SELECTION OF THE SKA SITE

General Issues

Pasadena, CA
October 2009

YERVANT TERZIAN

SKA PLAN

PHASES 1 and 2: Frequency range
~70 MHz to ~10 GHz

PHASE 1: 10-20% of collecting area
Complete by 2018

PHASE 2: Full collecting area
Complete by 2022

PHASE 3: Higher frequencies
> 10 GHz

REQUIRED GENERAL PHYSICAL CHARACTERISTICS

• Very quiet RFI
• Large physical extent (~3000 km)
• Low ionospheric turbulence
• Low tropospheric turbulence
SITE SHORT LISTING PROCESS

NOV 2001: Invitation to the world
JULY 2002: Several expressions of interest
NOV 2002: Six invited for initial pre-proposals
JUNE 2003: SESC evaluations
SEPT 2004: RFP issued by the ISSC
DEC 2005: Received four proposals (Argentina/Brazil, Australia, China, South Africa)
JAN 2006: Proposal evaluations begin by SEWG
FEB 2006: FAWG asks for ‘short list of acceptable sites’
JULY 2006: External evaluations by ISSAC
AUG 2006: ISSC short list evaluation
SEPT 2006: ISSC reports short list to FAWG

ISSC MAIN SELECTION CRITERIA

2006

• RFI and RQZ
• Array configuration
• Ionospheric conditions
• Tropospheric conditions
• Climate, site infrastructure
• Data transport connectivity

NOTE: Capital and operating costs were not considered, neither were national attributes

ISSC SHORT LISTED CORE SITES

SOUTH AFRICA

AUSTRALIA

Western Australia
PREPSKA WP 3
To Deliver By April 2011 For 2 Sites
SCWG

• Levels of RFI
• RQZ
• Ionosphere and troposphere
• Array configuration
• Physical characteristics issues with design, operations and cost
• Infrastructure costs and timelines
• Long term site sustainability, RFI, etc.

PROPOSED SSEC CRITERIA FOR FINAL SELECTION

• Criteria used for short listing
• Must be capable for SKA Phases 1 and 2 (SKA-HI TBD)
• Capital costs of infrastructure (includes power capabilities)
• Operating costs
• National and local attributes
• Timeline of host site contributions
• Environmental restrictions
• SKA organization and host country
• Interactions
NATIONAL ATTRIBUTES

- Political and economic structure and stability
- Entry visas to all
- Ease of government interactions
- Import/export issues and taxes
- Access to foreign companies
- Land claims
- General support of science and technology
- Academic astronomy population
- Availability of engineers and technical personnel

PHASE 3 SITE

Current SSEC position is that the selected site should be able to accept Phase 3.

- Phase 3 ideas are not well developed, such as cutoff upper frequency.
- The two short listed sites may not be optimal for Phase 3.
- SSEC will soon consider the Phase 3 site issue. What should the US position be?
- Can site decision for Phases 1 and 2 be made before the Phase 3 site process is reconsidered?

AGENCIES SKA GROUP (ASG), JULY 9, 2009
21 GOVT REPS, ONLY 1 FROM US !!!

SITE DECISION (Under discussion)

1) SSEC evaluates based on all criteria, recommends to ASG for final decision
2) SSEC evaluates based on science and engineering, recommends to ASG for final decision
3) SSEC cannot reach recommendation, ASG makes decision on political grounds

POSSIBLE OUTCOMES

1) Winner takes all
3) Win-Win
   SKA-LO in one country
   SKA-MID in the other country
   Most of the SKA in one country
   A mega-station in the other country
   Dishes in one country
   Aperture arrays in the other country
   (Some science duplications ??)

NOTE: Cost duplications ? And issues with all Win-Win models.
INFRASTRUCTURE TIMELINE

ISSUES: After site selection, need environmental analysis and permissions (~2 years). At the same time establish SKA organization, senior staff etc.

Infrastructure development will need 2 years more (power, signal transport).

NOTE: All the above need funding in place.

If site decision is in 2011, then arrays can be deployed in 2015.
Phase 1 completion date: 2018

If site decision is later than 2011
Phase 1 completion ???

GENERAL QUESTIONS

• Can site decision be made before ASG commits funding for Phase 1? (Phase 2?)

• Can site infrastructure work begin before final engineering design?

• How strongly would the site decision depend on host country’s contributions?

• To what degree do South Africa and Australia participate in the selection process? (Vote?)

• Who has a say in the ASG on-site selection? (What weights should the votes have?)

Optimum timeline

Site decision

Late 2011 to early 2012 together with Phase 1 funding decision.