

Summary of BEER Scope-Setting

Meeting Date

14/10/2016

Location

ESS HQ, Tänkartanken

Chairman

Shane Kennedy

Attendees

Ken Andersen, Markus Strobl, Oliver Kirstein, Premek Beran, Jan Saroun, Rüdiger Kiehn, John Hedde, Martin Müller, Jochen Fenske, Erik Nilsson, Malcolm Guthrie, Irina Stefanescu, Douglas DiJulio, Gabor Laszlo, Thomas Gahl, Paul Barron, Richard Hall-Wilton, Phil Bentley (during final sessions)

A good case was made by the instrument team that the cost category instrument (configuration 1 of the scope-setting report) is (1) insufficient to deliver the early high-impact science which is needed and (2) not upgradeable to the full scope in a reasonable manner.

ESS management pointed out that the budget of the configuration 3 instrument is so high that it would preclude the delivery of another instrument within NSS.

It was agreed that the instrument presented as configuration 2 in the scope-setting report will form the basis of the scope and budget for BEER. It will be one of the world-leading instruments already at 2MW beam power and has an upgrade path to the full scope.

A number of adjustments have been made to that instrument configuration, some agreed at the meeting, and some discussed subsequently. The agreed scope and budget are summarised in the bullet points below.

- A cost book value of 14.987 M€ was agreed. This value is based on the configuration 2 instrument in the scope-setting report, with an initial budget of 17.936 M€, adjusted as follows:
 - The manpower costs after phase 1 were reduced to bring them in line with ESS labour rates: 60 €/hour for a scientist or engineer, and 48 €/hour for a technician. The resulting cost reduction was 594 k€.
 - Design changes to the beamport insert in the monolith had been costed at 50 k€. This is not needed, as it is covered by an ESS budget.
 - Four choppers were removed from the scope: PSC3, MCB, FC1a, FC2a (using the naming conventions of the slides presented at the meeting). This will still allow flexible and high-performance operation and results in a net cost saving in the budget for choppers of 753 k€.
 - The stress rig was removed from the scope, resulting in a cost saving of 300 k€ (see note 1).

- The hardware development cost for the diffraction detectors of 276 k€ was removed from the budget, as it is already funded by an NSS work package for detector development.
- An amount of 150 k€ was added to the budget to cover the cost of back-end detector electronics, needed to comply with ESS data acquisition standards.
- Most of the sample movement can be performed by the 2 tonne hexapod, therefore
 - The sample positioning control system costed at 100 k€ was removed from the budget.
 - The high load table costed at 300 k€ was removed from the budget and should be replaced by a lift/crane for mounting the sample into the beam and a rotation stage, valued at a total of 100 k€, resulting in a net budget reduction of 200 k€.
 - The X, Y, and Z linear stages were removed at a total cost of 30 k€.
- The travel budget was reduced from 300 k€ to 150 k€.
- The cost of the instrument cave was reduced from 500 k€ to 250 k€
- The cost of the control hutch was reduced from 280 k€ to 250 k€.
- The cost of the personnel safety system (PSS) was reduced from 177 k€ to 127 k€.
- The contingency was recalculated to represent 10% of the remaining cost items after phase 1.

Notes:

1. NSS management acknowledges that a high-performance stress rig is essential for day one operation of the instrument. We therefore wish to ensure that funding is secured in the near term. NSS management will wait to learn if the grant application for the stress rig and furnace are successful (expected to be known before TG2). The case for inclusion of a stress rig and furnace in the instrument scope and budget will be re-examined following the outcome of these grant applications.
2. The instrument should be designed in such a way that the choppers not included in the scope (the four choppers mentioned above, as well as the MCc chopper) can be added later.
3. ESS will propose to Council that BEER is one of the first 8 instruments.
4. Procurement of critical items (e.g. shielding and optics) could start before TG3, provided the BEER team provides compelling evidence that this does not present a design risk to the project. The BEER team needs to work closely with ESS if it wishes to include this in the early procurement plans.
5. The staging plan outlined in the scope-setting report should be updated based on the outcome of the scope-setting meeting.
6. The BEER team are encouraged to use any savings identified, e.g. during the detailed engineering design phase, to increase the agreed scope summarised above, while maintaining contingency at 10% of cost to completion.