



**PUBLIC MINUTES of the
Mid-term Teleconference Meeting
of the
International SKA Steering Committee**

27 November 2007 at 21:00UTC

Present:

Chair	Brian J Boyle
Secretary	Richard T Schilizzi (Director, ISPO)
Australian SKA Consortium	Brian J Boyle Peter Quinn (until 22:00 UTC)
Canadian SKA Consortium	Peter E F Dewdney A Russ Taylor
National Astronomical Observatories, Chinese Academy of Sciences	Bo Peng
European SKA Consortium	Philip J Diamond Luigina Feretti Michael A Garrett Peter N Wilkinson J Anton Zensus
US SKA Consortium	Jim M Cordes (from 21:20 UTC) Ken I Kellermann T Joseph W Lazio Robert A Preston Jill C Tarter Yervant Terzian
At Large	Ron D Ekers
Invited	J Colin Greenwood (Executive Officer, ISPO)

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0. Welcome by ISSC Chair

Boyle opened proceedings at 21:00 UTC and welcomed ISSC members to the mid-term telecon of the International SKA Steering Committee.

1. Confirmation of Representation & Quorum

Boyle confirmed that, with the minimum of 4 members each from the European, Rest of World and US groupings, there was a quorum for the telecon, He passed on apologies from *Brouw, Jonas, Rao, Ulvestad, van Ardenne* and *van Driel*.

2. Approval of Draft Agenda (Doc. 071127-2.0)

Boyle noted recent revisions to the agenda:

- International Collaboration Agreement and the MoA to establish the SPDO (Item 5.1). The action has been changed to 'Approval'. The agreements were approved at ISSC18; however, the text was changed after that approval following feedback from the SKA Forum.
- SKA Forum (Item 5.4). The action has changed from 'For Information' to 'For Discussion/Noting'.
- Forward Look Budget 2009-11 (Item 7.3). The action has changed from 'For Discussion/Approval' to 'For Discussion'.
- Leave Liability (Item 7.5). This item, a late addition to the agenda, was withdrawn because the issue had been resolved prior to the telecon.

The ISSC approved the new agenda. Decision [071127.1]

3. Approval of minutes

Prior to this meeting, feedback on minor typos, etc in the ISSC minutes and XC071105 summary was received from *Brouw, Peng, and Ulvestad*.

3.1. ISSC 18 (Doc. 071127-3.1)

Wilkinson pointed out a typo error (p13). *Ekers* advised that he had comments and clarifications and would forward them to *Greenwood* after the meeting.

ACTION [071127.1]: *Ekers* to send his comments about the ISSC 18 minutes to *Greenwood*.

Greenwood asked whether the use of bracketed sentences in sections 8.2.1 and 8.2.4 in reference to post-meeting events was acceptable. *Wilkinson* suggested prefacing with 'Note added after meeting'. There was general agreement with this suggestion.

Boyle referred to Section 10.3 (Roadmap and Strategy for US Decadal Plan, p27) and pointed out that the ISSC does not have a policy for a two stage site selection process (for SKA-lo/mid and SKA-hi). The ISSC has decided previously that any selected site should come only from the sites that have submitted a proposal for the selection procedure. *Lazio* explained that the statement reflected sentiment in the US rather than ISSC policy, but agreed to revise his statement to clarify the issue.

ACTION [071127.2]: *Lazio* to qualify his statement regarding his reference to a two stage site selection process in Section 10.3.

Boyle referred to Section 11.7 (SPDO and CDIT Recruitment 2, p33) and noted that the SKA Forum does not have a mandate to agree to Common Fund payments, rather that the expectation at the time was for the SKA Forum to provide guidance on recruitment issues.

Boyle suggested that the ISSC should approve the private and public minutes of ISSC 18 by email ballot when Lazio's revision has been made.

ACTION [071127.3]: Boyle to organise an email ballot for the ISSC to approve the private and public ISSC 18 minutes.

3.2. XC071105 Telecon Summary (Doc 071127-3.2)

Boyle requested comments about the XC071105 telecon summary. None were forthcoming.

4. Preliminary SKA Specifications (Docs 071127-4.0a and 071127-4.0b)

Schilizzi started by complimenting the Specifications Tiger Team on all their hard work over the past 6 months. He explained that the purpose of the document is to set out preliminary top level specifications and representative implementations of the SKA, as well as to provide a starting point for CDIT design activities for PrepSKA in 2008.

Schilizzi noted that a number of changes have been made to the document since ISSC 18, taking into account feedback from the ISSC, the SKA Forum and the wider radio astronomy community (SKA2007). The key changes were to:

1. Re-introduce the concept of a phased implementation of the SKA, including Phase 1 (SKA-mid), Phase 2 (SKA-lo/mid) and Phase 3 (SKA-lo/mid/hi);
2. Reduce rms surface accuracy from 2.5 to 1.5 mm in order to operate at 10 GHz with relatively high efficiency;
3. Reduce the scaling factor (from 4 to 2) for mass production runs of > 1,000 sensors. Together with the increased rms surface accuracy, this has increased component costs for Phase 2 of the SKA from €600-800 M to € 1,000 M;
4. Increase the target cost of Phase 1 has increased from € 250 M to € 300 M, thus allowing proportionally more money to be spent on components (now € 200 M) as opposed to infrastructure (€100 M). € 30 M of component costs is reserved for Aperture Array technologies. Phase 1 now represents approximately 20% of the cost (and 15 % of the collecting area) of the full SKA;
5. apply the performance-cost estimation tool to ASKAP and MeerKAT Pathfinder instruments as well as to Phase 1 of the SKA in order to ensure parity of cost assumptions. Sensors from the Pathfinders are now included in the Phase 1 configuration options. This has resulted in an increased differential in performance between Phase 1 and the Pathfinders. For example, the Phase 1 instrument now has 5x the $A_{\text{eff}}/T_{\text{sys}}$ of MeerKAT and 25-30x the Survey Speed Figure of Merit of ASKAP;
6. Revise Tables 1 to 3. $A_{\text{eff}}/T_{\text{sys}}$ is a maximum of $2,000 \text{ m}^2\text{K}^{-1}$ for Phase 1 and a maximum of $12,000 \text{ m}^2\text{K}^{-1}$ for Phase 2 (depending on implementation). Survey Speed Figure of Merit is a maximum of 3×10^7 for Phase 1 and a maximum of 2×10^{10} for Phase 2 (depending on implementation);
7. Include reference to Phase 3 in the SKA time line (Figure 1, p11); and
8. Revise text throughout the document, but particularly technical challenges (Sections 7) and trade-offs (Section 8).

Wilkinson noted a lack of costs in Figures 11 and 12 (p54). Schilizzi explained that component costs for the Pathfinders were investigated using the performance-cost estimation tool and that the results were projected into Phase 1 cost estimations (using scaling factors for time, e.g. Moore's Law). Phase 1 performance is now based on these cost assumptions.

Schilizzi noted the pre-meeting correspondence from the USSKAC suggesting that the preliminary specifications document should refer to goals rather than specifications. Quinn made a pre-meeting response to this suggestion which strongly opposed to any down grading of the role of the specifications documentation, advocating that they are exactly the kind of preliminary specifications expected in a major project. Schilizzi concurred with Quinn's response.

Preston felt that the term 'preliminary specifications' was acceptable and that it should be used consistently throughout the document; he suggested that this term should be defined in the Executive Summary. He also suggested that the Executive Summary should include a description of how the preliminary specifications might evolve over time.

Wilkinson noted that the Executive Summary refers to science specifications, top level specifications and top level cost driving specifications. He suggested that the terminology should be standardised or explanations provided about the different types of specification.

Cordes recommended that the Executive Summary should state the purpose of the document, i.e. as a source of reference for the SKA Specifications Review Committee (SSRC) in January 2008. *Schilizzi* added that it will also be used as a starting point for CDIT design activities during PrepSKA project.

Kellermann suggested that the emphasis on costs in the document should be reduced, and reference to costs removed from the Executive Summary. *Schilizzi* replied that the document attempts to indicate the level of funding required and what can be done for that money. *Wilkinson* felt that it is important to include costing details in the Executive Summary because readers wanting to know costs would be frustrated by having to search the document for this information. *Quinn* agreed that cost information should be included in the Executive Summary.

Garrett thought that the Executive Summary is too short, given the complexity of the document, and that some of the tables are difficult to understand. *Preston* expressed his agreement and added that the Executive Summary should probably be 2-3 pages long, provide a clear summary of all aspects of the report, define key terms (e.g., specifications), and be written for a broad audience. *Boyle* encouraged the ISSC members to consult with colleagues about the readability of the document. In addition, he felt that the caption for Table 2 would benefit from a breakdown of Phase 1 costs.

ACTION [071127.4]: Garrett to email Schilizzi with recommendations for improving the clarity of Tables 1-3.

Diamond stated that the European Astronet initiative is approaching a critical point in the drafting of a prioritised roadmap for achieving target science goals. He explained that he has an action to provide an update on SKA progress by 7 December 2007 and that the Preliminary Specifications document would provide an excellent input into the process. *Diamond* suggested that some readers would only look at the Executive Summary and so it would be essential to include cost information in this section of the document. *Kellermann* expressed unease at the document being made public before it is reviewed by the SSRC. *Dewdney* thought that the draft document could be circulated publicly before the SSRC meeting because an earlier draft version is already publicly accessible on the international SKA website. The final document would be sent to the SSRC and placed under version control.

ACTION [071127.5]: Schilizzi to make the following changes (by 2 December 2007) to the Executive Summary of the 'Draft Preliminary Specifications of the SKA': (a) change 'specifications' to 'preliminary specifications', (b) standardise use of, and define, the term 'specifications', (c) state the purpose of the document, (d) identify the target audience, (e) clarify the summary of Tables 1-3, (f) provide a breakdown of Phase 1 costs in the caption of Table 2, (g) increase the length of section to 2-3 pages.

Motion: *Dewdney* moved to approve the 'Draft Preliminary Specifications of the SKA' document for public circulation prior to despatch to SSRC members, conditional upon the revisions identified in AI 071127.5 being made. Reference to the term 'draft' should be removed from the document sent to SSRC members, and version control should be applied.. *Terzian* seconded this motion. The motion was carried unanimously. **Decision [071127.2]**

Quinn left the telecon at 22:00 UTC. *Boyle* confirmed that a quorum remained for the meeting.

5. Governance

5.1. International Collaboration Agreement and the MoA to Establish the SPDO (Docs 071127-5.1a and 071127-5.1b)

Boyle reported that, following guidance from the SKA Forum, several changes were made to the agreements approved by the ISSC at ISSC 18. These changes were:

- (a) International Collaboration Agreement
 - o Define the meaning of 'Common Fund'
 - o Replace the acronym SSEX with the term SSEC Executive Committee
- (b) MoA for SPDO
 - o In Annex 2, replace 'Payments Table' with 'Proposed Payments Table'
 - o In Annex 2, replace 'JIVE, The Netherlands' with 'JIVE, Europe'
 - o In clause I.2.b, the Proposed Payment Table will be updated every year *with the concurrence of participants*.

Motion: *Taylor* moved to approve the changes suggested by the SKA Forum to the International Collaboration Agreement and the MoA to establish the SPDO, and *Terzian* seconded this motion. The motion was carried unanimously. **Decision [071127.3]**

5.2. Supplementary SPDO-JBCA Hosting Agreement

Schilizzi reported that the drafting of this agreement is nearly complete and that it is intended to circulate the agreement for noting by the ISSC by 30 November 2007.

5.3. Audit Committee Membership

- (a) Membership

Boyle explained that the Audit Committee would review the suitability of contributions for inclusion in the 'In-kind Contributions Register' and apportion a value to the SKA of these contributions. He noted that, at ISSC 18, it was agreed to have two representatives each from Europe, Rest of World and the USA. *Brouw* and *van Ardenne* have been nominated to represent Europe and expressed a willingness to serve on the Audit Committee.

Boyle stated that nominations were still open and asked whether the ISSC members wanted to make further nominations.

ACTION [071127.6]: *Ekers* to establish the willingness of to Chair the Audit Committee. *Boyle* to make a formal representation to the target candidate, if appropriate.

ACTION [071127.7]: *Boyle* to establish the availability and willingness of target candidates to serve on the Audit Committee.

(b) Terms of Reference

Boyle stated that the Terms of Reference for the Audit Committee have yet to be drafted, but will be done so by the ISSC Chair and ISSC Secretary.

Boyle confirmed that the membership and terms of reference of the Audit Committee will be submitted for approval to the SSEC at SSEC 1 (April 2008).

5.4. SKA Forum (Doc 071127-5.4)

Boyle reported that feedback following the SKA Forum was positive [see XC071105 summary], although there was a great deal of concern expressed by funding agencies about plans to drop the phased implementation approach.

Boyle stated that the next SKA Forum meeting is provisionally scheduled for 3-4 April 2008 in Perth Australia, i.e. just before SSEC 1. Planning for the event is under way by the Australian Government's Department of Education, Science and Training (DEST) and a draft proposal is expected to be sent to the ISSC in early December. He noted that the aim will be to create a "significant and inclusive" event involving a broad range of stakeholders to establish wider support for the SKA program.

Kellermann thought that the SKA Forum should be held after SSEC 1 so that SSEC outputs could feed into the SKA Forum meeting. *Boyle* responded that there was also benefit in the outputs of the SKA Forum feeding into SSEC 1, and cited the issue of phased implementation at the last SKA Forum as an example.

Terzian asked whether funding agencies had been consulted on this proposed change of format. *Boyle* was unaware of the full list of organisations consulted by the DEST, but confirmed that the National Science Foundation (NSF) had been involved in the decision-making process.

Ekers expressed concern about the negative reaction of some funding agencies to the 'Open Skies' resolution, passed by the ISSC at ISSC 18. He felt that there was a lack of understanding about the implications of this resolution and suggested providing a presentation on this subject at the next SKA Forum meeting.

ACTION [071127.8]: *Terzian* to investigate whether there is a publicly available 'Open Skies' policy document in the US.

ACTION [071127.9]: *Kellermann* to arrange for the Operations Working Group to develop a more comprehensive 'Open Skies' policy for the SKA.

6. PrepSKA Update (Doc 071127-6.0)

Diamond apologised that the PrepSKA agreement was not completed in time to provide the supporting paper, but final adjustments are now being made to the IPR clauses.

Diamond confirmed the intention that the agreement will be signed by mid-December 2007, with the project starting on 1 April 2008 and money becoming available in May-June 2008. It is possible that the first PrepSKA board meeting could be held in Perth in conjunction with SSEC 1. He noted that the delay in the start of the project until April 2008 provides an opportunity for senior CDIT engineers to be in place on commencement of the project.

Tarter asked about the impact of the delay in starting PrepSKA on SKA time lines. *Schilizzi* confirmed that the SKA time lines will be set back by 3 months.

7. ISPO Report

7.1. IEAC Membership and Terms of Reference (Doc 071127-7.1)

(a) Membership

Schilizzi reported that the International Engineering Advisory Committee (IEAC) membership list reflects the selection made at ISSC 18. A Production Mass Manufacturing Engineer has yet to be identified to invite onto the IEAC. The original candidate that *van Ardenne* had in mind has changed employers, but *van Ardenne* has further ideas to pursue.

Ekers noted the failure to obtain a wide global distribution in the list of candidates. *Boyle* stated that he would discuss this matter with the IEAC Chair and suggest the possibility of extending the membership to include engineers from the pathfinder projects. *Schilizzi* cautioned against involving individuals associated with specific technologies under consideration for use by SKA.

Kellermann and *Dewdney* cautioned about inviting individuals with potential commercial conflicts of interest.

Boyle concluded that the ISSC is not yet able to approve initial membership of the IEAC, but that a greater global distribution of candidates is required. He requested that ISSC members consider alternative candidates by 7 December 2007.

ACTION [071127.10]: *Schilizzi* and *van Ardenne* to discuss possible candidates for the Production Mass Manufacturing Engineer role.

ACTION [071127.11]: *Boyle* to organise an email ballot for the ISSC to approve a revised IEAC candidates list, with two additional candidates, by the end of 2007.

ACTION [071127.12]: *Boyle* to invite selected candidates to serve on the IEAC in January 2008, with responses to be collated in time for SSEC 1.

(b) Terms of Reference

Schilizzi reported that IEAC Terms of Reference were updated to take into account comments made at ISSC 18 and the delay of 3 months to the start of PrepSKA. The first IEAC meeting has been rescheduled to the end of February 2009. The IEAC will be tasked with further work in 2010 and 2011, but not necessarily with the same membership.

Motion: *Diamond* moved to approve the Terms of Reference for the IEAC, and *Terzian* seconded this motion. The motion was carried unanimously. **Decision [071127.4]**

7.2. SPDO and CDIT Recruitment

Schilizzi reported that the deadline for applications for the post of the SKA International Project Engineer is 30 November 2007. Advertising for the post has been handled by the University of Manchester. The recruitment process for senior CDIT engineers will commence once the PrepSKA agreement has been signed, which is likely to be mid-December 2007.

7.3. Forward Look Budget 2009-11 (Doc 071127-7.3)

Schilizzi reviewed the Forward look Budget 2009-11 and noted the significant increase in Common Fund contributions required to pay for the posts of International Project Scientist and Outreach Officer (assuming in-kind contributions for these roles do not continue beyond 2008).

7.4. Budget 2008 (Doc 071127-7.4)

Schilizzi reported that the changes requested at ISSC 18 have been implemented:

- New header added for cost of living adjustments for seconded SPDO staff.
- New headers added for the International Project Scientist and Outreach Officer.
- New header added for contingency.
- Income included in the Budget to make explicit the forecast 'carry over' balance from 2007.

Schilizzi noted that the budget is an income and expenditure forecast based on cash flows and so has zeroed the salaries of the International Project Scientist and Outreach Officer, posts which are being provided as in-kind contributions from the US and the University of Manchester, respectively. *Boyle* commented that these in-kind contributions should be included in the 'In-kind Contributions Register'.

Tarter stated that contingency is usually a fixed percentage of project cost. *Boyle* suggested that the contingency header should be changed to 'unallocated', with a note that this money acts to mitigate the effects of any unpaid Common Fund dues.

Zensus thought that the European income should make reference to Radionet and SKADS. *Schilizzi* replied that the breakdown of European contributors reflects the payments table in the MoA to establish the SPDO. *Diamond* suggested removing the breakdown of European contributors from the forecast of income; *Wilkinson* agreed.

ACTION ITEM [071127.13]: *Schilizzi* to make the following changes to the Budget 2008: (a) change the header from 'contingency' to 'unallocated' and add a note that this money acts to mitigate the effects of any unpaid Common Fund dues, and (b) remove the breakdown of European contributors from the forecast of income.

Motion: *Terzian* moved to approve the Budget 2008, conditional upon implementation of the changes listed in AI 071127.13, and *Wilkinson* seconded this motion. The motion was carried unanimously.

Decision [071127.5]

8. AOB

No other business was discussed.

9. Closing Remarks

Boyle thanked all ISSC members for their contributions over the years. He reminded consortia representatives that they must identify their SSEC members by 31 December 2007, and preferably by 21 December 2007.

Close of meeting at 23:10 UTC.

JCG 10Dec2007

Annex A Meeting Agenda

AGENDA FOR ISSC MID-TERM TELECON

27 November 2007
21:00 – 23:00 UTC

Call +31 70 3151200
Access: 350933#
Chair: 583657#

Time	Agenda Item	Lead	Paper	Action
21.00	0. Welcome by Chair	BJB		
21.01	1. Confirmation of representation & quorum	BJB		C
21.03	2. Approval of draft agenda	BJB	2.0	A
21.05	3. Meetings			
	3.1 ISSC 18 minutes (public and private)	BJB	3.1	A
	3.2 XC071105 telecon summary	BJB	3.2	N
21.15	4 Preliminary SKA Specifications	RTS	4.0	D/A
22.00	5. Governance			
	5.1 International Collaboration Agreement and the MoA for the SPDO	BJB	5.1a 5.1b	D/A
	5.2 Supplementary SPDO-JBCA hosting agreement	PJD / RTS		I/N
	5.3 Audit Committee membership	BJB		D/A
	5.4 SKA Forum	BJB	5.4	D/N
22.25	6. PrepSKA update	PJD	6.0	D/A
22.40	7. ISPO Report			
	7.1 IEAC membership and Terms of Reference	RTS	7.1	I/A
	7.2 SPDO and CDIT recruitment	RTS		I
	7.3 Forward Look Budget 2009-11	RTS	7.3	D
	7.4 2008 Budget	RTS	7.4	D/A
23.00	8. AOB			

Purpose

I: For information
D: For discussion

Suggested ISSC Action

C: Confirmation
N: Noting
A: Approval
R: Resolution

Annex B Summary of Actions and Decisions

Action ID	Action	Owner	Status (30 Nov 2007)
071127.1	Send comments about the ISSC 18 minutes to <i>Greenwood</i> . (p3)	<i>Ekers</i>	
071127.2	Qualify statement regarding his reference to a two stage site selection process in Section 10.3. (p3)	<i>Lazio</i>	Completed
071127.3	Organise an email ballot for the ISSC to approve the private and public ISSC 18 minutes. (p4)	<i>Boyle</i>	
071127.4	Email <i>Schilizzi</i> with recommendations for improving the clarity of Tables 1-3. (p5)	<i>Garrett</i>	Completed
071127.5	Make the following changes to the Executive Summary by 2 December 2007: (a) change 'specifications' to 'preliminary specifications', (b) standardise use of, and define, the term 'specifications', (c) state the purpose of the document, (d) identify the target audience, (e) clarify the summary of Tables 1-3, (f) provide a breakdown of Phase 1 costs in the caption of Table 2, (g) increase the length of the section to 2-3 pages. (p5)	<i>Schilizzi</i>	
071127.6	Establish the willingness of the target candidate to Chair the Audit Committee. Make a formal representation to the target candidate, if appropriate. (p6)	<i>Ekers / Boyle</i>	
071127.7	Establish the availability and willingness of target candidates to serve on the Audit Committee. (p6)	<i>Boyle</i>	
071127.8	Investigate whether there is a publicly available 'Open Skies' policy document in the US. (p7)	<i>Terzian</i>	
071127.9	Arrange for the Operations Working Group to develop a more comprehensive 'Open Skies' policy for the SKA. (p7)	<i>Kellermann</i>	
071127.10	Discuss possible candidates for the Production Mass Manufacturing Engineer role. (p8)	<i>Schilizzi / van Ardenne</i>	
071127.11	Organise an email ballot for the ISSC to approve a revised IEAC candidates list, by the end of 2007. (p8)	<i>Boyle</i>	
071127.12	Invite selected candidates to serve on the IEAC in January 2008, with responses to be collated in time for SSEC 1. (p8)	<i>Boyle</i>	
071127.13	Make the following changes to the Budget 2008: (a) change the header from 'contingency' to 'unallocated' and add a note that this money acts to mitigate the effects of any unpaid Common Fund dues, and (b) remove the breakdown of European contributors from the forecast of income. (p9)	<i>Schilizzi</i>	Completed

ID	Decision
071127-1	Approval of the new agenda for the telecon. (p3)
071127-2	Approval of the 'Draft Preliminary Specifications of the SKA' document for public circulation prior to despatch to SSRC members, conditional upon the revisions in AI 071127-5 being made. Reference to the term 'draft' should be removed from the document sent to SSRC members, and version control should be applied. (p5)
071127-3	Approval of the changes suggested by the SKA Forum to the International Collaboration Agreement and the MoA to establish the SPDO. (p6)
071127-4	Approval of the IEAC's Terms of Reference. (p8)
071127-5	Approval of the Budget 2008, conditional upon implementation of the changes listed in AI 071127.13. (p9)