Baseline Design Change

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Summary

• **The Baseline Design will not change** until:
  – A – Responses to the RfP are received and the bid clarification process is over, AND
  – B – The cost of an SKA1 conforming to the Baseline Design has been presented to the Board, AND
  – C – Changes have been proposed, supported by evidence, analysed for risk, cost and schedule, and approved

• Errors (factual, numerical and grammatical) will be corrected and published as soon as they are detected
Change

• Change is expected and is usually necessary
• Programmatic considerations must play a major part
  – Resistance to change increases monotonically with time
  – Evidence in support of decisions also increases over time
• The principal criterion for assessing change is cost
  – A benefit value system is required
• Change management is a ‘top down’ function
Baseline Design scope

Science Domain
- Cosmological & astrophysical phenomena - energetics, location, acceleration, scale of structures, composition, variability, etc, etc
- Foreground subtraction, de-dispersion, on-sky calibration, pulsar timing schemes, ....

Instrumental Domain
- Capabilities to measure characterised by spectral, complex radiometric, spatial, & temporal ranges and resolutions
- Local calibration, artifact removal, RFI excision, ....

Engineering Domain
- Scaled technologies & how they work together

The Baseline Design scope
The Baseline Design as a baseline

• The Baseline Design is an engineering document fully under the control of the SKA Office
  – It is therefore subject to Engineering Change Management

• The design is being costed and also analysed in terms of its potential science return
  – Costing and analyses take significant time

• Thus the BD is to be held unchanged to allow this work to conclude
Control - method

- Engineering Change Management Procedure - SKA-TEL.SE.CONF-SKO-PR-001
  - All steps documented
  - Time constrained
  - Executed at DSci/PM/SKAA/HoP/D-G level
  - Involves appropriate consultation
<table>
<thead>
<tr>
<th>Milestone number</th>
<th>Short description</th>
<th>Latest date</th>
<th>Location</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kick-off meeting</td>
<td>T0</td>
<td>Consortium premises</td>
<td></td>
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<tr>
<td></td>
<td>Progress meetings</td>
<td>T0+4 weeks</td>
<td>Telecon or Consortium premises</td>
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<td>2</td>
<td>Requirements Review - Finalisation of TBC’s and TBD’s in specification and setting of target cost for element.</td>
<td>T0+12 weeks</td>
<td>Consortium premises or SKA offices</td>
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<td>3</td>
<td>Submission of stage 1 (PDR) data package</td>
<td>T0+52 weeks</td>
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<td>4</td>
<td>stage 1 review meeting (SRR &amp; PDR)</td>
<td>T0+60 weeks</td>
<td>Office of the SKA or consortium offices</td>
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<td>6</td>
<td>Closure of stage 1</td>
<td>T0+68 weeks</td>
<td>N/A</td>
<td>Start of stage 2</td>
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</table>
Cases for change – SKA1_Low

• Lower frequency limit change
  – Existing constraints, plus widespread impacts

• Peak sensitivity frequency change
  – Widespread impacts

• Number of beams/beam size/station size
  – Programmatic tension between increasing resistance to change vs improving rationale for change
    • Experience with aperture array instruments
Swift XRT Engineering Change example

In 302-3041 - We are trying to get accurate (5") GRB positions to the ground very quickly for optical follow up. The onboard SW was taking an image and then finding the source in the image, centroiding and sending the centroid position to the ground via TDRSS in seconds. The actual image was coming down later (90 minutes) via the Malindi downlinks from the solid state recorder. However, some bursts were not nearly as bright as expected and so in the longer 2.5 s exposure there were frequently cosmic rays or sometimes only cosmic rays that screwed up the position. However, the image wasn't being reported quickly only the position. This would send the ground observers on a wild goose chase. What we were asking for is to send the image with the position through TDRSS so it could be vetted for cosmic rays before the position went to the GRB community.

Courtesy - Joe Hill, GSFC