The road to the final SKA site decision

At the SKA Forum 2011 in Banff, the Founding Board of the SKA unveiled the process and timeline for selecting the site that will host the largest radio telescope array in the world.

Since March this year the two candidate sites – South Africa in conjunction with its eight African partner countries (Namibia, Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique and Zambia), and Australia together with New Zealand – have been finalising their respective site proposals in response to a Request for Information (RfI) from the SKA Site Selection Group (SSG). Detailed documentation on all the relevant scientific and technical factors, infrastructure costs, and legal, environmental and security issues, were due on 15 September 2011. South Africa submitted its proposal, consisting of a 150 page summary report and several thousand pages of supporting documentation, before the deadline. Selection factors include levels of radio frequency interference, the long-term sustainability of a radio quiet zone, the physical characteristics of the site, data network connectivity across the vast distances covered by the telescope as well as operating and infrastructure costs.

South African Minister of Science and Technology, Naledi Pandor, addresses a press conference at the SKA Forum 2011

"I wish to emphasise the critical urgency of taking this project beyond conception to practical action," urged the South African Minister of Science and Technology, Naledi Pandor, at the SKA Forum 2011, held in Banff, Canada during July 2011. "We are keen to move into the design and implementation phase," she declared.

These submissions will be thoroughly scrutinised and evaluated by panels of experts and the independent SKA Site Advisory Committee (SSAC) until November 2011.

By the end of this year the SSAC, an external body of independent experts, will evaluate the findings and recommend a preferred site. They will present their final reports to the SKA Board of Directors, which is due to make its final site decision in February 2012.

More industry contracts for SKA South Africa

The SKA South Africa project has awarded four significant contracts for its KAT-7 and MeerKAT projects:

1. **EMSS** (Electromagnetic Software and Systems, Stellenbosch) were awarded a contract to develop, produce and qualify the L-band receivers for MeerKAT Phase 1. "These receivers are essentially small hi-fidelity antennas that operate at minus 200°C and colder, inside a vacuum vessel where the pressure goes down to 0.000 000 001 bar and lower," explains LJ du Toit of EMSS. "It is quite a challenge to get the sensitive electronics in all the antennas working together under these conditions".
2. **MMS**, a Centurion-based engineering company, has been awarded a contract to analyse the MeerKAT antennas structurally – working closely with the electromagnetic modelling experts at EMSS in order to optimise the mechanical structure and scientific performance of the antenna simultaneously. An important part of their contract is a curing distortion study to verify that the composite dishes will not distort on the mould during production. Scale model casts, 3 – 4 m in diameter, will be prepared to qualify the model. They are also assessing whether the reflectors for MeerKAT should be made of carbon fibre or fibreglass, and doing a mould design for the offset MeerKAT reflectors. Surface accuracy of both reflector elements has to conform to very tight tolerances because of the requirements of the Gregorian offset antenna.
3. The **CSIR** has been tasked with qualifying the composite materials used for reflector elements to ensure that these can withstand 30 years of service. This work package will consider structural creep, UV resistance, fungal growth, hail damage, thermal fatigue, and verifying structural properties of the material and bonding interfaces. An on-site wind study has been conducted to evaluate the predicted wind forces on the antennas, which is important for pointing stability and protecting the antennas.

4. Two contracts were awarded to **BAE Systems Dynamics (SA)**. The first of these was for the development of an elevation load measure system for KAT-7 to analyse the loading on the most critical (single point of failure) component of the antenna in order to provide design data and qualify the leadscrew design for the MeerKAT antennas. The second comprises offset antenna concept analyses to complete the preliminary work required to finalise specifications for the MeerKAT antennas.

E-mail: marina@southernscience.co.za to subscribe to this newsletter of the SKA South Africa Project.

SKA South Africa Project Office
Street address: 17 Baker St, Rosebank, Johannesburg, South Africa
Postal address: PO Box 522940, Saxonwold, 2132
Tel: +27 (0)11 442 2434

The MeerKAT Engineering Office
Postal/Street address: SKA SA, 3rd Floor, The Park, Park Road, Pinelands, 7405, South Africa
Tel: +27 (0)21 506 7300

Directions at: http://www.ska.ac.za/contactus/index.php