Recommended assumptions pending full definition of Baseline Design Version 2

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In his presentation on SKA1 Rebaselining to the SKA Board (SKA-BD-17-13a), the Director General recommended the following:

- *"SKA1-Mid in South Africa should be built, incorporating MeerKAT. 70% of the planned 190 SKA1 dishes should be constructed with a target of delivering baseline lengths of 150km, but with a fallback of 120km if funding is constrained. Receiver bands 2, 5 and 1 should be constructed for all SKA1-Mid dishes, with their priority order as written. Capability to form and process 50% of the planned pulsar search beams should be delivered.*
- *"SKA1-Low in Australia should be built. 50% of the planned 262,144 low frequency dipoles should be deployed. The array should cover the frequency range 50-350 MHz, as planned. The current planned baseline lengths of ~80km should be retained. The inclusion of a pulsar search capability for SKA1-Low (currently an ECP on hold) should be actively explored.*
- *"SKA1-Survey in Australia should be deferred.*
- *"In addition, an SKA Phased Array Feed (PAF) development programme should be initiated as an Advanced Instrumentation Programme, funded from the SKA1 construction budget at a level of €20M."*

In SKA-BD-17-13c, it is clarified that 64K spectral channels are to be used as the upper limit.

These statements are definitive currently. The final telescope definition will be delivered in mid 2015. Until the final definition of BDv2 is available, we recommend the following shared-risk assumptions:

SKA1-Mid:

1. 133 SKA1 dishes shall be built for SKA1-Mid.
2. MeerKAT shall be integrated into SKA1-Mid.
3. The maximum baseline shall be 150km.
4. All three bands 2, 5, 1 shall be built. The cryostat for bands 3, 4, and 5 shall be built.
5. The maximum number of spectral channels transmitted from the SKA1-Mid correlator to SDP-Mid shall be 65,536. The maximum bandwidth will remain as specified in Level 1 requirements, version 5.

SKA1-Low:

1. 512 stations of 256 antennas shall be built.
2. The telescope build shall be staged to mitigate calibration risks (See the SEAC report, SKA-BD-17-13e, for motivation). Stage 1 will deploy and utilise the remote stations to demonstrate successful calibration, followed by Stage 2, the full build out of the core.
3. The longest baselines shall be ~ 80km.
4. The remote stations shall be distributed more uniformly in Boolardy Station than in Baseline Design V1.
5. The antennas shall be of the current log-periodic design. The full frequency range

shall be 50 – 350MHz.

6. The maximum number of spectral channels transmitted from the SKA1-Low correlator to SDP-Low shall be 65,536. The maximum bandwidth will remain as specified in Level 1 requirements, version 5.

General:

1. Capabilities will be built as required, without expenditure for possible future expansion.
2. For the majority of designs presented at PDR only limited redesign and scaling are necessary. Some cost-driven re-optimisation may be required.
3. A total of 1111 pulsar beams shall be built for SKA1-Mid and SKA1-Low but, following full acceptance of ECP140006, these shall be divided between SKA1-Mid and SKA1-Low in proportion yet to be determined.