for developing this strategy. The SAC expects that the definition of early scientific success will vary significantly for different instruments and therefore input for potential pathways should be requested from each individual STAP. The strategy for early scientific success should include considerations for requirements of specific sample environments and data analysis tools.

### Ensuring sustained scientific success

The SAC would like to reiterate that the upgrade budget of €56.4 M€ for instruments is essential for the scientific success of ESS and that the upgrade should be carried out in a timely manner. The SAC has already emphasised the importance of this in the SAC-16 report. Considering potential further saving requirements within the initial operational budget, the SAC would like to stress again that the full-scoping program for the instruments, which includes development of sample environment and software analysis tools, cannot afford any further savings as this would significantly reduce scientific impact of ESS.

### Early operation

Regarding the initial operation budget for ESS the SAC strongly recommends that the available budget is used to ensure reliable performance of the source and the 15 instruments and the start of scientific programs. For this, the SAC is convinced that a 2MW source is sufficient in the early days of the ESS because it already supports neutron scattering performance beyond that currently available today. In addition, an early upgrade to 5MW bears substantial technological and financial risks to the scientific program and will divert attention from the primary goal of achieving early scientific success. Hence, the SAC ranks the power upgrade at the lowest priority compared to any upgrade of instruments and sample environments as well as the expansion to 22 instruments.

The SAC-16 report had stated that some early stage upgrade is strongly recommended to ensure that the initial 15 instruments provide the step-change the scientific communities would expect from ESS. Indeed, the de-scoping exercise has left some instruments in a position where it is not clear if they will outperform other instruments at existing facilities in 2021/22. The SAC recommends that early upgrades of individual instruments, including more sophisticated sample environments and required data analysis tools, are now considered by the respective STAPs who will then make recommendations to the SAC and NSS. Regarding the process of identifying the instruments 16-22, the SAC supports the suggestion by ESS of issuing a call that would also allow previous teams of instrument proposals, including the VOR proposal, to resubmit updated proposals. The SAC strongly recommends that during the selection process instruments are prioritized that enable new communities to engage with ESS and that new capabilities are provided. The SAC would like to be briefed on the process to be used to decide on the remaining 7 instruments once that process has been developed.

#### The role of STAPs

As already pointed out above, ESS is now moving into a new phase with renewed emphasis on science, which needs to be reflected in the STAPs that cater for the approved instruments. Therefore, the selection of new STAP members should be reassessed with the view of increasing the number of potential instrument users. In contrast, the sample environment STAP should ensure that it focuses on operational aspects serving the science on all instruments. The STAP recommends that this is best achieved by including members who currently run sample environment suites at other large scale facilities.

The SAC is also convinced that the STAPs should continue to play an important role in shaping ESS and therefore it is important that they meet on a regular basis. The SAC recommends that STAP meetings take place a few weeks before each SAC meeting. However, as two STAP meetings per year for each instrument suite are difficult to organize, one of the meetings should be a brief online update meeting using tools such as WebEx. All STAP chairs, who are not already members of the SAC, should also be invited to attend the SAC meetings (but not the closed sessions), if necessary by video link. STAPs should help to shape the strategy for early scientific success and the provision of sample environments and data analysis tools in respect of individual instruments. Finally, as mentioned above, the STAPs should also be asked to prioritise essential/early upgrades and recommend timing for such updates that maximizes the scientific success. The STAPs should particularly stress early upgrades of instruments and the associated improved capability against continued early scientific output.

#### Data Management and Software Centre (DMSC)

The SAC was very pleased to see a detailed presentation from DMSC describing their strategy of developing data handling, data streaming, data reduction and analysis as well as data visualisation. DMSC is commended for their active engagement with the instrument community. Considering the importance of data analysis and the issues encountered by other facilities in developing those tools in a timely manner, the SAC recommends that the DMSC provides regular updates, i.e. at every SAC, on the development of such tools to the SAC. This will allow the SAC to judge if developments at DMSC are in line with the strategies for early scientific success. DMSC clearly faces a challenge of handling very large data sets once ESS is up and running and it is important that DMSC is given sufficient resources to continue to engage with other communities that have had these challenges for many years.

#### Scientific data policy

NSS provided an update on the scientific data policy proposed by ESS. ESS aims at adopting a data policy that is in line with all European countries making data available after a 3 year

embargo unless further protection is sought by the PI and keeping data saved for a further 10 years. NSS also explained to SAC the criteria by which data embargo can be extended and the SAC is fully satisfied with their approach. The main recommendation from SAC is that ESS provides the minimum required data storage period which satisfies all European countries as anything beyond such effort would put undue financial burden onto the ESS.

#### Sample environment

The SAC was very pleased by the presentation on the sample environment and support labs. The SAC acknowledges that the sample environment and support labs are a key factor for the realisation of early scientific success of ESS and acknowledges the progress in scope setting. The next step is a more accurate prioritization of the needs in line with the scientific requirements of the instruments for early scientific success and impact. For this reason, the SAC recommends that regular meetings are held with the instrument teams, following the example of DMSC. As for the DMSC, the SAC recommends that the sample environment and support lab teams report on the achieved progress at every SAC meeting. As with DMSC, this will enable the SAC to judge if developments at in this group are in line with the strategies for early scientific success.

#### Organisational issues

The SAC kindly requests that all relevant documents (including presentations) are provided at least one week prior to the meetings. It also recommends adopting more realistic agendas with shorter presentations and more time for discussions. The response to issues raised in previous SAC reports should be provided by ESS management in concisely written short statements (available to SAC before the meeting) and be part of the presentation by the science director.

The SAC acknowledges that the additional requests for feedback from NSS and the chairs of the STAPs is likely to require longer SAC meetings in the future, stretching over 36 hours, instead of the 24 hours duration adopted for the recent SAC meetings.