

SWG Chairs Telecon 16-April-2019

Meeting Notes: Jeff Wagg

Participants: SWGs: Tao An, Justin Bray, Garrelt Mellema, Jason Hessels, Cormac Reynolds, Stijn Buitinjk, Natasha Hurley-Walker, Eduard Kontar, Grazia Umana, Ann Mao

Apologies: Mark Thompson, Divya Oberoi, Francoise Combes, Richard Battye, Lourdes Verdes-Montenegro, Doug Johnstone, Phil Edwards, Gianni Bernardi, Willem van Straten, Mark Sargent, Sebastien Muller

SKAO: Robert Braun, Jeff Wagg, Evan Keane, Tyler Bourke

*Topic: Schedule*

RB: These slides were shown last week, but I want to spend a bit more time on the schedule. The schedule is tied to some key external events, such as the beginning of construction that depends on having the SKAO Council in place to approve a Construction proposal. There is a lot of activity going on between now and September to finalise the construction and roll-out schedules, both here in the office and also involving key people from the former Element Design Consortia who are contributing to the System CDR in December. There are a few outstanding items shown in black on slide 3, such as Dish sub-elements that must still occur. The Engineering schedule is shown in slide 4. One new item is array assembly 0.5, which appears in the first quarter of 2023, when 4 dishes and stations would begin commissioning. T0 is the formal start of construction at the beginning of 2021, following approval by the SKAO Council. This is followed by C0, the date when major construction contracts would enter force. During construction we have a series of array assembly (AA) milestones which are milestones when a certain number of antennas or stations are available to begin the process of engineering commissioning and ultimately science commissioning.

On Slides 6 – 8 you see the scientific milestones for which we would like to solicit your feedback. In particular, we want to achieve science early and effectively without getting in the way of construction. The downward arrows in Slide 6 are meant to indicate when things get on the telescope. Even at AA0.5 scientific commissioning can begin. We do anticipate KSP involvement from an early stage so that the teams get real telescope data (e.g. beams) and opportunities for the earliest possible science publications. This was fleshed out in the email I sent around this morning and will be shared with the entire SWG community. Mark S. and others have echoed concerns that formal KSP observing may not begin for another 10 years, although there might be many KSP-relevant activities that could start much earlier, which could be further highlighted. We want to be as realistic as possible regarding when people can expect science data. Please help us to refine the current estimates of activity durations and external dependencies so that we can communicate the various milestones most effectively.

NHW: Slide 5 shows engineering and science milestones, but what about the ramp up of Regional Centres, which may play a larger role than previously thought. Where is that development in this schedule?

RB: The basic model for central production of science data products has not changed. It is still seen as the Observatory responsibility to produce fully calibrated “single-track” data products, once steady state operations are underway. The additional processing at the Regional Centres (co-adding of image cubes, mosaicing of wide areas, etc.) should not be that computationally demanding. However, during commissioning there is an important SRC role in tuning the calibration strategy and pipeline optimization that will require significant resourcing. Planning for SRC development is now underway within the SRC Coordination Group. Those developments need to be closed coupled with the Engineering and Science Milestones and it would be helpful to merge Milestones in the SRC area with the Integrated Schedule in Slide 5 to make the connections and timing clearer. Thank you for bringing this up.

JH: In the science commissioning phase, do you envisage that the telescope will be available for early KSP proposals where small amounts of data might be available?

RB: It sounds like you are describing the Science Verification phase, which would begin from AA2 when about half of the array is available. It would certainly be possible for KSP Teams to suggest targets for commissioning observations. Other early KSP opportunities would also exist in the Shared Risk and PI proposal categories to enable pilot observations to get underway. One of the early limitations may be the availability of TM and SDP functionality, which may limit what can be done. On the other hand, the movement to a SAFE development framework for all software components, with early prototyping of key functionality, may offer some prospects for early observations.

NHW: I was thinking of this from an imaging point of view, in the case of MeerKAT, it will be quite late in construction (AA2+) when the collecting area of MID becomes competitive, although having longer baselines might already allow exploration of new parameter space, whereas for LOW it may happen earlier with respect to the MWA.

RB: It is exactly those types of consideration that have led to the current estimate of when the Science Verification phase should begin, namely AA2+9 months, which would correspond to 64 SKA MID dishes and 64 SKA LOW stations having undergone a preliminary degree of commissioning.

JB: You mentioned that experiments that do not require imaging data may be able to start earlier? We care about how soon antennas will be on the ground and do not require either the correlator or a station beamformer.

RB: There is a roll-out plan for each of SKA1-Low (SKA-TEL-AIV-4410001R7) and SKA1-Mid (SKA-TEL-AIV-2410001R7),

[https://www.dropbox.com/s/76vn91t06gynk72/SKA-TEL-AIV-4410001-SE-RP-MPL-Rev7-Roll-Out%20Plan%20for%20SKA1\\_LOW%20-%20signed.pdf?dl=0](https://www.dropbox.com/s/76vn91t06gynk72/SKA-TEL-AIV-4410001-SE-RP-MPL-Rev7-Roll-Out%20Plan%20for%20SKA1_LOW%20-%20signed.pdf?dl=0)

[https://www.dropbox.com/s/lhmkj6k6k4h3b2a/SKA-TEL-AIV-2410001-SE-RP-MPL-Rev7-Roll-Out%20Plan%20for%20SKA1\\_MID%20-%20signed.pdf?dl=0](https://www.dropbox.com/s/lhmkj6k6k4h3b2a/SKA-TEL-AIV-2410001-SE-RP-MPL-Rev7-Roll-Out%20Plan%20for%20SKA1_MID%20-%20signed.pdf?dl=0)

that spells out the foreseen timeline for availability of all components. There is quite a complex sequence of parallel deployments of the various systems, so there is no really simple answer to the question in general. Depending on exactly what functionality is needed determines how soon it might be available. These roll-out plans are being developed further and will evolve until the System CDR.

*Topic: Science milestones*

RB: We would like feedback from you on the tables on Slides 7 and 8. Are the various durations and dependencies correct? Document 822 is a living document and will be updated as better information becomes available.

JH: It would be helpful if we are able to discuss ways in which some of the early array releases might be used to produce science results.

RB: **action:** If you and Justin could send me a few lines of text describing some ideas on how we might be able to use some of these early array assemblies for non-imaging applications, I will check with the engineers to ensure that we are being reasonable and then add this to Doc 822.

GM: The time interval between the KSP proposal call and KSP scheduling on Slide 8 is 34 months and seems long? Also, the time of KSP scheduling of 24 months after AA4 also seems long?

RB: The 34 month interval between the KSP proposal call and KSP scheduling is meant to provide 12 months of time for proposals to be written, 4 months for the review process and another 18 months between the moment of time allocation and the beginning of observations to allow for KSP Team resourcing. The 18 months resourcing duration was introduced by request of our SWGs, since the previously assumed 12 months were not thought sufficient.

The start date of KSP observations, AA4+24 months, is the current estimate of when the full array might be sufficiently commissioned (in both engineering and science aspects) to allow scheduling of the most demanding KSP projects. This estimate is based on consultation with Robert Laing, the SKA System Scientist in November 2017. Once the full Commissioning Plan (that is now being written) is available, then this estimate will be updated. If it proves possible to compress commissioning into a shorter timeframe, then this will be done.

EdK: Why are MID and LOW shown to be on the same timeline? Might it not be possible that one is ready before the other?

RB: Current estimates have quite similar AA4 dates for both LOW and MID. If it turns out that one or the other is ready first, then it is very likely that Science Operations would also begin first on the system that is ready.

EdK: It may be good for the project if one of the telescopes were ready to start producing science even if the other is not.

RB: We do not anticipate artificially holding one back, and there could easily be a difference between the two.

*Topic: upcoming meetings*

RB: In addition to several recently announced meetings is the next SKA Engineering/Ops meeting toward the end of November in Shanghai. This will include various sessions on commissioning and operations, including SRC coordination.

*Topic: SWG banners and science meeting*

RB: The banners can be downloaded and look great. Feel free to make use.

RB: The meeting venue had an excellent meeting room and good IT and catering. Would all of you please make presentations from the breakout sessions available to us and we will post them centrally. That would be appreciated.

GM: How do you want these?

RB: Please send a tar bundle of the pdfs. Make sure that the authors are ok with you posting their slides, and Evan will send around a DropBox link to upload these.

RB: AOB?

GM: There were two points that came up at last week's meeting that I want to repeat. The first is the testing of the SKA LOW antennas. There is a strong feeling that members of our group would like to look at the antenna test results (Cath and Andre). The other point relates to what fraction of the total EoR calibration and further processing is done by SDP. We would like to provide input on a suitable hand-over point and the possibility of significant data compression.

RB: That discussion would be very welcome. The work on the overall calibration strategy highlights the importance of doing as much calibration as possible centrally, prior to compression and transmission to the SRCs.

TA: You mention regular KSP workshops, how frequently would they occur?

RB: The question is really for you, the SWG Chairs, what do you feel would be the right cadence?

TA: I will discuss with our team and get back to you. My other question relates to the commensality of VLBI with other science groups; we want to know how best to promote this in the future. There is a VLBI KSP workshop in October where commensality will be discussed, and this could lead to some suggestions. For the Shanghai meeting, if anyone wishes to demonstrate pathfinder or precursor results or learnings, please let us know and we can schedule that.

RB: Thanks again and please remember to send the presentation slides from last week's breakout sessions.