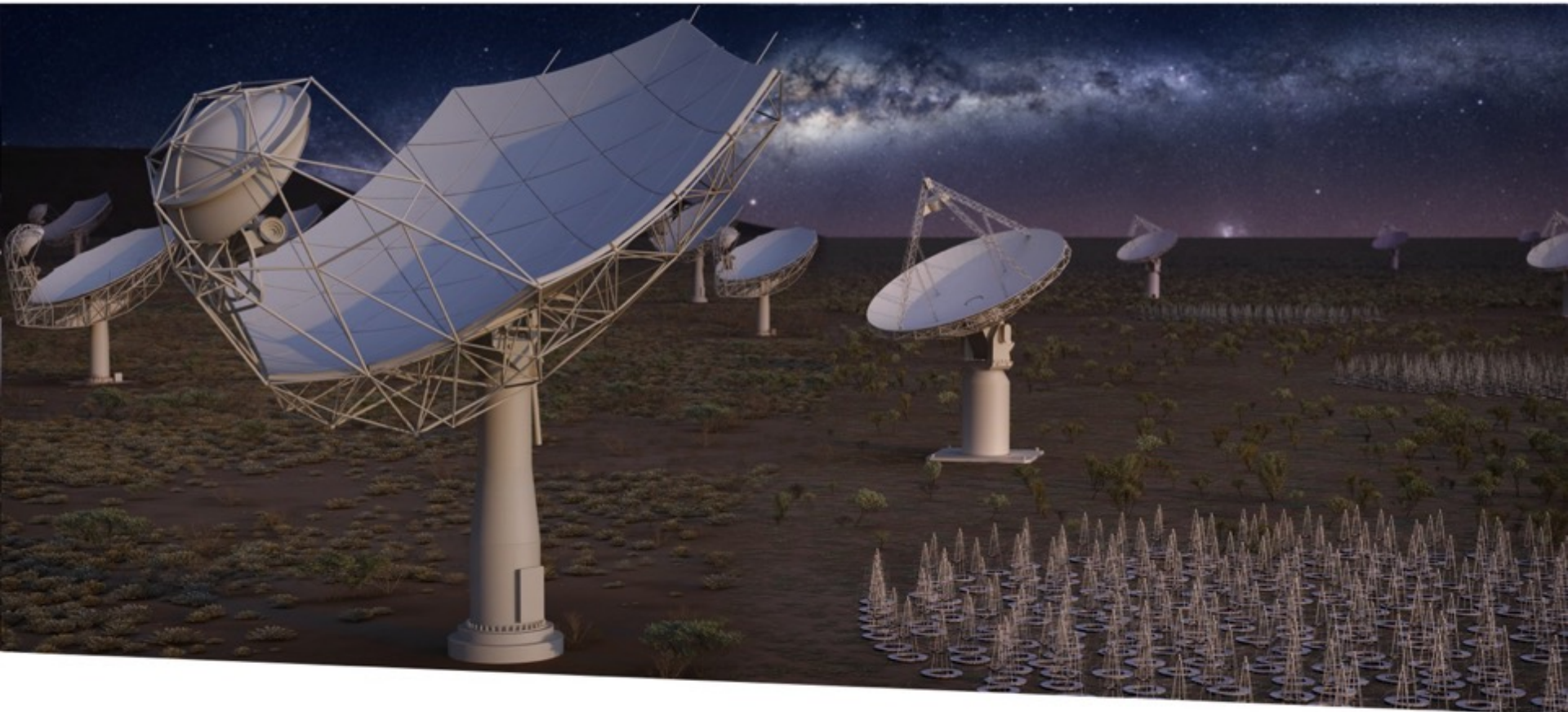


Square Kilometre Array: Current status



SQUARE KILOMETRE ARRAY

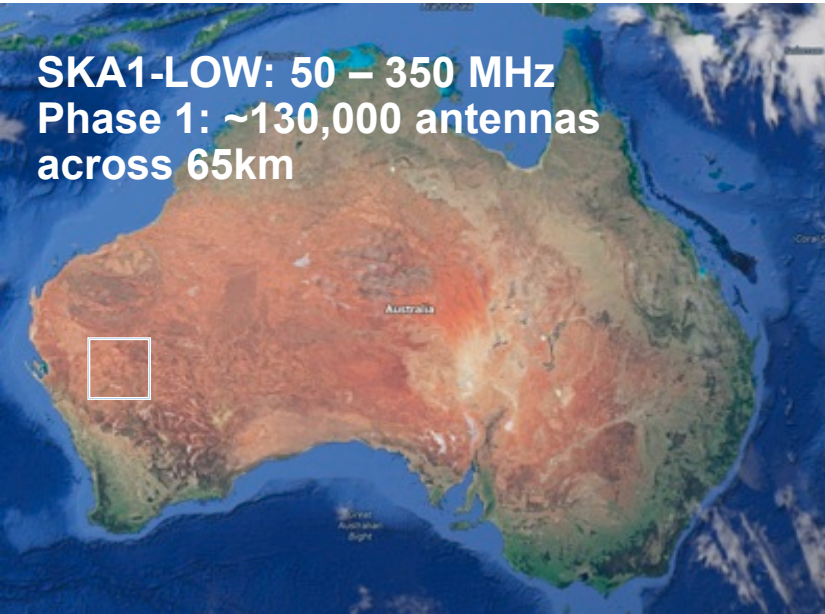
Simon Berry, SKAO

Exploring the Universe with the world's largest radio telescope AENEAS All Hands Meeting: 11th November 2019

SKA: HQ in UK; telescopes in AUS & RSA



SKA1-LOW: 50 – 350 MHz
Phase 1: ~130,000 antennas
across 65km



SKA1-Mid: 350 MHz – 24 GHz
Phase 1: 200 15-m dishes across
150 km



SKA: A global Research Infrastructure



Potential Future Members



+.....



Members of the SKA Organisation
Host Countries: Australia, South Africa, United Kingdom



African Partner Countries

SKA Observatory will be established as an Intergovernmental Organisation in 2020, taking over from the SKA Organisation. It will undertake the construction and operation of the telescope.

As of March 2019, confirmed SKA Observatory members are



Convention signing – 12th March



Treaty signing: Rome, 12 March 2019

19 August: NL ratified

9 October: key ZA parliamentary cmte approves;
Ratification expected Nov/Dec

14 October: AU Joint Standing Committee On Treaties
discussing.

Progressing well in other countries also



Similar to ESO, CERN, ITER, ESA.....

Status of design activities

System CDR

Events

- 13 September 2019:
 - Internal publication of CDR documentation
- 21 October 2019:
 - Publication of CDR documentation
 - Kick-off teleconference
- 18 November 2019:
 - OAR status update/finalisation of agenda
- 09-12 December 2019:
 - CDR Meeting
- March 2020: Target CDR closeout



SYSTEM CDR PLAN AND PROCEDURE	
Document number	SKA-TEL-SKO-0001022
Document Type	PLN
Revision	01
Author	L Stringhetti
Date	2019-03-15
Document Classification	FOR PROJECT USE ONLY
Status	Released

Name	Designation	Affiliation	Signature	
Authored by:				
L. Stringhetti	Project Engineer	SKAO	<i>L. Stringhetti</i>	
			Date:	2019-03-16
Owned by:				
L. Stringhetti	Project Engineer	SKAO	<i>L. Stringhetti</i>	
			Date:	2019-03-16
Approved by:				
Andrea Casson	Head of Project Management	SKAO	<i>Andrea Casson</i>	
			Date:	2019-03-16
Tim Stevenson	Head of Mission Assurance	SKAO	<i>T. Stevenson</i>	
			Date:	2019-03-18
Released by:				
Joe McMullin	Programme Director	SKAO	<i>J P McMullin</i>	
			Date:	2019-03-18

Review Panel composition



Review Panel			
Adrian Russell	ESO	Review Panel Chair	arussell@eso.org
L. Stringhetti	SKAO	Panel Secretary SKAO Project Engineer	L.Stringhetti@skatelescope.org
Chuck Gessner	LSST	Project Management	cgressner@lsst.org
Alison Peck	Gemini Telescope	Project Management	apeck@gemini.edu
Jeff Kantor	LSST	Design	JKantor@lsst.org
Gie Han Tan	ESO	Design	ghtan@eso.org
Heather Marshall	NSO	Design	hmarshall@nso.edu
Jaap Baars	Consultant	Design	jacobbaars@arcor.de
Larry D'Addario	Caltech	Design	ldaddario@caltech.edu
David DeBoer	Berkeley	Design	ddeboer@berkeley.edu
James Fanson	GMT	Project Management	jfanson@gmto.org
Rafael Hiriart	NRAO	Design	rhiriart@nrao.edu

Document Tree (from: CDR reading guide)



Level 0 Reqs : Not under Review
 SKA-TEL-SKO-000007 SKA1_Level0 Science Requirements
 SKA-TEL-SKO-000037 SKA1 Operational Concept Document

KEY Common Documents
 SKA-TEL-SKO-0001022 SKA1 System Design Reading Guide
 SKA-TEL-SKO-0001069 SKA1 System Adoption Review Report

Key Document: Design

(Level 1 Reqs):
 SKA-TEL-SKO-0000008-Rev11_SKA1SystemRequirementSpecification (1).pdf
 SKA-TEL-SKO-0000008-Rev12_(DRAFT) SKA1 System Requirement document
 SKA-TEL-SKO-0000496 SKA1 Specification tree

(Compliance)
 SKA-TEL-SKO-0001020 SKA1 Compliance Matrix Report
 SKA-TEL-SKO-0000982 SKA1 MID EMI/EMC compliance report (TBC)
 SKA-TEL-SKO-0000983 SKA1 LOW EMI/EMC compliance report (TBC)
 SKA-TEL-SKO-0001059 SKA1 Design Safety Compliance Report

(Design documents)
 SKA-TEL-SKO-0000038 System Baseline Design
 SKA-TEL-SKO-0000793 Signal Chain for the LOW telescope
 SKA-TEL-SKO-0000793 Signal Chain for the MID telescope

(Calibration)
 SKA-TEL-SKO-0001640 SKA1 Calibration plan
 SKA-TEL-SKO-0001088 Report on the Station Calibration Task (AAVS1.5 Phase1)

Key Document: Project

- SKA-TEL-SKO-0001100 SKA1 Project Execution Plan
- SKA-TEL-SKO-0001101 SKA1 WBS Dictionary
- SKA-TEL-SKO-0001103 SKA1 Integrated Project Schedule
- SKA-TEL-SKO-0001102 SKA1 Project Management Baseline Cost Book
- SKA-TEL-SKO-0001150 SKA1 Project Safety Management Plan
- SKA-TEL-SKO-0001201 SKA1 Engineering Management Plan
- SKA-TEL-SKO-0001300 SKA1 Project Management Control System
- SKA-TEL-SKO-0001090 SKA1 MID and LOW Verification flow block diagrams
- SKA-TEL-SKO-0001031 SKA1 EMI/EMC Management Plan
- SKA-TEL-SKO-0001305 Science Commissioning Plan
- SKA-TEL-SKO-0001104 Construction Risk Register

32 Tier 1 Documents under review

INFORM

Document For Reference

SKA1 Budgets

SKA System Budgets
 SKA-TEL-SKO-0000035
 SKA-TEL-SKO-0000102

LOW System Budgets
 SKA-TEL-SKO-0000634
 SKA-TEL-SKO-0000635
 SKA-TEL-SKO-0000823
 SKA-TEL-SKO-0000949
 SKA-TEL-SKO-0001038

MID System Budgets
 SKA-TEL-SKO-0000629
 SKA-TEL-SKO-0000630
 SKA-TEL-SKO-0000633
 SKA-TEL-SKO-0000950
 SKA-TEL-SKO-0000977
 SKA-TEL-SKO-0001038

LOW Product Interfaces

100-000000-002
 100-000000-003
 100-000000-004
 100-000000-020
 100-000000-021
 100-000000-022
 100-000000-023
 100-000000-024
 100-000000-025
 100-000000-026
 100-000000-028
 100-000000-029
 100-000000-032

MID Product Interfaces

300-000000-002
 300-000000-002
 300-000000-021
 300-000000-022
 300-000000-023
 300-000000-024
 300-000000-025
 300-000000-026
 300-000000-027
 300-000000-029
 300-000000-032
 SKA-TEL-AIV-2310001
 SKA-TEL-AIV-2310002
 SKA-TEL-AIV-2310003
 SKA-TEL-AIV-2310004
 SKA-TEL-AIV-2310005
 SKA-TEL-SKO-0000115
 SKA-TEL-SKO-0000116
 SKA-TEL-SKO-0000124
 SKA-TEL-SKO-0000150
 SKA-TEL-TM-0000201
 SKA-TEL-SKO-0000048
 SKA-TEL-SKO-0000151

Block Diagrams

100-00000-010
 300-00000-010
 SKA-TEL-SKO-00001017
 SKA-TEL-SKO-00001018
 SKA-TEL-SKO-00001019
 SKA-TEL-SKO-00001035
 SKA-TEL-SKO-00001036
 SKA-TEL-SKO-00001077
 SKA-TEL-SKO-00001076
 SKA-TEL-SKO-00001090

Element Executive summaries

SKA-TEL-SKO-00001029
 SKA-TEL-SKO-00001030
 SKA-TEL-SKO-00001070
 SKA-TEL-SKO-00001079
 SKA-TEL-SKO-00001080
 SKA-TEL-SKO-00001082
 SKA-TEL-SKO-00001085
 SKA-TEL-SKO-00001086
 SKA-TEL-SKO-00001087
 SKA-TEL-SKO-00001091

Engineering Analysis

SKA-TEL-SKO-0000792
 SKA-TEL-SKO-0000794
 SKA-TEL-SKO-00001037
 SKA-TEL-SKO-00001038

AIV plans and procedures

SKA-TEL-AIV-1420003
 SKA-TEL-AIV-2410001
 SKA-TEL-AIV-2430001
 SKA-TEL-AIV-4410001
 SKA-TEL-AIV-4430001
 SKA-TEL-SKO-0000857

Organizational Standards

SKA-TEL-SKO-0000202
 SKA-TEL-SKO-0000293
 SKA-TEL-SKO-0000661
 [...]

Other Plans

SKA-TEL-SKO-0001305

85 Tier 2 Documents for reference

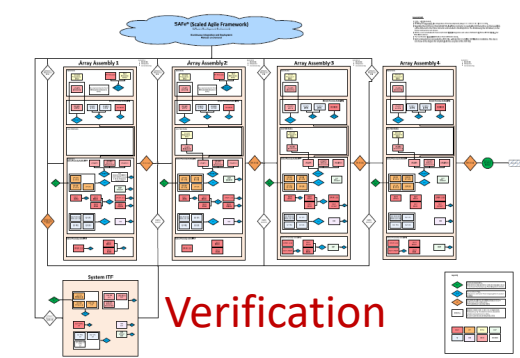
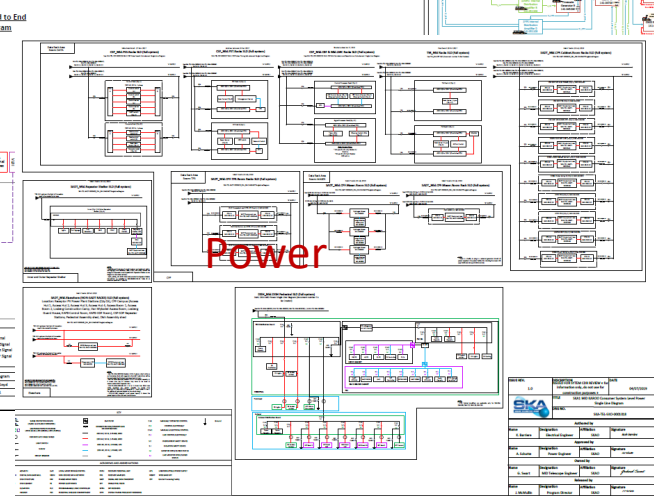
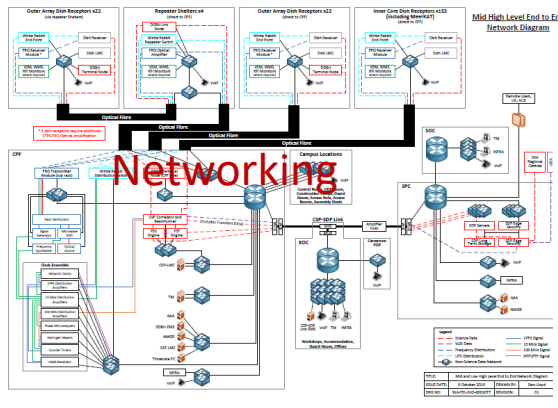
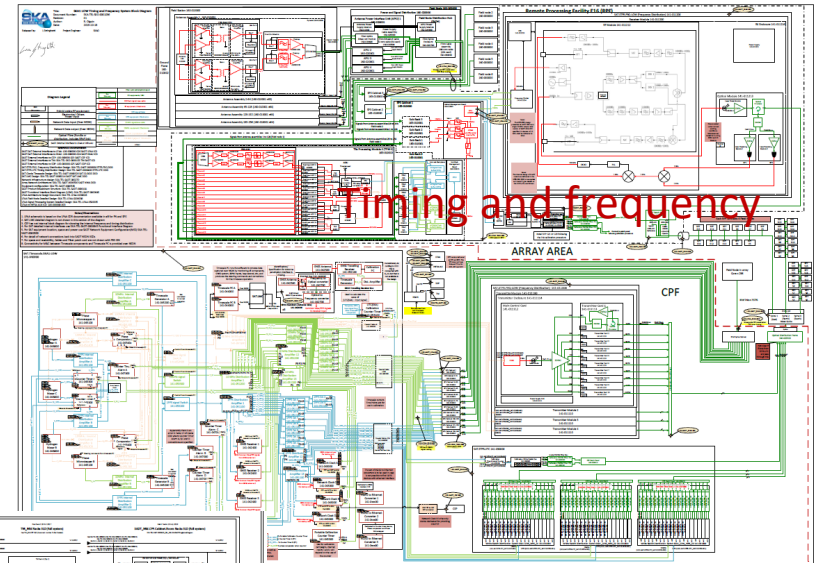
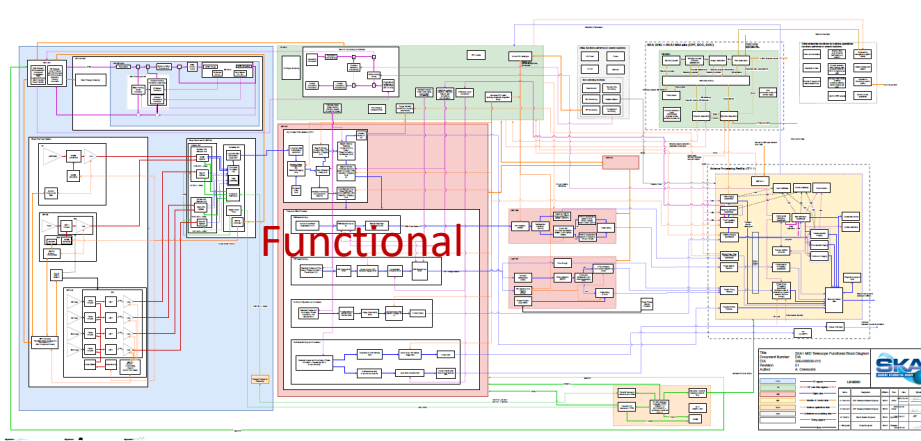
SUPPORT

Document For Reference



~2200 Documents for design baseline

Examples of System Artefacts



Many more....



Risks for Project Office
Risk ID & Title: PO-100 - SKA Kit Contributions Are Not Compatible With Technical Quality Of Programme Requirements

Risk ID & Title: PO-100 - Uncertainty in Cost Estimate

Risk ID & Title: PO-179 - Loss of SKA3 Programme Staff

Risk ID & Title: PO-179 - Loss of SKA3 Programme Staff

SKA PROJECT EXECUTIVE PLAN

Document Number: SKA-TEL-040-0002029
 Document Type: PJA
 Author: JOSEPH MARRAS
 Date: 2008-10-03
 Document Classification: FOR PROJECT USE ONLY

Name	Designation	Affiliation	Signature
Joseph MARRAS	SKA Programme Director	SKA	[Signature]
Joseph MARRAS	SKA Programme Director	SKA	[Signature]
Paul Thompson	Director General	SKA	[Signature]
Joseph MARRAS	SKA Programme Director	SKA	[Signature]

SKA Cost Book

page 1 of 889

01.01.01 - Programme Director Office
 01.01.02.01 - Project Management, Safety and Assurance
 01.01.02.02 - Project Control
 01.01.02.03 - Project Safety
 01.01.02.04 - Product Assurance Oversight and System Support
 01.01.03 - System Engineering
 01.01.04 - Project Engineering
 01.01.05.01 - SKA Software Solution Level Implementation
 01.01.05.02 - SKA Software Content Development and Implementation
 01.01.05.03 - SKA Software System Train and Services Implementation
 01.01.05.04 - SKA Software Australian Local Deployment Support and Training
 01.01.05.05 - SKA Software South African Local Deployment Support and Training
 01.01.05.06 - SKA Software UK Local Deployment Support and Training
 01.01.05.07 - SKA Software Implementation, Co-ordination and Support
 01.01.06 - Construction Consultancy
 01.01.08 - Configuration Management
 01.02.01.01 - MID Infrastructure Activity Management
 01.02.01.02.01 - Adaption of South African Hosting Agreement Assets
 01.02.01.02.02.01 - MID Buildings Delivery
 01.02.01.02.02.02 - MID Temporary Accommodation Delivery
 01.02.01.02.03 - MID Communications Delivery
 01.02.01.02.04 - MID Site Surveys Delivery
 01.02.01.02.05.01 - MID Weather, Visual & STI Monitoring Stations Delivery
 01.02.01.02.05.02 - MID RFI Monitoring Stations Delivery
 01.02.01.02.07.01 - MID Network Delivery: DCSH
 01.02.01.02.07.02 - MID Network Delivery: NCDN for MeerKAT
 01.02.01.02.07.03 - MID Network Delivery: NCDN without MeerKAT Dishes
 01.02.01.02.07.04 - MID Network Delivery: CSP
 01.02.01.02.07.05 - MID Power & Fibre Reticulation Networks Delivery
 01.02.01.02.07.06 - MID Access Delivery
 01.02.01.02.07.07 - MID Antenna Foundations Delivery
 01.02.01.02.07.08 - MID Network Activity Management
 01.02.01.02.08.01 - MID Site Power Facility & Station unit Delivery
 01.02.01.02.08.02 - MID ESPCM Karoo Substation Delivery
 01.02.01.02.08.03 - MID RFI Shielding & PU Power Delivery
 01.02.01.02.10 - MID Building Management System Delivery
 01.02.01.02.11 - MID Security Delivery
 01.02.01.02.13 - MID KAPB Fibre
 01.02.02.01 - MID Array Dish Activity Management
 01.02.02.02.01 - Dish Structure Delivery
 01.02.02.02.02 - Band 0 SP5 Delivery
 01.02.02.02.03 - Band 0 SP6 Delivery
 01.02.02.02.04 - Band 0 SP7 Delivery
 01.02.02.02.05 - Vacuum System Delivery
 01.02.02.02.06 - Cryo System Delivery
 01.02.02.02.07 - Dish Receiver/Digitizer-MD Delivery
 01.02.02.02.08 - Dish Local Monitor and Control Delivery
 01.02.02.02.09 - Dish Optical Fibre Network Delivery
 01.02.02.02.10 - Single Feed Feed Controller Delivery
 01.02.02.02.12 - Dish Receiver/Digitizer-MeerKAT Delivery
 01.02.02.03.01 - MeerKAT Dish Activity Management
 01.02.02.03.02 - MeerKAT Dish Training
 01.02.02.03.03 - MeerKAT Receptor Handover
 01.02.02.03.04 - MeerKAT Dish Integration Execution
 01.02.03.01 - MID Synchronisation & Timing Clocks Activity Management
 01.02.03.02 - MID Synchronisation & Timing Clocks Delivery
 01.02.03.03 - MID Synchronisation and Timing Timing Activity Management
 01.02.03.04.01 - MID Frequency Distribution System

Organisation WBS and cost book

Risk Management

SKA ENGINEERING MANAGEMENT PLAN

Document Number: SKA-TEL-040-0002029
 Document Type: PJA
 Author: M. Carron, M. Bartolini, F. Green, N. Dow, L. Stringfield
 Date: 2008-10-03
 Document Classification: FOR PROJECT USE ONLY

Name	Designation	Affiliation	Signature
M. Carron	Senior System Engineer	SKA	[Signature]
L. Stringfield	Project Engineer	SKA	[Signature]
M. Carron	Head of Project Management	SKA	[Signature]
L. MARRAS	Programme Director	SKA	[Signature]
C. Stansbury	Head of Mission Architecture	SKA	[Signature]
N. Dow	Head of Computing and Software	SKA	[Signature]
L. MARRAS	Programme Director	SKA	[Signature]

Schedule

Dish Structure update

- Antenna handover to MPI.
- Pointing measurements underway.
- Preliminary photogrammetry completed
- Elevation Drive redesign in progress and pole jack will be replaced with a rack and pinion drive

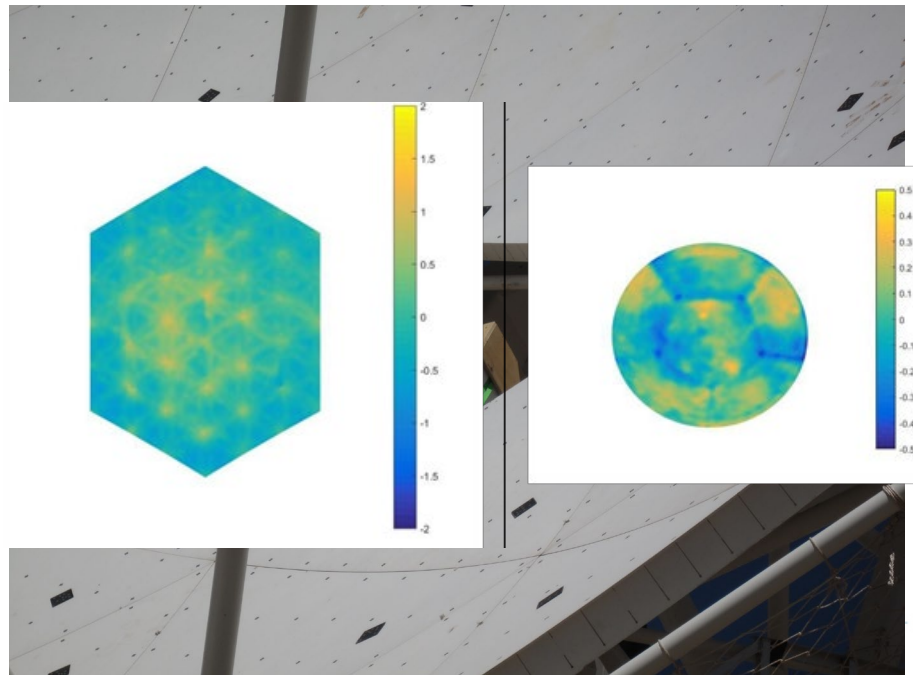


Photo: Enrico Sacchetti

Low Station calibration



AAVS 2.0 deployment, completed

- Power and Signal Distribution week Nov 4th
- 2 new servers deployed for MCCS system and data recording
- Data from full station SKALA4.1
- expected before Dec. 1st

Checking the LNA on top of the antenna. Note the SMART box



SKA1 Design Baseline Cost



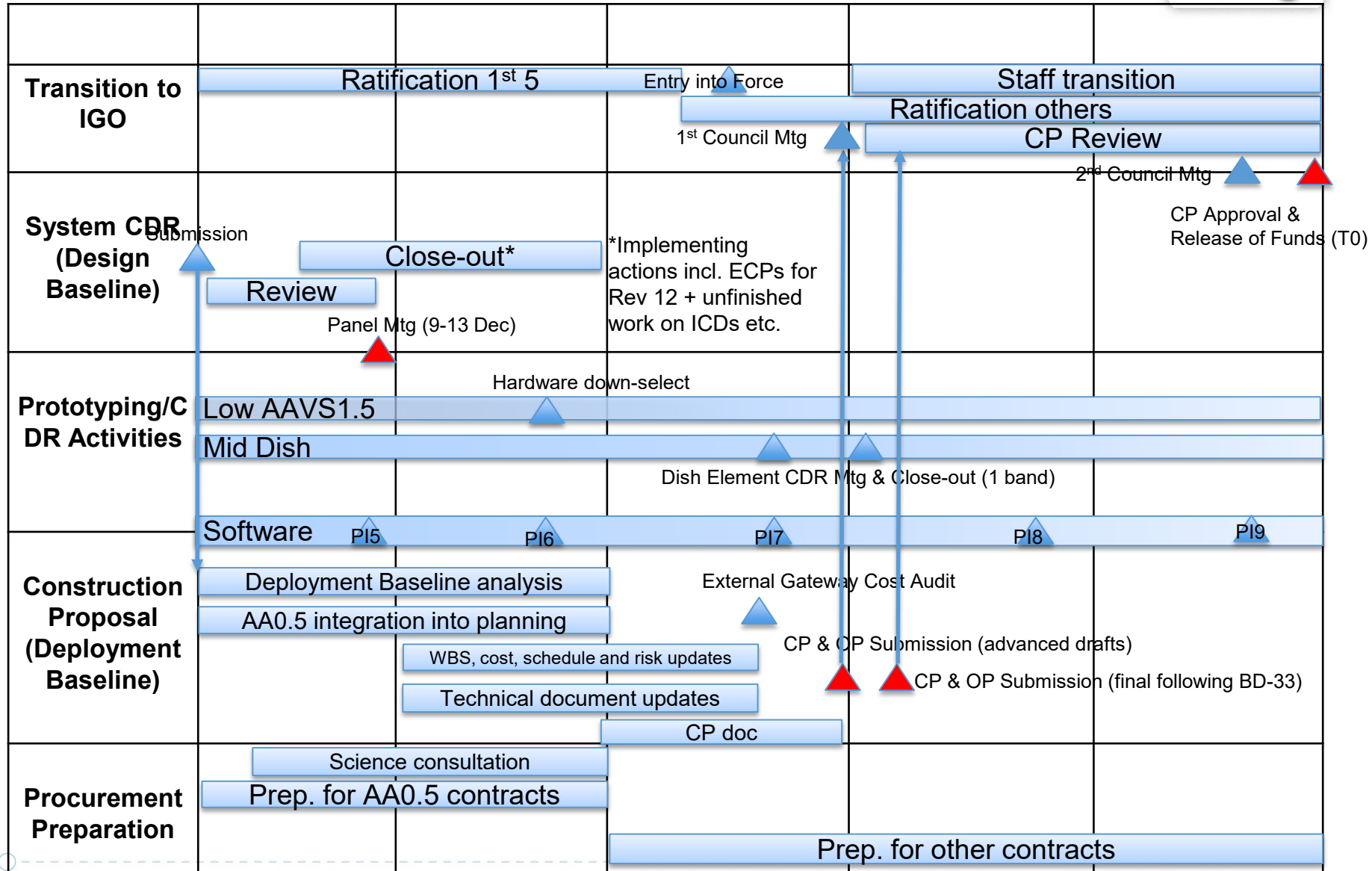
Design Baseline	October 2019 snapshot	Provided through annual contributions			Funding Period
		Construction Support Budget (€M)	Observatory Operations & Business-Enabling Functions (€M)	Observatory Development Programme (€M)	
Total Value (€M) (Dec 2017 euros)	Capital cost of construction (€M)	Construction Support Budget (€M)	Observatory Operations & Business-Enabling Functions (€M)	Observatory Development Programme (€M)	Funding Period
	(760 + 180) = 940	(140 + 26) = 166			
1697	1106		591	(TBD)	2021-2030



Construction Proposal Milestones

- **System CDR**
 - **09 - 13 DEC 2019:** SKA1 System CDR
 - **31 MAR 2020:** SKA1 System CDR close-out critical actions
- **Deployment Baseline**
 - **OCT-MAR 2020:** Deployment Baseline Development
 - SKAO developing detailed scenario based on 2017 process
 - Comments solicited from SWG chairs
 - Town Halls to be arranged for community comment.
- **Construction Proposal**
 - **MAY 2020:** External Gateway Cost Audit of Deployment Baseline
 - **MAY 2020:** SKA Board (BD-32) progress report on CP/OP
 - **JUN 2020:** SKA Observatory Council (1st mtg) see advanced draft of CP/OP
 - **JUL 2020:** Submit fully reviewed, deployment baseline construction proposal to SKA Board (BD-33); Board releases to SKA Observatory Council
 - **NOV 2020:** SKA Observatory Council (2nd mtg) approve construction and operations plan

Pre-Construction Roadmap from S-CDR to T0



Planning for Operations

Rev01 → Rev02

- Rev01 was presented to the Board at BD-29 and to SEAC in June 2019
- Rev02 presented to SEAC end October
- The work in moving from Rev01 to Rev02 has focused in the following major areas

Improving staffing and budget estimates

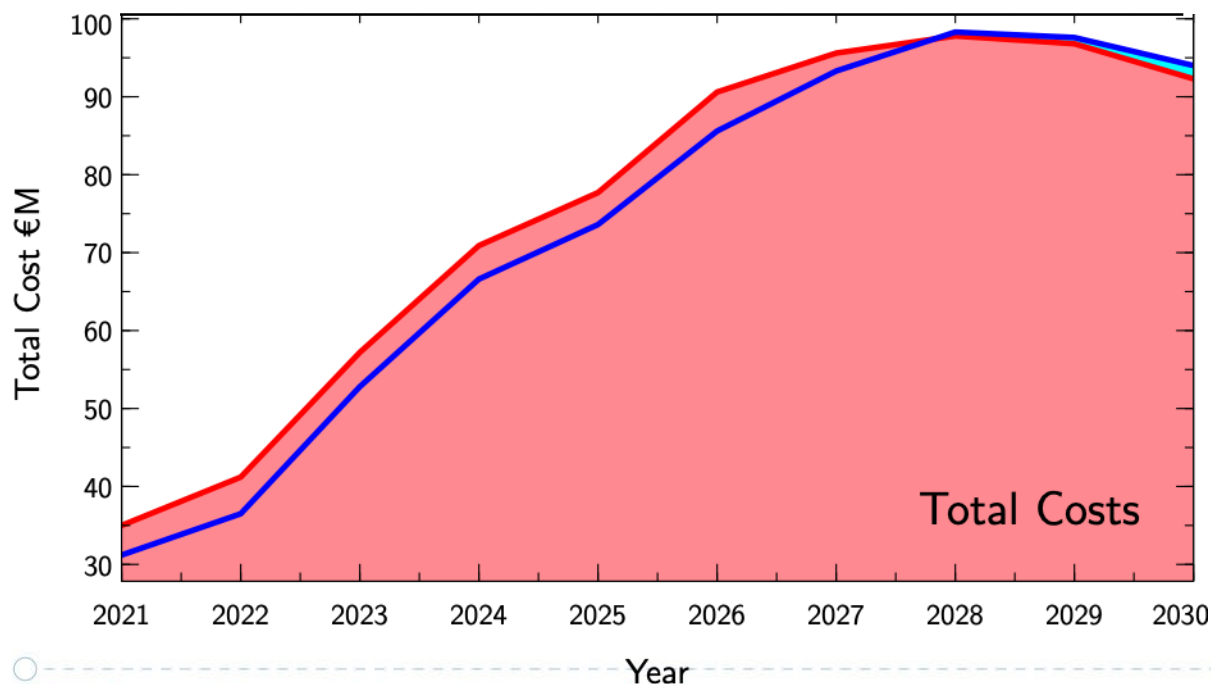
Engineering operations and maintenance

Role descriptions

Summary

- Staffing profile projected for 10-year period from 2021-2030 from Construction and into the Operations phase

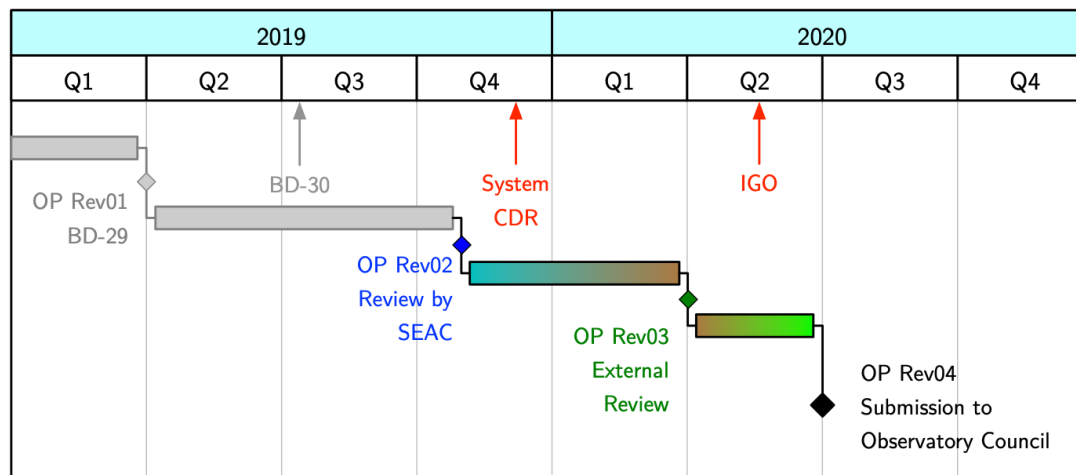
Location	CONSTRUCTION PHASE							OPERATIONS PHASE		
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
GHQ	141.1	145.6	153.1	160.6	169.6	174.1	177.1	147.1	143.6	142.6
AUS	21	35	69	97	106	121	136	126.5	126.5	112
RSA	20.5	39.5	70.5	96.5	110.5	121.5	134.5	124	124	112
TOTAL	182.6	220.1	292.6	354.1	386.1	416.6	447.6	397.6	394.1	366.6



Item	Total (€M)
LOW Power	11.8
MID Power	6.3
Data Transport	6.2
Mid O&M	6.1
LOW O&M	6.0
Staff travel	4.2
DG Contingency	2.5
MID Running	2.5
LOW Running	2.2

Review process

- Review timetable for further revisions of the Operations Plan remains unchanged



- External review panel:
 - Andreas Kaufer (ESO, Chair)
 - Stuartt Corder (ALMA)
 - Claire Chandler (NRAO)
 - Doug Simons (CFHT)

Other matters



Council preparatory task force

- Convention signing established the Council Preparatory Task Force (CPTF)
- CPTF's job: prepare everything to start up the SKA Observatory as an international organization
 - Policies, procedures, oversee preparation for staffing and transition from company
 - Funding construction of the telescopes, procurement etc etc
- We run the secretariat: members are government officials
 - Intense period of activity to mid 2020

Responsibilities

- Provision of advice and assurance on strategic and policy matters relating to transition;
- Assurance of delivery of the transition plan activities;
- Identification and management of high level risks and dependencies;
- Issue resolution and escalation;
- Identification of the resources and capability required to deliver transition;
- Review of the transition at specified key milestones and approval of readiness criteria for the start of transition.

JWGT ToR: Key Responsibilities

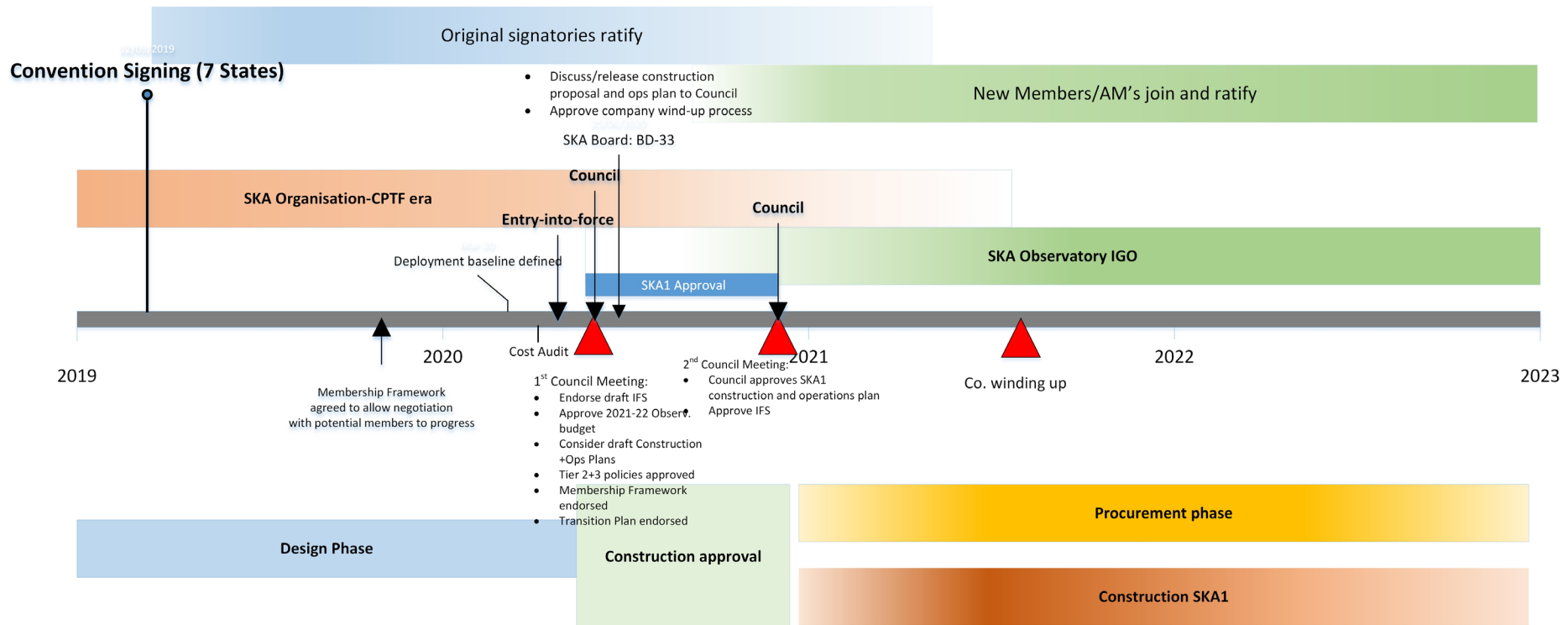
- Provision of advice and assurance on strategic and policy matters relating to transition;
- Assurance of delivery of the transition plan activities;
- Identification and management of high level risks and dependencies;
- Issue resolution and escalation;
- Identification of the resources and capability required to deliver transition;
- Review of the transition at specified key milestones and approval of readiness criteria for the start of transition.

INAF
ISTITUTO NAZIONALE DI AERONAUTICA
E SPAZIO

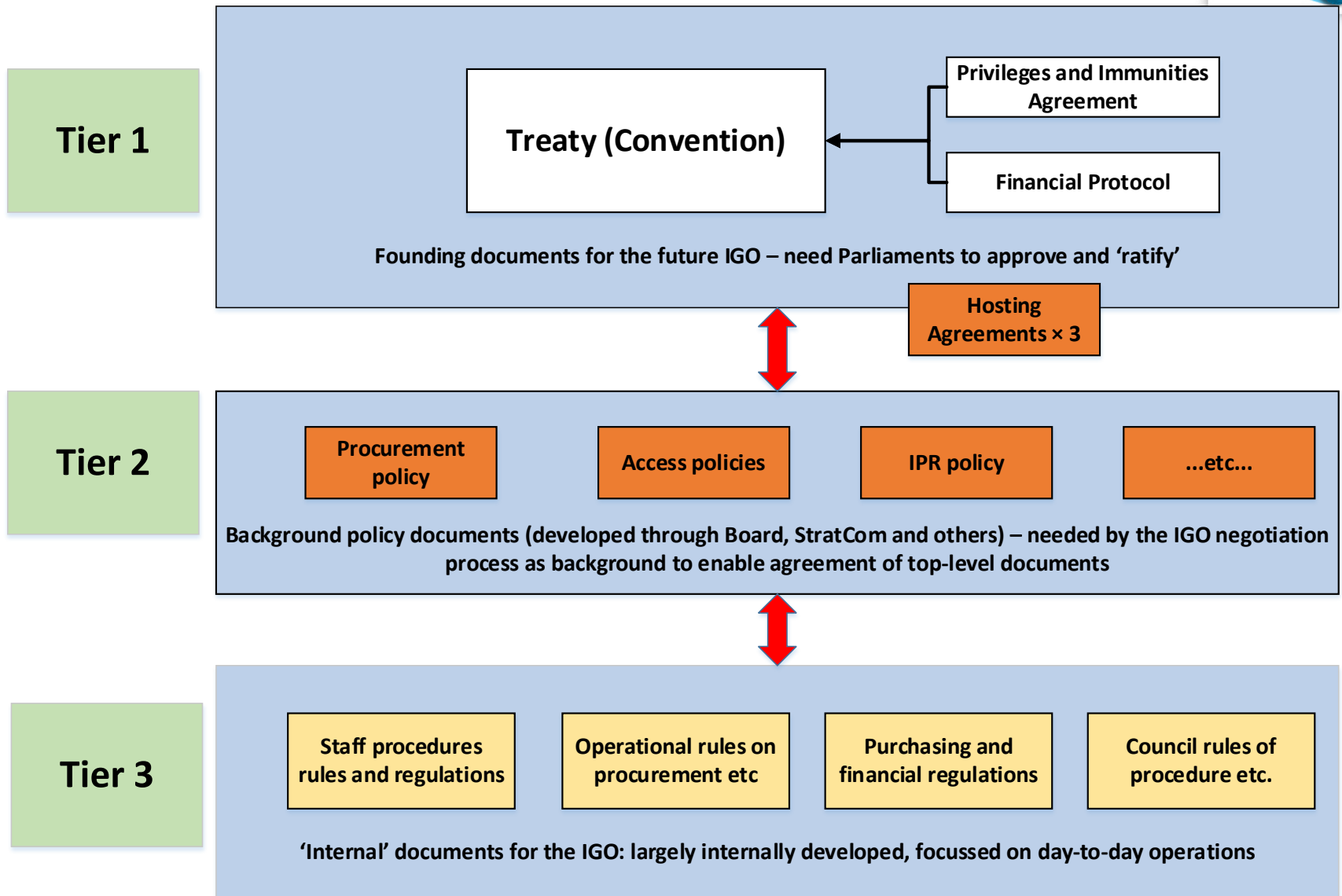
www.inaf.it



Transition Timeline and Milestones: version 5.0 For JWGT and CPTF: September 2019



Construction Proposal to Council





CONVENTION ESTABLISHING THE
SQUARE KILOMETRE ARRAY OBSERVATORY

The Parties to this Convention,

DESIRING to deliver one of the most visionary and ambitious science projects of the 21st century involving significant international cooperation,

COMMITTED to testing the limits of engineering and scientific endeavour and to exploring fundamental questions in astronomy and physics;

NOTING that the Square Kilometre Array will be a next generation radio telescope facility that has a discovery potential far greater than any previous instrument;

RECOGNISING that the scale and ambition of the Square Kilometre Array demands a global effort with long-term investment;

EMBRACING the potential for scientific discovery to contribute to advances in technology and innovation and to deliver a broader benefit for industry and society;

DEDICATED to realizing the full ambition of the Square Kilometre Array Project;

ACKNOWLEDGING the preparatory work done by the Square Kilometre Array Organisation in the establishment of the Square Kilometre Array Observatory;

Annex [...]
Protocol on Privileges and Immunities of the Square
Kilometre Array Observatory

The Parties to the Convention have agreed as follows:

Article 1
Definitions
For the purposes of this Protocol:
a) "Expert" means a person named by the SKAO as being in the service of the SKAO for a defined period of time;
b) "Family" means, with respect to any person, the spouse or partner and/or dependent children forming part of such a person's household;
c) "Official Activities" means all activities undertaken pursuant to the Convention including the SKAO's administrative activities;
d) "Premises" means sites, buildings and facilities or parts thereof, irrespective of ownership, that are occupied exclusively by the SKAO for the performance of its Official Activities;
e) "Representatives" means representatives of the Parties to attendances at meetings of organs or committees of the SKAO designated delegates, alternates, advisors and secretaries;
f) "Staff" means members of staff or secretaries of the SKAO;
g) "Archives" means correspondence, documents, manuscript films, recordings, computer and media data, data carriers, similar material belonging to or held by the SKAO and all contained therein; and
h) "Immunity from legal process" means immunity from jurisdiction from execution measures.

Article 2
Domestic Law
Unless otherwise provided by this Protocol, the activities of SKAO, its Staff, Representatives and Experts shall be governed by the law applicable in the territory of the Member in which such activities are carried out.

Article 3
Immunity from Legal Process
Within the scope of its official activities, the SKAO shall have immunity from legal process.

Privileges and Immunities

Annex [...]
Financial Protocol of the Square Kilometre Array Observatory
Preamble

This Financial Protocol provides a policy framework under which all financial transactions, and other such related financial matters, will take place.

Access Policy
Draft 0.17
SKA Convention Working Group on Operations and Access
Preamble

This Access Policy (hereon referred to as "Policy") applies to all access to the instruments and data of the Square Kilometre Array Observatory (SKAO).

This Policy forms the framework for approval of the Access Rules and Regulations by the SKAO Council, established under the Convention establishing the Square Kilometre Array Observatory (hereon referred to as "Convention"). This Policy should be read alongside the provisions of the SKAO Financial Protocol and will take effect following approval by the SKAO Council.

This Policy primarily pertains to the routine operations phase of the SKAO Project. Policies for science commissioning and early science phases will be determined by the SKAO Council.

- Definitions
Definitions in this Policy are the same as those in the Convention. Additional definitions that are specific to this Policy are below.
- "Access" means to use or benefit from the use of SKAO resources, including time on a telescope or computing-related resources.
 - "Time allocation" is the process by which Access is allocated to SKAO users.
 - "Key Science Projects" (KSPs) are observing projects that require large observing time allocations over a period longer than one Time Allocation Cycle.
 - "Principal Investigator (PI) projects" are observing projects allocated through competitive process that are not Key Science Projects.
 - "Director-General's Discretionary Time" is time allocated by the Director-General outside the normal process of assessment by the Time Allocation Committee.
 - "Share in the project" is as defined in the Financial Protocol.
 - "Open Time" is time available for scientists from Members, Associate Members and Non-members.
 - "Member Time" is time available for scientists from Members and Associate Members.
 - "Original data products" are data products produced by the SKAO.
 - "General data rights" are rights to analyse and publish data for any scientific purpose.

SKAO IP Policy Rev H

SKAO INTELLECTUAL PROPERTY POLICY

Document number SKAO-POL-IPF-001
Revision H
Author T. Kotzé
Date 2016-06-17
Status Draft

Name	Designation	Affiliation	Date	Signature
JC Greenwood/T. Kotzé		Owned by:		
Approved by:				
Released by:				
P. Diamond				

Strategic

Tier 1

Tier 2

Tier 3

Foundational

Constitutional

High Level

30-50

Operational

Implementation

Operational

Implementation

Operational

Implementation

Operational

Implementation

Operational

Implementation

Standard procedures rules and regulations

Operational rules on procurement etc

Financial regulations

Council rules of procedure etc.

'Internal' documents for the IGO: largely internally developed, focussed on day-to-day operations

CONVENTION ESTABLISHING THE
SQUARE KILOMETRE ARRAY OBSERVATORY

The Parties to this Convention,

DESIRING to deliver one of the most visionary and ambitious science projects of the 21st century involving significant international cooperation,

COMMITTED to testing the limits of engineering and scientific endeavour and to exploring fundamental questions in astronomy and physics;

NOTING that the Square Kilometre Array will be a next generation radio telescope facility that has a discovery potential far greater than any previous instrument;

RECOGNISING that the scale and ambition of the Square Kilometre Array demands a global effort with long-term investment;

EMBRACING the potential for scientific discovery to contribute to advances in technology and innovation and to deliver a broader benefit for industry and society;

DEDICATED to realizing the full ambition of the Square Kilometre Array Project;

ACKNOWLEDGING the preparatory work done by the Square Kilometre Array Organisation in the establishment of the Square Kilometre Array Project;

Annex [...] **Protocol on Privileges and Immunities of the Square Kilometre Array Observatory**

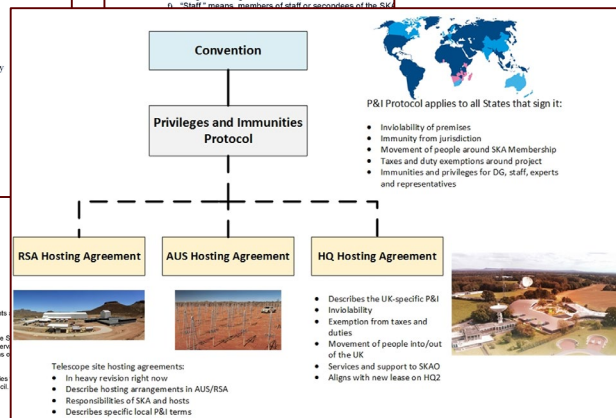
The Parties to the Convention have agreed as follows:

Article 1
Definitions

For the purposes of this Protocol:

- "Expert" means a person named by the SKAO as being in the service of the SKAO for a defined period of time;
- "Family" means, with respect to any person, the spouse or partner and/or dependent children forming part of such a person's household;
- "Official Activities" means all activities undertaken pursuant to the Convention including the SKAO's administrative activities;
- "Premises" means sites, buildings and facilities or parts thereof, irrespective of ownership, that are occupied exclusively by the SKAO for the performance of its Official Activities;
- "Representatives" means representatives of the Parties to attendances at meetings of organs or committees of the SKAO designated delegates, alternates, advisors and secretaries;
- "Staff" means members of staff or associates of the SKAO.

Privileges and Immunities



Tier 1

Tier 2

Tier 3

Procurement and Intellectual Property Working Group (PIPRPWG)
SKA PROCUREMENT FRAMEWORK

Purpose

This paper is an agreed position paper of the Working Group on procurement. The resultant framework will be used as a Procurement Policy possibly together with more detailed Rules & Regulations. This would best be done by legal/procurement drafters.

Overview

The proposed framework comprises:

- Objectives for the SKA procurement framework;
- Principles for the SKA procurement framework; and
- A high-level procurement framework and rules to be implemented by the future SKA Council consistent with the objectives and principles.

Objectives

The primary objective of procurement is to successfully acquire the goods, works and services required to deliver the SKA Project through risk, in-kind contributions or a combination of both, while effectively managing risk.

It is proposed that the following objectives support the 'primary' objective and be used to guide development of the Procurement Policy:

- The Members achieve returns broadly proportional to their financial contribution to the Project (the Fair Work Return (FWR) principle) and specifically that:
 - during the construction phase each partner realises a minimum level of return (Possibly 75% but this requires modelling and agreement);
 - during the operations phase both fixed and non-fixed members have access to appropriate opportunities that will allow them to realise an acceptable level of return; and
 - accounting for return for infrastructure and non-infrastructure contracts will be done separately.
- Where appropriate, members wish to enable positive outcomes for small and medium enterprises in Member Countries;
- Where appropriate, Members want the procurement framework to facilitate consortia arrangements the operate across Member Countries;
- The Members want a procurement framework that is supported by good governance.

Version 4 - 5 July 2016

Access Policy
Draft 0.17
SKA Convention Working Group on Operations and Access

Preamble

This Access Policy (hereon referred to as "Policy") applies to all access to the instruments and sites of the Square Kilometre Array Observatory (SKAO).

This Policy forms the framework for approval of the Access Rules and Regulations by the SKAO Council, established under the Convention establishing the Square Kilometre Array Observatory (hereon referred to as "Convention"). This Policy should be read alongside the provisions of SKAO Financial Protocol and will take effect following approval by the SKAO Council.

This Policy primarily pertains to the routine operations phase of the SKAO Project. Policies science commissioning and early science phases will be determined by the SKAO Council.

Definitions

Definitions in this Policy are the same as those in the Convention. Additional definitions that are specific to this Policy are below.

- "Access" means to use or benefit from the use of SKAO resources, including time on a telescope or computing-related resources.
- "Time allocation" is the process by which Access is allocated to SKAO users.
- "Key Science Projects" (KSPs) are observing projects that require large observing time allocations over a period longer than one Time allocation cycle.
- "Principal Investigator (PI) projects" are observing projects allocated through competitive process that are not Key Science Projects.
- "Director-General's Discretionary Time" is time allocated by the Director-General outside the normal process of assessment by the Time Allocation Committees.
- "Share in the project" is as defined in the Financial Protocol.
- "Open Time" is time available for scientists from Members, Associate Members and Non-members.
- "Member Time" is time available for scientists from Members and Associate Members.
- "Original data products" are data products produced by the SKAO.
- "General data rights" are rights to analyse and publish data for any scientific purpose.

Standard procedures rules and regulations

Operational rules on procurement etc

Financial regulations

Council rules of procedure etc.

'Internal' documents for the IGO: largely internally developed, focussed on day-to-day operations

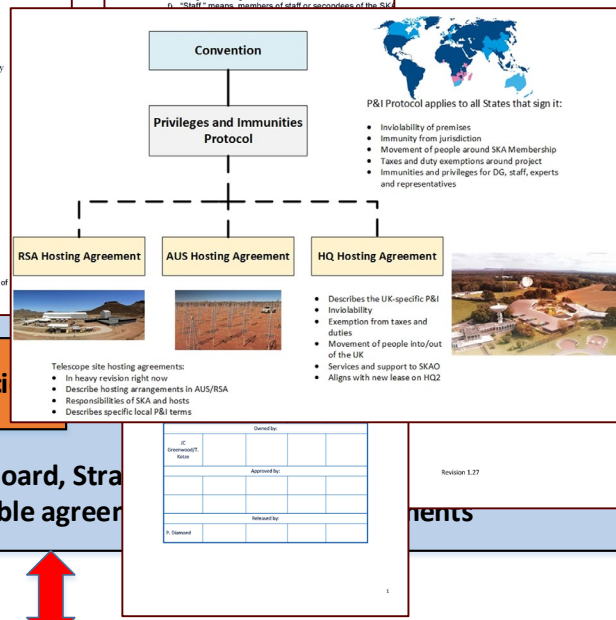
CONVENTION ESTABLISHING THE
SQUARE KILOMETRE ARRAY OBSERVATORY

The Parties to this Convention,
DESIRING to deliver one of the most visionary and ambitious science projects of the 21st century involving significant international cooperation,
COMMITTED to testing the limits of engineering and scientific endeavour and to exploring fundamental questions in astronomy and physics,
NOTING that the Square Kilometre Array will be a next generation radio telescope facility that has a discovery potential far greater than any previous instrument;
RECOGNISING that the scale and ambition of the Square Kilometre Array demands a global effort with long-term investment;
EMBRACING the potential for scientific discovery to contribute to advances in technology and innovation and to deliver a broader benefit for industry and society;
DEDICATED to realizing the full ambition of the Square Kilometre Array Project;
ACKNOWLEDGING the preparatory work done by the Square Kilometre Array Organisation in the establishment of the Square Kilometre Array Observatory;

Annex [...] Protocol on Privileges and Immunities of the Square Kilometre Array Observatory

The Parties to the Convention have agreed as follows:
Article 1
Definitions
For the purposes of this Protocol:
a) "Expert" means a person named by the SKAO as being in the service of the SKAO for a defined period of time;
b) "Family" means, with respect to any person, the spouse or partner and/or dependent children forming part of such a person's household;
c) "Official Activities" means all activities undertaken pursuant to the Convention including the SKAO's administrative activities;
d) "Premises" means sites, buildings and facilities or parts thereof, irrespective of ownership, that are occupied exclusively by the SKAO for the performance of its Official Activities;
e) "Representatives" means representatives of the Parties to the Convention who attend at meetings of organs or committees of the SKAO designated delegates, alternates, advisors and secretaries;
f) "Staff" means members of staff or associates of the SKAO.

Privileges and Immunities



Tier 1

Tier 2

Tier 3

Procurement and Intellectual Property Working Group (P&IPWG)
SKA PROCUREMENT FRAMEWORK
Purpose
This paper is an agreed position paper of the Working Group on procurement. The resultant framework will be used to develop a Procurement Policy together with associated laws & regulations. This would be done by legal/government drafters.
Objective
The proposed framework comprises:
• Objectives for the SKA procurement framework;
• Principles for the SKA procurement framework; and
• A high level procurement framework and rules to be implemented by the future SKA Council consistent with the objectives and principles.
Objectives
The primary objective of procurement is to successfully acquire the goods, works and services required to deliver the SKA Project through cost, to kind contributions or a combination of both, under effective reporting risk.
It is important that the following objectives support the primary objective and be used to guide development of the procurement Policy:
• The Member states members broadly proportional to their financial contribution to the Project (the Fair Share Rules (FSR) principle) and equitable (that being the contribution of each partner reflects an overall level of return, possibly 75% but this requires flexibility and agreement).
• During the operational phase both full and non full members have access to operation opportunities that will allow them to realize an acceptable level of return, and accounting for such for infrastructure and other infrastructure contracts will be done separately.
• Where appropriate, members wish to enable possible outcomes for small and medium enterprises in Member Countries.
• Where appropriate, Members want the procurement framework to facilitate consortia arrangements that support small Member Countries.
• The Member state procurement framework that is supported by good governance.

Access Policy
Date: 3.1.17
SKA Council Working Group on Operations and Access
Purpose
This Access Policy (herein referred to as "Policy") applies to all access to the instruments and data of the Square Kilometre Array Observatory (SKAO).
This Policy forms the framework for approval of the Access Policy and Regulations by the SKAO Council established under the Convention establishing the Square Kilometre Array Observatory (herein referred to as "Convention"). This Policy should be read alongside the provisions of the SKAO Financial Protocol and will take effect following approval by the SKAO Council.
This Policy primarily pertains to the routine operations phase of the SKAO Project. Provisions for science commissioning and early science phases will be determined by the SKAO Council.
Definitions
Definitions in this Policy are the same as those in the Convention. Additional definitions that are specific to this Policy are below:
1. "Access" means to use or benefit from the use of SKAO resources, including time on a telescope or computing related resources.
2. "Time allocation" is the process by which Access is allocated to SKAO users.
3. "Key Science Projects" (KSPs) are observing projects that require large observing time allocations over a period longer than one Time Allocation Cycle.
4. "Principal Investigator" (PI) projects are observing projects allocated through competitive processes that are not Key Science Projects.
5. "Dissemination General" (Dissemination "Gen") is time allocated by the Director-General outside the normal process of assessment by the Time Allocation Committee.
6. "Share in the project" is as defined in the Financial Protocol.
7. "Open Time" is time available for scientists from Members, Associate Members and Non-members.
8. "Member Time" is time available for scientists from Members and Associate Members.
9. "Original data products" are data products produced by the SKAO.
10. "Observer data rights" are rights to analyse and publish data for any scientific purpose.

Staff procedures rules and regulations | Detailed internal rules on procurement etc | Detailed financial regulations | Council rules of procedure etc.

'Internal' documents for the IGO: largely internally developed, focussed on day-to-day operations

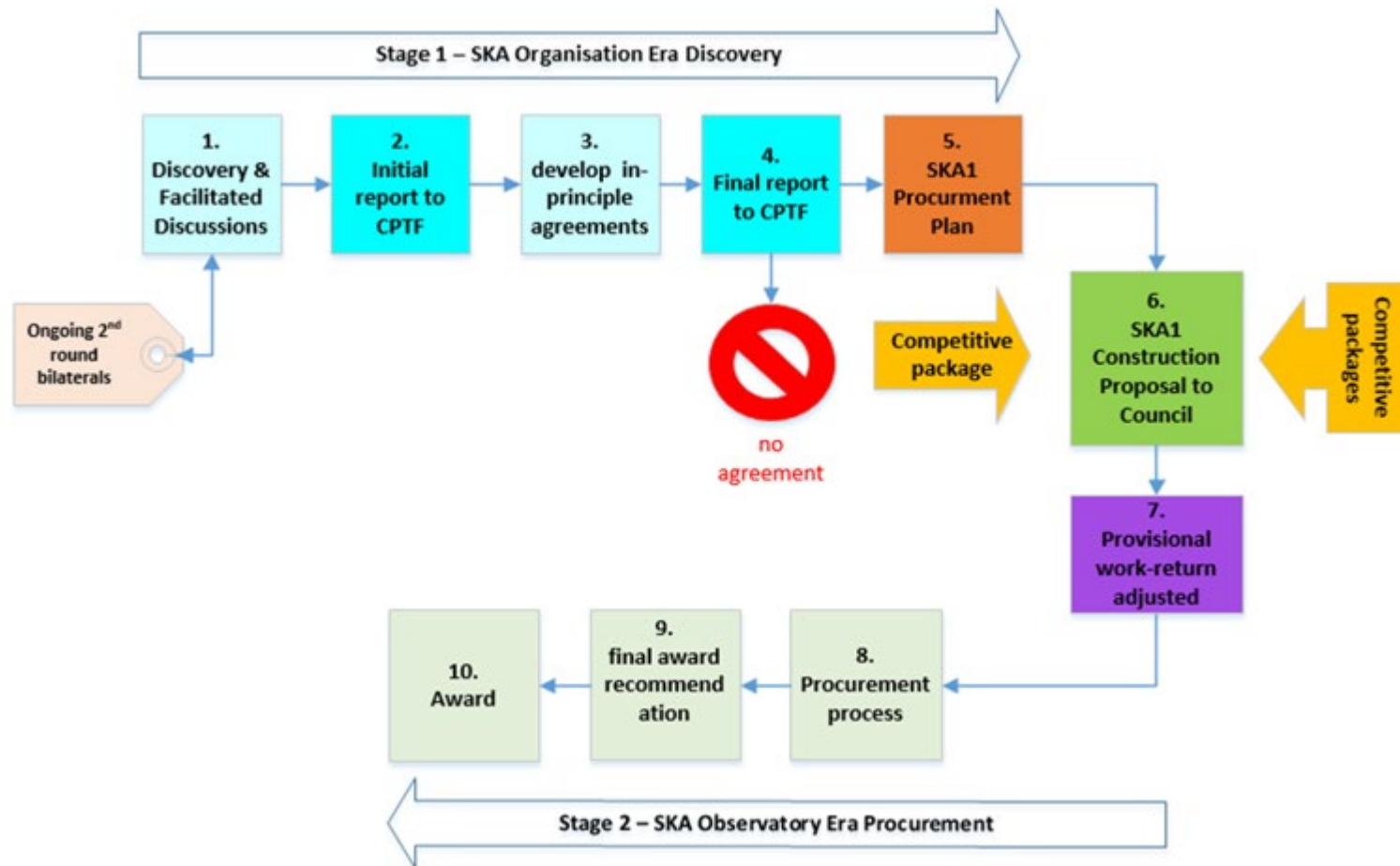
CPTF workplan



	Workstream1 Funding	Workstream2 Membership	Workstream3 Tier2 Docs	Wk stm4 Transition	Workstream5 Tier3 Docs
Who	<p>Lead: SKA Board/ Member Chair – Director General</p> <p>Participation: Members who initial and/or intend to sign in the founding group, potential Members, Observers.</p>	<p>Lead: Chair of CPTF</p> <p>Participation: CPTF and entities who have expressed in accession as Members or Associate Members.</p>	<p>Lead and participation: SKA Office with specialist Tier 2 working group.</p> <p>Inputs provided by:</p> <ul style="list-style-type: none"> • HA: Policy team UK, AUS, RSA • Procurement/IPR; SKAO-led – working group on IP; procurement discussions ongoing • Ops/Access: SKAO with expert groups 	<p>Lead: TOC/ JWGT:</p> <p>Support by Transition Working Group (TWG) of SKA Office</p>	<p>Lead: SKAO</p> <ul style="list-style-type: none"> • Preparatory work by SKAO • Overseen by TOC/JWGT • CPTF plenary endorses overall framework
How	<p>Pre-signing: Bilateral interaction on Funding Schedule context via DG and Board Chair.</p> <p>Post-signing: Continuation of dialogue then multilateral activity</p>	<p>SKA Office supports developing draft documents</p> <p>Specific negotiation team from CPTF engages with prospective member individually</p>	<p>Pre-CPTF supports any requirements for signing process; then, CPTF works on finalizing documents</p>	<p>Activity report for discussion at CPTF plenary and keep the Board informed then agreed.</p>	<p>Support by TWG of Office</p> <p>External expertise:</p> <ul style="list-style-type: none"> • SPB on legal • iSRP on HR • Specialists in 3 Hosts for HR/Finance
Time	<p>Q1 2019- Q3/4 2019</p> <p>Then frozen for Council approval</p>	<p>Q1 2019- Q4 2019</p> <p>Ready for formal accession discussions</p>	<p>Preparation of policies Q1 2019- Q4 2019</p> <p>Approval by Council as soon as practicable</p>	<p>Prep Q1 2019- Q1 2020</p> <p>Council endorse and implements transition</p>	<p>Q4 2018- Q2 2020</p> <p>Preparing for Council Approval</p>

CPTF meetings

- Council Preparatory Task Force. Chair: Patricia Kelly
- Members: countries who have signed Convention and have declared bona fide intention to do so (India, Sweden)
- Purpose: prepare policies required for SKA Observatory Council
 - CPTF1 (13 Mar): establishing CPTF, outline workplan
 - CPTF2 (8 Apr): work schedule
 - CPTF3 (20 Apr): Intellectual Property
 - CPTF4 (24 May): Organisational Design
 - CPTF5 (11 Jun): Procurement
 - CPTF6 (8-9 Jul): Plenary: Tier 2 docs, funding, Assoc membership
 - CPTF7 (5 Sep): Procurement, Infrastructure Weighting
 - CPTF8 (23-24 Sep): Plenary: Procurement, funding, IP
 - CPTF9 (23 Oct): Tier 2 documents
 - CPTF9a (8 Nov): Tier 2 documents
 - CPTF10 (21-22 Nov): Plenary: funding, procurement, etc
- 2nd round of bilaterals undertaken – offering opportunity for more open, informal discussion on key issues, namely Initial Funding Schedule and Procurement



Procurement: Conditional Allocations



Tier 1	Endorsed Lead country	AUS as participant	Canada as participant	China as participant	France as participant	Germany as participant	India as participant	Italy as participant	Japan as participant	Netherlands as participant	Portugal as participant	South Africa as participant	Spain as participant	Sweden as participant	Switzerland as participant	UK as participant
MID																
MID internal																
MID host country																
MID AIV PSC & Internal	South Africa				YES				YES		YES					
MID infra PSC	South Africa					YES					YES					
MID infra	South Africa					YES										
MID CSP	Canada					YES						YES				YES
MID clocks	UK					YES										YES
MID timing	UK	YES										YES	YES			
MID digitisation	Sweden	YES	YES		YES							YES	YES			YES
MID CPF						YES										
MID SPC					YES											
MID networks						YES					YES					
Mid software support																
MID dish PSC	South Africa														YES	
MID Dish Structure	China				YES	YES		YES				YES	YES			
MID band 1	Sweden												YES			YES
Mid band 2													YES			YES
MID band 5	UK				YES						YES	YES	YES	YES		YES
MID SPF services	UK				YES							YES	YES			
MID cryo	UK				YES	YES										
SKAO-SARAO Partnership	South Africa															
LOW																
LOW internal																
LOW host country																
LOW AIV PSC & Internal	Australia				YES				YES							
LOW infra PSC	Australia															
LOW infra	Australia					YES										
LOW CSP	Netherlands	AUS														YES
LOW clocks	UK					YES										YES
LOW timing	UK			YES		YES							YES			
LOW digitisation	Italy			YES		YES	YES	YES						YES		YES
LOW CPF						YES										
LOW SPC																
LOW networks																
LOW software support																
Low field node	Italy	YES		YES			YES			YES			YES		YES	YES
COMMON																
Common internal																
OBS Mgt and Control	India				YES						YES	YES	YES		YES	YES
SDP	UK	YES		YES	YES		YES			YES	YES	YES	YES		YES	YES

Key: red underlining indicates strategic priority

Proposals due from identified Tier 1 leads by Friday

2019 SKA Shanghai Meeting: Concluding our Past, Realising our Future

25-28 November 2019

Asia/Shanghai timezone

Overview

Important Dates

Call for Abstracts

Contribution List

Registration

Participant List

Surveys

Provisional Programme

Conference Payment

Invitation Letter and Visas

Welcome Reception and
Conference Dinner

Transport

Venue and
Accommodation

Local Information and
Activities

Site Visits

Sightseeing in Shanghai

Organising Committees

SKA Organisation, Code of



Second Announcement

The SKA System Design, Operations & Plans

SKA Jobs



Contracts Specialist

This role is ideal for a candidate with experience of procuring complex engineering and construction contracts for an international engineering project.

Area / Department: Business Support function

Contract Type: Permanent

Ref No: 10067

[Read More](#)

Internal Communications Specialist

This role is an ideal opportunity for a talented internal communications specialist to use their skills within a groundbreaking international orga...

Area / Department: Business Support function

Contract Type: Permanent

Ref No: 10061

[Read More](#)

SKA Regional Centre Scientist

This role is an exciting opportunity for a data transfer and scientific data management expert to use their skills and bring their own ideas to develop ...

Area / Department: Telescope Operations

Contract Type: Fixed Term Contract

Ref No: 10063

[Read More](#)

Funded by grant from Foundation MERAC (P. T. Keane)

recruitment.skatelescope.org

Application Deadline: Jan 5th