



## **Market Survey: MID Infrastructure Contract 2**

### **1. Client and Market Survey:**

The SKAO, formally known as the SKA Observatory, is a global collaboration of Member States whose mission is to build and operate cutting-edge radio telescopes to transform our understanding of the Universe, and deliver benefits to society through global collaboration and innovation. Headquartered in the UK, its two telescope arrays will be constructed in Australia and South Africa and be the two most advanced radio telescope networks on Earth. A later expansion is envisioned in both countries and other African partner countries.

Together with other state-of-the-art research facilities, the SKAO's telescopes will explore the unknown frontiers of science and deepen our understanding of key processes, including the formation and evolution of galaxies, fundamental physics in extreme environments and the origins of life. Through the development of innovative technologies and its contribution to addressing societal challenges, the SKAO will play its part to address the United Nations' Sustainable Development Goals and deliver significant benefits across its membership and beyond.

The SKAO invite expressions of interest for the contract described below.

To express an interest in this contract candidates must:

1. Create an account on the [SKAO Supplier Portal](#).
2. Complete the Registration process via the 'Tender notice overview' page for this contract on the SKAO Supplier Portal.

The submission of supporting information or documentation at this stage of the procurement process is not required.

At the next stage invitations to pre-qualify for the contract will be issued according to the indicative timeframe below.

A shortlist of pre-qualified contractors will then be invited to submit tenders.

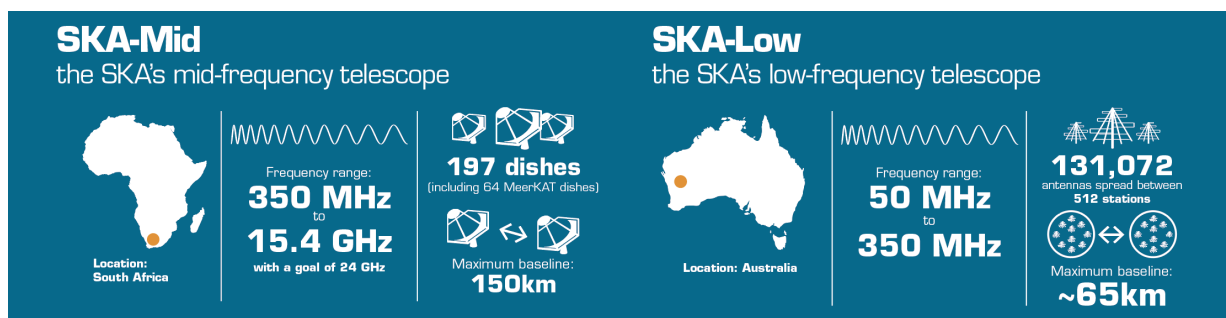
## 2. Project:

The SKAO will have a uniquely distributed character: one observatory, operating two telescopes, on three continents for the global scientific community.

The two SKAO telescopes will be located in radio quiet zones in South Africa and Western Australia. They differ in design and are complementary by their very nature. Both are interferometers: arrays of antennas which when linked together act as one enormous telescope, bigger than would ever be possible in a traditional single-dish design.

In South Africa, the SKA-Mid telescope will initially comprise 197 dishes, 64 of which are already in place and form the MeerKAT precursor telescope, itself a world-class facility, which will be integrated into SKA-Mid. In Western Australia, an initial 131,072 low-frequency antennas will form the SKA-Low telescope, spread across 512 antenna stations.

The telescopes' design is scalable and upgradable, allowing future improvements to maintain their world-leading capabilities, and also to align with available funding. This includes state-of-the-art scientific and computing infrastructures, designed to progressively exploit the capabilities of the Observatory as computing technology continuously improves over coming decades.



## 3. Contract:

MID Infrastructure Contract 2: Buildings Upgrade (including Power Facility, Grid Power and Building Management System).

## 4. Contract Description:

The successful Contractor will be required to take responsibility for the design of the whole of the works. The tender package will include a reference design, which has been prepared by SKAO. Tenderers will be able either to adopt the reference design and provide such additional new design as necessary to complete it, or to prepare a fully new design. New design prepared by the Contractor will be subject to an acceptance procedure. The SKAO reference design will be deemed to have been accepted.

The Contractor's Scope is the design, manufacture, supply, delivery, installation, testing, commissioning and training associated with the following works:

	<b>Scope</b>	<b>Brief description</b>
<b>1</b>	<b>Grid Power</b>	
1.1	Pegging of Line Route & Live Chamber Enclosure	Approved Registered Land Surveyor to Peg Line Route and Live Chamber
1.2	Soil Resistivity Measurements	Soil resistivity measurements by an accredited firm needs to be executed to prepare for the design of the earth mat
1.3	Design Earth Mat	STATCOM & Live Chamber earth mat design is required based on the above soil resistivity tests
1.4	STATCOM & Transformer Civil Works	STATCOM & Transformer civil works, bund walls, Live Chamber works needs to be executed
1.5	STATCOM & Transformer Installation	STATCOM & Transformer installation
1.6	Wooden Pole Installation	All Wooden Pole Structures needs to be installed based on design and final site agreed pegged positions
1.7	C/T & V/T and Pole Mount Breaker Installation	Install Equipment on the Wooden H-Poles – C/T & V/T Unit and Pole Mount breaker, including all control and measurement kiosks
<b>2</b>	<b>Power Facility</b>	
2.1	Diesel Rotary Uninterrupted Power Supply (DRUPS) Equipment - Upgrade Existing	Expand the existing diesel rotary UPS Installation to 3.75 MW total (2.5 MW in N-1) by upgrading the cooling systems
2.2	Diesel Rotary UPS (DRUPS)	Install two new diesel rotary UPSs to match the existing (after the cooling pack upgrade, i.e. 1.25 MW capability)
2.3	Power Transformers	Replace the existing two 2.5 MVA 33 / 22 kV transformers with two new 6 MVA (site rating) units
2.4	22 kV and 33 kV switchgear in the medium Voltage (MV) Room	Replace current transformers, terminate new cabling, disconnect and remove existing cabling, re-labelling, reprogram the existing relays.
2.5	Mimic Panel	Update the existing mosaic mimic panel to reflect the new network
2.6	Pole 951 /Ring Main Unit (RMU)/ Spare cable	Replace 100 A fuses at Pole 951 with load break isolator and circuit breaker in new RMU, including trenching and related civil works
2.7	Low Voltage (LV) Assemblies Upgrade	Upgrade the Main LV distribution board (DB) to suit
2.8	Bulk Fuel Facility	The existing fuel facility shall be expanded with two new 70 kl horizontal steel tanks.
2.9	Sound attenuation	Design and install supplementary noise attenuation (if required)
2.10	Remote Monitoring	Ensure Modbus interfaces are available and provide all required information to allow integration with existing Building Management System (BMS)
2.11	Earthing, bonding and lightning protection	Implemented on all the new/modified installations to suit.
2.12	Power and Instrumentation / Control Cabling	Implemented on all the new/modified installations to suit.
2.13	Dummy Load	The existing 900 kW dummy load inside the DRUPS plant room will need to be relocated – include new container, LV switchboard, RMU, transformer and related civil works

	<b>Scope</b>	<b>Brief description</b>
2.14	Protection Studies and Implementation and Commissioning Oversight	Develop a protection scheme for the SKAO installation system including the power facility equipment, the grid and reticulation installation elements.
2.15	Notices, Labelling, Signage, Operating Instructions	Implemented on all the new/modified installations to suit.
2.16	Temporary Dummy Loads for on-site testing and temporary standby power	Provide (mobile) dummy loads for the DRUPS site commissioning and coordinated STATCOM integration and standby power during shut-downs
2.17	Ancillaries and Extras	Additional activities required on the new/modified installations
<b>3</b>	<b>Data Rack Power</b>	
3.1	Distribute power to Radio Frequency Interference (RFI) filters	New cable installations from main low voltage distribution board to existing RFI filters.
3.2	Distribute power from RFI penetrations to Distribution Boards.	New cable installations from existing RFI filters to new Distribution Boards
3.3	Heating Ventilation and Air Conditioning (HVAC) Distribution Boards	Upgrade existing HVAC Distribution Boards with new switch gear and metering
3.4	Distribute power to Data Rack Area (DRA) Computer Room Air-conditioning (CRAC)	New cable installation to DRA (Data Rack Area) CRAC units
3.5	Data Rack Distribution Boards	New Data Rack Distribution Boards inside DRA
3.6	Distribute power to Racks	New Busway installation and Tap-off boxes for row F to G. Connection to appropriate Data Rack Distribution Board via new caballing.
3.7	Provide power to TFR Racks	Remove existing supply and relocate to new Data Rack Distribution board as per appropriate drawing
3.8	The Measurement of power	All new and upgrade CRAC Distribution Boards to be equipped with power meters. Power meters to be interfaced with BMS.
3.9	The Protection of power	All new Distribution Boards shall be equipped with appropriate surge protection and circuit breakers.
<b>4</b>	<b>Building Management System (BMS)</b>	
4.1	Monitor Carnarvon POP (Point of Presence) station	Interfacing to existing equipment
4.2	Monitor Klerefontein site	Interfacing to new equipment
4.3	Monitor CPF	Interfacing to equipment, typically Switchgear, DRUPS, Transformers, fuel system, HVAC and door sensors.
4.4	Monitor Core Power/Spiral Arm Power	Measurement of power per receptor
4.5	Provide BMS GUI	Provides site, building, device, report and electrical pages
4.6	Provide BMS data	Provide data to subscribers and store and retrieve BMS data.
4.7	Configure BMS	Metering device and Network configuration.
<b>5</b>	<b>Building Ancillaries</b>	
5.1	Fire Detection and Suppression	Minor Detection upgrades

	<b>Scope</b>	<b>Brief description</b>
5.2	RFI penetrations	Additional penetrations for DRUPS cooling system
5.3	Lighting	Minor upgrades and relocation of luminaires
5.4	Emergency Lighting	Minor upgrades and repairs
5.5	Small Power	Additional socket outlets in DRA
5.6	Motion Detection	Minor upgrades and relocation of sensors
5.7	Door Open Sensors	The fitment of additional switches to Power Facility Doors
5.8	Cable trays / Fibre guides	The relocation of existing, and the installation of additional cable trays and fibre guides in the DRA
5.9	Surveillance Cameras	The installation of additional surveillance cameras in the DRA
5.10	Antistatic Test Station	The Installation of an antistatic test station in the DRA
5.11	GNSS Precision Antenna Mount	The provision of additional GNSS mounting pillars on the roof of the Power Facility
<b>6</b>	<b>LINFRA<sup>1</sup> Scope</b>	
6.1	LINFRA cabinets / racks	The supply, delivery and installation of specified cabinets in the Data Rack Area of an existing building (KDRA).
6.2	Power Distribution Units	The supply, delivery, installation, and connection of specified Power Distribution Units (PDUs) in the cabinets in the KDRA
6.3	GNSS RFI-Shielded Cabinet	The design, supply, delivery and installation of an RFI-Shielded cabinet to be mounted on the roof of an existing building in close proximity to the GNSS receivers including power supply and fibre cable connectivity to the MASER/TFR (transfer) Room and support infrastructure

## 5. Tender Evaluation and Key Criteria:

- a. The Contractor (or Lead Contractor if a joint venture) should have a CIDB contractor grading designation of either 8GB/8EB/8EP or higher.
- b. The Contractor should have competent in-house or subcontracted design engineers/consultants for the various disciplines covered in the scope.
- c. The Contractor (including design engineers) should demonstrate experience in building and power facility upgrade design and construction of similar size and scope.
- d. NEC (New Engineering Contract) contracting experience is essential.
- e. A "most economically advantageous tender evaluation method" will be adopted which will include both price and functionality/quality criteria.
- f. The Contractor will be required to subcontract up to 30% of the value of this contract excluding major materials and equipment, to local contractors. The tenders that the Contractor prepares in terms of this requirement, must be offered first to South African citizens in and around the Carnarvon, Williston, Brandvlei and Van Wyksvlei Local Municipalities (in Karoo Hoogland and Kareeberg District Municipalities, respectively). Should no suitable contractors be shown to be available, offers may be extended to the area of the Northern Cape Province.

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<sup>1</sup> Local Infrastructure

The SKAO is an inter-governmental treaty organisation, and conducts its procurement and tender processes in accordance with its own procurement policies.

## 6. Contract Form:

The Contract will be executed under the NEC4 Engineering and Construction Contract (ECC) contract - Option A.

## 7. Indicative Timeframe:

Subject to the SKAO Council approving the SKA Construction Proposal in June 2021 and the meeting of other requirements, the table below sets out the **indicative timeframe** for this Contract:

Market Survey close	23 July 2021
Pre-Qualification period	26 July 20201 -13 August 2021
Invitation to Tender issued	27 August 2021
Closing date of Tenders	22 October 2021
Contract Award	22 February 2022
Completion (installation)	30 November 2023
12 month Defects Period	30 November 2024