

# SKA-Mid Product Assurance

Overview of the SKA PQAP and how it applies to the SKA-MID products

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11 May 2022





# Pre-Contract Award PA Activities – Plan for PA

## SKA Project

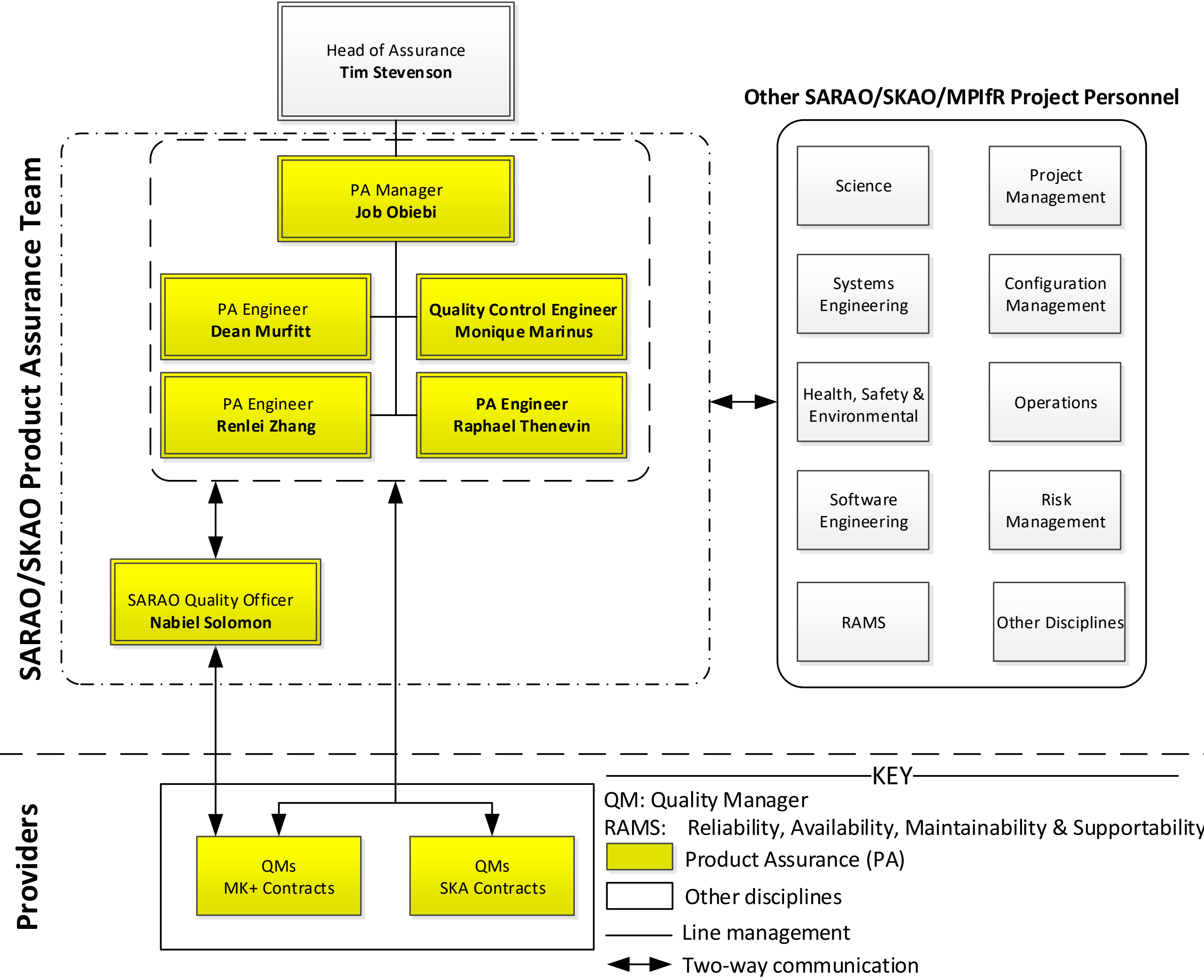
- “SKA Product Quality Assurance Plan”, SKA-TEL-SKO-0000739 – Rev 03
- The content of the PQAP includes:
  - Quality policy
  - Quality objectives
  - Roles and responsibilities
  - Processes and associated requirements
- “SKA Software Product Quality Assurance Plan”, SKA-TEL-SKO-0001772 - Rev 01
  - Written in response to the SKA PQAP plan

## MeerKAT Extension Project

- “MeerKAT Extension Product Assurance Plan”, SSA4003-0007-007 – Rev 1
- The content of the PA plan which has the SKA PQAP as an applicable document includes:
  - Quality objectives
  - Roles and responsibilities
  - Processes and associated requirements



# Pre-Contract Award PA Activities – PA Team Organisation



- Apart from the SKA software contracts, each of the SKAO PA team members are organised to lead the PA activities of the different contracts.
- Details of team members allocation to different contracts including SKA-Mid's can be found here: <https://confluence.skatelescope.org/display/PA/Team+Members+Tasks>
- For the MK Extension project, PA the team members are allocated as follows:
  - SPF Band 2 & Services – Monique Marinus
  - Dish Structure – Renlei Zhang
  - Infrastructure – Nabel Solomon (SRAO)
  - Helium – Renlei Zhang (contract yet to start)
- For SKA software products, the PA team:
  - Does not directly lead the PA activities of the different software contracts as this is the responsibility of the software team
  - Provides oversight of the activities of the provider, the SKA software team through participation at PIs and Demo events



# Pre-Contract Award PA Activities – Process Areas and Requirements

- The SKA PQAP includes the following process areas with associated requirements for SKAO (Section 3 of the PQAP) and those that the providers will comply with (Section 4 of the PQAP)
  - Critical Items Control / Early Warnings
  - Nonconformance/Defect Control
  - Traceability
  - Reviews
  - Mandatory Inspection Points
  - Configuration Management
  - Risk Management
  - Procurement
  - Design, Manufacturing and Verification
  - Testing
  - Quality Monitoring and Measurement
  - PQA Reporting
  - Contractor Surveillance
  - Acceptance and Delivery
  - Learning from Experience and Continuous Improvement

Note: Depending on the type and stage of the contract, it is not expected that all the process areas will be implemented by the provider



# Pre-Contract Award PA Activities – Readiness for Contract Award and Contract Execution

- Tender preparation and evaluation support
  - Support the translation of the quality requirements in PQAP into the Scope documents – unless the PQAP is directly referenced in the Scopes
  - Specifically, review each of the Scope documents to verify that the product and service requirements including their associated deliverables are well defined in the respective Scopes
  - Support the development of, specifically quality related questions in PQQ and ITT tender documents
  - Review and score tenderers
  - Advise the tender panel on the overall quality of the returns of tenderers, including Quality Plans when provided as part of tender returns
- Critical items identification
  - Identify and record critical items that will be provided to some of the providers to consider and incorporate into their critical item registers
- Produce PA templates - to support the following activities during the execution of the different contracts
  - First Article Inspection (FAI) and FAI Report (FAIR)
  - Functional Configuration Audit (FCA)
  - Physical Configuration Audit (PCA)
  - Quality Plan template – for those providers that need our support with the production of their quality plans



# Post-Contract Award PA Activities – Acceptance of Providers' Plans

- Review providers' Quality Policy statements and Quality plans to enable the Project/Service/Supply Managers to accept them
- Contribute to the review of other plans that include the following before their acceptance
  - Manufacturing plans
  - Verification plans
  - Inspection and Test plans
- Agree PA activities with providers
  - Establish contact with our PA counterparts on the side of the providers to agree how both parties will work together to support the implementation of their quality plans and monitor these during the execution of their contracts
  - Frequency of PA meetings and agenda items
  - Schedule of PA activities
  - Etc.





# Post-Contract Award PA Activities – MIPs and Critical Items Management

- SKAO PA team to arrange for an early meeting with the providers' PA representative to discuss and agree the critical items and MIPs that are relevant to their contracts
- Invite relevant disciplines from both the SKAO and the providers to such meetings
- Both parties present their critical items and those that are agreed as critical items should be in the providers critical items or risk registers
- Both parties agree on the control measures for each critical items and the timing of their implementation



# Post-Contract Award PA Activities – Audits of Providers

- Carry out audits at the earliest opportunity, especially before any main activity starts, e.g. manufacturing
  - Note: Where necessary, audits can still be conducted prior to contract award
- Audit planning
  - Pre-auditing meeting
    - Send audit self-assessment questionnaire few weeks before the day of the audit meeting
  - Audit meeting
    - A day or more at providers facility
    - Participants include the auditees, auditors; with the project/service/supply manager as an observer
- Initial feedback of findings to auditees at the end of the audit meeting
- Post audit
  - Within a week, audit reports will be shared with the auditees, relevant stakeholders and also provided at relevant main reviews as defined in the Scopes

Product Assurance (PA) Audit of <contractor name>						Manufacturing Activities				<a href="#">Return to summary sheet</a>	
SKAO						ID	Activities	Explanatory Notes	Describe evidence of compliance	provided (Yes, No, N/A)	Comments
These self-assessment questions will be used to support the PA audit of <contractor name> for the <contract name> contract of the SKA Project. An audit report will be produced following the clarification of the contractor's response to the assessment questions and onsite audit.						M19	Are there records kept for all the manufacturing equipment		Records such as Calibration certificates and verification results for equipment are retained in the equipment inventory.	Yes	Records available to view on request.  <i>Action: Arrangements will be made during the industrialisation stage to view this.</i>
Contract Name: _____						M20	Does the contractor ensure that computer-aided techniques and data for processing and machining are validated prior to use and controlled during their use in manufacturing?		Yes. Files are under configuration management.	Yes	
Project Phase: _____						M21	Does the contractor ensure that provisions are made for the testing, approval and configuration control of the computed aided manufacturing software involved and the prevention of unauthorised alteration or reconfiguration?		Yes. Files are under configuration management.	Yes	
PA Assessment Questionnaire Issue Date: _____						M22	Does the contractor have established and documented controls for particulate and molecular cleanliness, and documented and validated process for cleaning where necessary, of the manufactured products, and the limitation of sources of contamination?			N/A	Not applicable
Summary of Actions following Assessment: Input to site audit and subsequent Audit Report.						M23	Does the contractor ensure that the required cleanliness levels for the product are indicated on drawings, specifications, procedures, or other documents controlling the manufacture, assembly, integration and test of the items?	<i>Where cleanliness is critical.</i>	Handling and cleaning requirements where applicable are specified in assembly procedures. Cleanliness level for mechanical parts is indicated on drawings.	Yes	
Next PA Assessment due: _____											
PA Assessor and Audit Team: PA team members and Domain experts*											
* Domain expert on parts, materials, processes, etc.											
Need Help? <a href="#">Click Here</a>						PA Status					
						Total Entries	Blank Cells	Yes	No	N/A	
<a href="#">PA Management</a>						13	13	0	0	0	
<a href="#">Critical Items</a>						7	7	0	0	0	
Nonconformance Control						5	5	0	0	0	
Traceability						6	0	1	4	1	
Reviews						5	5	0	0	0	
Config. Management						4	4	0	0	0	
Risk Management						4	4	0	0	0	
Surveillance						6	6	0	0	0	
Receiving Inspection						4	4	0	0	0	
Design						13	13	0	0	0	
Manufacturing						23	23	0	0	0	
Verification						5	5	0	0	0	





# Post-Contract Award PA Activities – Surveillances, FAI, FCA and PCA

- The PA team (with support from other disciplines as required) will carry out regular surveillance of the providers and their external providers (where necessary)
  - Regular visits to review providers' procurement documents, include records of their surveillances
  - Ad hoc meetings to discuss problems and opportunities
  - MIPs
    - Surveillance reports will be produced with findings and recommendations
- Work with providers to produce First Article Inspection (FAI), Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) on the first item in a pre-production batch before any mass production
  - FAI, FCA and PCA reports for PRR (or as relevantly defined in the Scope)
- Work with providers to produce PCA at completion
  - PCA report at completion



# Post-Contract Award PA Activities – Quality Performance Measurements, Improvements and Reporting

- Use Quality Performance Indicator (QPI) to monitor providers performance at relevant stages of the contract to show that the provider's performance against the process areas
  - QPI reports
- Capture quality related lessons learnt and share with the providers and the SKA project team at relevant stages of the contract
  - Lesson learnt Register
- PA updates at contract meetings





# Post-Contract Award PA Activities – Evaluation of the SKA-Mid Products against the SKA Quality Objectives

- At major milestones for each of the SKA-Mid contracts, the PA team will capture and report on the progress of the contracts against the SKA Quality Objectives as defined in the SKA PQAP
  - There are 11 quality objectives in Section 3.1 of the SKA PQAP

## Progress against the Quality Objectives at Y? Decision Gate

### Decision Gate Assessment (DGA) Status Description:







DGA Status	DGA Status Description
	Objective not assessed because not relevant at this Decision Gate
	Objective is not achieved
	Objective is not yet achieved but being addressed and on target to be achieved
	Objective is achieved

Table 7. Progress against the Project Quality Objectives for XY? Contract

S/N	Quality Objective	DGA	Evidence	Comments
1	To ensure each item of the product that is designed, manufactured, tested and delivered meets the SKA project requirements (functional and non-functional requirements)			
2	To ensure inclusion of reliability criteria in the design of the SKA			
3	To identify and integrate quality engineering into manufacture and test so that the inherent design reliability is not compromised or degraded			



# Post-Contract Award PA Activities – Support for the Evaluation of the Extended MeerKAT for Integration into SKA-Mid

- From the “MeerKAT Extension Product Assurance Plan”, SSA4003-0007-007, the PA activity will
  - “ a) Verify whether the SKA products that are industrialised and produced as part of this project meet the SKA safety, performance and reliability requirements over the lifetime of the product.
  - “ b) Ensure that the SKA Observatory is in a position to accurately evaluate the SKA products for future accreditation and incorporation into the SKA system.”
- A final PA report detailing the extent to which the products meet the quality objectives will be produced to enable the evaluation and transfer these products to SKA-Mid
  - Band 2 & services contract – progress against quality objectives at Acceptance Review can be found here <https://drive.google.com/drive/folders/1Z0DVa806bTfWGOQA0BU1TUMoVryvFUFA>
  - Dish structure contract – the progress against quality objectives at IRR is being finalised
  - Infrastructure contract – the progress against quality objectives is being collated and will be presented at completion
  - Same will be done for Helium contract





# Further Information

Further information can be found at the PA site,  
<https://confluence.skatelescope.org/display/PA/Product+Assurance>

**Product Assurance**  
Created by Stevenson, Tim, last modified by Obiebi, Job on Apr 25, 2022, viewed 757 times

### Purpose

The prime objective of Product Assurance (PA) is to ensure that SKA products accomplish their defined mission objectives in a safe, available and reliable way. Commitment to quality across the entire SKAO is key to achieving and sustaining Telescope quality and the success of its science programmes. The management of PA should be fully embedded in the management of the project and should receive the highest priority from SKAO management. The early identification of aspects potentially detrimental for safety and project success, and the cost-effective prevention of any adverse consequence of such aspects are basic principles for Product Assurance requirements.

This Confluence Space for Product Assurance shall provide an overview of the work logic and data flow required, such that PA activities may be applied across:

- Product Quality Assurance (QA)
- Manufacturing Sustainability
- Electrical, electronic, electromechanical (EEE) components
- Materials, mechanical parts and processes
- Consumables and maintainable components
- Product Safety, and Safety Management

### PA Space Custodians

Name	Organisation	Role
@Stevenson, Tim	SKAO	Project Lead
@Obiebi, Job	SKAO	PA Manager
@Murfitt, Dean	SKAO	PA Engineer
@Marius, Monique	SKAO	QC Engineer
@Thenevin, Raphael	SKAO	PA Engineer
@Zhang, Renlei	SKAO	PA Engineer
@Solomon, Mogamat Nabel	SARAO	QA Officer

"Where do I start? How do I use this Confluence Space?"

### PA Space Structure

- ▼ PA Team
  - ▶ Team
    - Team Members Tasks
- ▼ Quality Plans
  - Stages of Key PQA Activities
  - SKA PQA Plans
  - Contractors' Quality Plans
- ▼ Procedures

### Recently Updated Pages

- Lesson-Learned-2022-03-02  
yesterday at 4:44 PM • updated by Thenevin, Raphael • view change
- Antenna AA\*+ Contract  
yesterday at 4:01 PM • created by Thenevin, Raphael
- Antenna AA0.5 Contract  
yesterday at 4:01 PM • updated by Thenevin, Raphael • view change
- SKAO Project  
yesterday at 2:57 PM • updated by Murfitt, Dean • view change
- Minutes of Meeting-MK+  
May 03, 2022 • updated by Obiebi, Job • view change
- Product Assurance



Thank you

*We recognise and acknowledge the  
Indigenous peoples and cultures that have  
traditionally lived on the lands on which  
our facilities are located.*

**SKAO**

[www.skao.int](http://www.skao.int)