



---

<b>Client</b>	<b>: NRF (National Research Foundation)</b>
<b>Project</b>	<b>: SARAO Operations</b>
<b>Type</b>	<b>: Requirement Specification</b>


---

## **AIR CHARTER SCOPE OF SERVICES**

Document number	SSA0000-0000V1-01 RS
Revision	3
Classification	Commercial in Confidence
Author	D Liebenberg, P Kotzé, R Young, et.al.
Date	22 September 2023

## Commercial In Confidence

**DOCUMENT APPROVAL**

	Name	Designation	Affiliation	Signature
<b>Author</b>	R. Young	System Engineering Manager	SARAO	
<b>Reviewed</b>	D. Liebenberg	Logistic Engineering Manager	SARAO	<u>DLiebenberg</u> DLiebenberg (Sep 28, 2023 08:42 GMT+2)
<b>Approved</b>	C. Gumede	Head of Operations	SARAO	<u>scgumede</u> scgumede (Sep 28, 2023 09:21 GMT+2)

**DOCUMENT HISTORY**

Revision	Date Of Issue	ECN Number	Comments
1	17 May 2010	N/A	1 <sup>st</sup> Release
2	6 Feb 2017	MKAT-CN-0088	2 <sup>nd</sup> Release
3	22 Sep 2023	MKAT-CN-0152	3 <sup>rd</sup> Release for 2023 Tender

**DOCUMENT SOFTWARE**

	Package	Version	Filename
<b>Wordprocessor</b>	MsWord	Word 2016	SSA0000-0000V1-01 RS Rev 3

**COMPANY DETAILS**

Name	SARAO
Physical/Postal Address	2 Fir Street, Black River Park (North Gate Entrance), Observatory, Cape Town, 7925, South Africa
Tel.	+27 21 506 7300
Fax.	+27 21 506 7375
Website	<a href="http://www.sarao.ac.za">www.sarao.ac.za</a>

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>5</b>
1.1	SARAO Background .....	5
1.2	Requirement Background .....	6
1.3	Applicable Documents .....	6
1.4	Service Provider Response Requirements .....	7
<b>2</b>	<b>AIR CHARTER SERVICE REQUIREMENTS .....</b>	<b>8</b>
2.1	Service Provider Company & Aircraft Information Requirements.....	8
2.2	Service Provision Requirements.....	10
2.3	Taxes, Fees, Commissions & Price Fluctuation Requirements.....	12
2.4	CPTN International and Lanseria Arrival/Departure Requirements.....	12
2.5	En Route Requirements .....	13
2.6	Karoo Radio Observatory Airfield Arrival/Departure Requirements .....	14
2.7	Procedures for Aircraft Using the Karoo Radio Observatory Airfield.....	15
2.7.1	Karoo Radio Observatory Airfield General Procedures.....	15
2.7.2	Karoo Radio Observatory Airfield Aircraft Approach Procedure .....	17
2.7.3	Karoo Radio Observatory Airfield Aircraft Depart Procedure .....	18

## APPENDICES

Appendix A – Prescribed Aircraft Approaches/Departures To/From the Karoo Radio Observatory Airfield	19
---	----

## LIST OF FIGURES

Figure 1 - Radio Astronomy Reserve, Northern Cape	5
Figure 2 - Prescribed Aircraft Approaches/Departures To/From the Karoo Radio Observatory Airfield	21

## ABBREVIATIONS

CAA	Civil Aviation Authority
CPTN	Cape Town
DME	Distance Measuring Equipment
ETA	Estimated Time of Arrival
FBO	Fixed Based Operation
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
ICAO	International Civil Aviation Organisation
IFF	Identification Friend or Foe
KROA	Karoo Radio Observatory Airstrip
NM	Nautical Mile
NRF	National Research Foundation
OLS	Obstacle Limitation Surfaces
REQ	Requirement
RFI	Radio Frequency Interference
RNAV	Radio Navigation
SA	South Africa
SACAA	South African Civil Aviation Authority
SARAO	South African Radio Astronomy Observatory
SBD	Standard Bidding Document
SKA	Square Kilometre Array
SOP	Standard Operating Procedure
TCAS	Traffic Collision Avoidance System
USD	United States Dollar
ZAR	South African Rand

# 1 INTRODUCTION

## 1.1 SARAO BACKGROUND

The South African Radio Astronomy Observatory (SARAO), a facility of the National Research Foundation, is responsible for managing all radio astronomy initiatives and facilities in South Africa, including the MeerKAT Radio Telescope in the Karoo, and the Geodesy and Very Long Baseline Interferometry (VLBI) activities at the HartRAO facility. SARAO also coordinates the African VLBI Network (AVN) for the eight SKA partner countries in Africa, as well as South Africa's contribution to the infrastructure and engineering planning for the Square Kilometre Array (SKA) Radio Telescope. To maximise the return on South Africa's investment in radio astronomy, SARAO is leading South Africa's involvement in the SKA on behalf of the Department of Science & Innovation.

Information about the project is available from [www.sarao.ac.za](http://www.sarao.ac.za). Information about the international SKA project is available from [www.skao.int](http://www.skao.int).

The MeerKAT System is the South African SKA precursor and will form part of the core of the SKA Mid-frequency telescope. It is situated about 80km from the small town of Carnarvon in the Northern Cape Province inside the Radio Astronomy Reserve which is protected by the South African Astronomy Geographic Advantage Act (Act 21 of 2007). The Radio Astronomy Reserve covers an area of 12.5 million hectares with strict regulations controlling the generation and transmission of interfering radio signals in the reserve and the area around it.

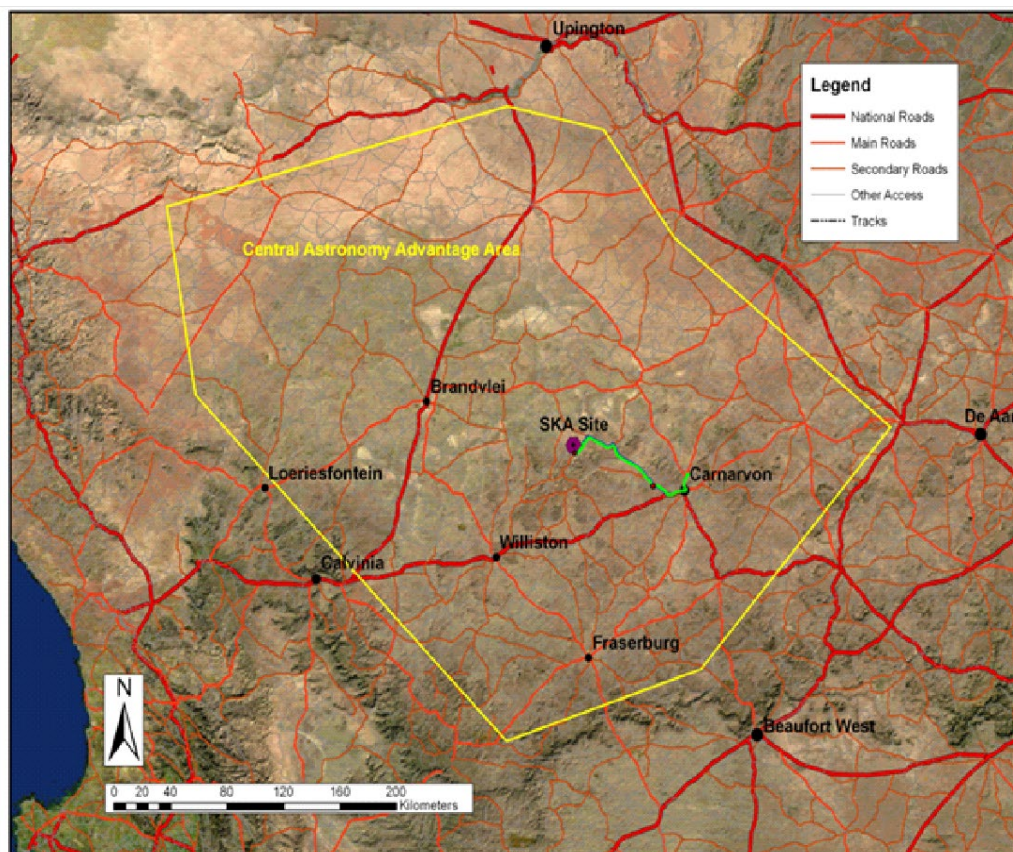


Figure 1 - Radio Astronomy Reserve, Northern Cape

The MeerKAT Array Site is where the MeerKAT Antennas are constructed and is  $\pm 10$ km from the Losberg Site Complex. The Losberg Site Complex consists of various buildings for Accommodation, Infrastructure Services and Telescope Construction, Support and Maintenance.

As part of the MeerKAT Infrastructure an all-weather surface, day operations, **Karoo Radio Observatory Airfield (KROA)** has been constructed close to the Losberg Site Complex which is to be used for air charter services to the Karoo Astronomy Reserve. The airfield is registered with the SACAA as the 'Square Kilometre Array South Africa' with registration number VR041.

The Klerefontein Support Base is located at Klerefontein approx. 12km from Carnarvon. The Klerefontein Support Base is the main SKA Karoo Astronomy Reserve offices complex and is utilised for Operations, Maintenance and Support of the MeerKAT System.

## **1.2 REQUIREMENT BACKGROUND**

SARAO requires a safe, reliable, flexible and cost-effective Air Charter Service to transport personnel and small light cargo from Cape Town and Gauteng to the Karoo Astronomy Reserve.

It is SARAO's intention to contract an accredited Air Charter Company to provide services based on the requirements of this document for as long as such services are required to fulfil its operational needs.

This contract will have the aim of providing SARAO with peace of mind in terms of safety of its personnel, reliability and availability of services at the best price and a One-Stop-Solution.

## **1.3 APPLICABLE DOCUMENTS**

- [1] **Airstrip General Layout**  
Aurecon, Document 126/RDS/AS/01 Rev 3
- [2] **Airstrip Typical Section**  
Aurecon, Document 126/RDS/AS/02 Rev 4
- [3] **Airstrip Runway Long Section**  
Aurecon, Document 126/RDS/AS/03 Rev 6
- [4] **Airstrip Obstacle Limitation Surfaces**  
Aurecon, Document 126/RDS/AS/04 Rev B
- [5] **Airstrip OLS General Layout**  
Aurecon, Document 126/RDS/AS/05 Rev B

## 1.4 SERVICE PROVIDER RESPONSE REQUIREMENTS

SARAO requirements have been structured into several categories, see sections 2.1 to 2.7 below.

Each requirement is uniquely identified, i.e. REQ01 with a Description and Type.

Service Providers are to take note of the “Type” of requirement as follows:-

**“Mandatory”**. Service providers must at least meet all the mandatory requirements (GO/NO-GO evaluation) as a prerequisite to qualify for the cost evaluation of the tender.

**“Preferable”** Service providers may provide these requirements at an additional cost which can be selected (or not by SARAO).

**“Optional”** Service providers may provide this but at no additional cost.

Service Providers are requested to provide a Compliance Statement for each SARAO Requirement as follows;

**C** Meaning **full compliance** is provided to the requirement by the Service Provider with remarks if required in the Compliance Remarks column.

**P** Meaning **partial compliance** is provided to the requirement by the Service Provider with explanatory information provided in the Compliance Remarks column.

**N** Meaning **no compliance** is provided to the requirement by the Service Provider with remarks if required in the Compliance Remarks column.

**N/A** Meaning that the specific requirement is considered **not applicable** to the service offered by the Service Provider.

Service Providers are requested to provide the completed Compliance Statement and requested Standard Bidding Document (SBD) forms as per the tender documents.

## 2 AIR CHARTER SERVICE REQUIREMENTS

### 2.1 SERVICE PROVIDER COMPANY & AIRCRAFT INFORMATION REQUIREMENTS

Req ID	Description	Type	Compliance	Compliance Remarks
REQ1	<b>Service Provider Detail:</b> Provide Company name and registration number	Mandatory		
REQ2	<b>Service Provider Operating Licence:</b> Provide details of Company Operating Licence	Mandatory		
REQ3	<b>Service Provider Track Record:</b> Provide details of Company History and Client List	Mandatory		
REQ4	<b>Service Provider Point of Contact:</b> Provide details of single point of contact for all our needs	Mandatory		
REQ5	<b>Fleet Identification:</b> How many and what aircraft are currently in operation with the Service Provider, even if not applicable to the service required by SARAO. For each aircraft type, identify whether it may be used for SARAO service to site.  <b>Note:</b> <u>due to the sensitive nature of the radio telescope, no aircraft with spark ignition piston engines will be considered for SARAO site service.</u>	Mandatory		
REQ6	<b>Aircraft Age:</b> Provide the ages of Aircraft considered for utilisation for services required by SARAO	Mandatory		
REQ7	<b>Aircraft Ownership:</b> Provide a statement regarding ownership of Aircraft considered for utilisation for services required by SARAO. Also state owner permissions for services required by SARAO should it be applicable	Mandatory		
REQ8	<b>Aircraft Maintenance:</b> Provide details of Aircraft maintenance for Aircraft considered for utilisation for services required by SARAO. (In-house or outsourced)	Mandatory		



## Commercial In Confidence

Req ID	Description	Type	Compliance	Compliance Remarks
REQ9	<b>Aircraft Security:</b> Provide details of Aircraft Security at Fixed Based Operation (FBO)	Mandatory		
REQ10	<b>Crew Qualifications:</b> Provide details of qualifications, certifications & experience of Flight Crew considered for utilisation for services required by SARAO	Mandatory		
REQ11	<b>Crew Training:</b> Provide details of Flight Crew recurrent training	Mandatory		
REQ12	<b>Service Provider Certifications/Accreditations:</b> Provide details on <i>International Civil Aviation Organisation</i> (ICAO) Certifications/Accreditations where applicable	Optional		
REQ13	Provide details on <i>South African Civil Aviation Authority</i> (SACAA) Certifications/Accreditations, covering the classes of licenses held and the categories of aircraft covered by the relevant licenses	Mandatory		
REQ14	Provide details on <i>South African Operating Certificate</i> Part 135 Certifications/Accreditations	Mandatory		
REQ15	Provide details on any Certifications/Accreditation as an <i>Aviation Training Organisation (ATO)</i> / <i>Designated Training Organisation (DTO)</i> where applicable	Optional		
REQ16	Provide details on any other Certifications/Accreditations where applicable	Optional		

## 2.2 SERVICE PROVISION REQUIREMENTS

Req No	Description	Type	Compliance	Compliance Remarks
REQ17	<b>Route: Cape Town</b> CPTN International – Karoo Radio Observatory Airstrip - Return Optional Stop at Carnarvon Airport	Mandatory		
REQ18	<b>Route: Gauteng</b> Lanseria Airport - Karoo Radio Observatory Airstrip – Return Optional Stop at Carnarvon Airport. Check if other options in Gauteng area	Mandatory		
REQ19	<b>Route: Cape Town</b> CPTN International – Calvinia Airstrip – Return			
REQ20	<b>Days for same day return:</b> Wednesday same day return When these days are public holidays, no flights shall be applicable unless specifically requested by SARAO	Mandatory		
REQ21	<b>Days for overnight return:</b> Wednesday returning Thursday When these days are public holidays, flight days may be changed as requested by SARAO	Mandatory		
REQ22	<b>Departure Times:</b> From CPTN International                      07h30B nominally From Lanseria Airport                        06h30B nominally From Karoo Radio Observatory Airfield   17h00B nominally	Mandatory		
REQ23	<b>Passengers per flight:</b> Aircraft size to carry up to 8 passengers per flight (Indicate if more is possible)	Mandatory		

## Commercial In Confidence

Req No	Description	Type	Compliance	Compliance Remarks
REQ24	<b>Aircraft Types &amp; Crew Size:</b> Aircraft type with Crew size best suited and cost effective for number of passengers as per REQ23	Mandatory		
REQ25	<b>Passenger Baggage:</b> Passenger baggage at least 10kg per passenger as per REQ23. Please indicate limitations with respect to type and dimensions of baggage	Mandatory		
REQ26	<b>Additional Cargo:</b> From time to time it may be required to transport small equipment up to 20kg per item in addition to passengers. Please advise Cargo size and weight restrictions per aircraft type for services required by SARAO	Optional		
REQ27	<b>Aircraft Availability:</b> Aircraft availability and serviceability must be guaranteed as part of the One-Stop-Solution contracted to a successful Service Provider	Mandatory		
REQ28	<b>Crew Availability:</b> Crew availability must be guaranteed as part of the One-Stop-Solution contracted to a successful Service Provider	Mandatory		
REQ29	<b>Traffic Rights, Flight Authorisations &amp; Landing Rights:</b> Any rights and Authorisations required for the flights shall <b>not</b> influence the service availability and <b>not</b> result in additional costs	Mandatory		
REQ30	<b>Passenger Insurance:</b> Passenger insurance are included in the service and cost. Indicate cover per passenger	Mandatory		
REQ31	<b>Flight request and confirmation by SARAO:</b> Flights booked and confirmed at least 2 days in advance by SARAO	Mandatory		

## Commercial In Confidence

**2.3 TAXES, FEES, COMMISSIONS & PRICE FLUCTUATION REQUIREMENTS**

Req No	Description	Type	Compliance	Compliance Remarks
REQ32	<b>Airport Taxes:</b> All taxes applicable shall be part of the agreed to cost and shall <b>not</b> result in additional costs for SARAO	Mandatory		
REQ33	<b>Non-Objection Fees:</b> Non-Objection Fees shall <b>not</b> result in additional costs for SARAO	Mandatory		
REQ34	<b>Fuel Surcharge Fees:</b> Fuel Surcharge Fees shall <b>not</b> result in additional costs for SARAO	Mandatory		
REQ35	<b>Fuel Price Fluctuations:</b> Fuel price fluctuations to be substantiated and may only apply to the non-fixed portion of total cost	Mandatory		
REQ36	<b>Exchange Rate Fluctuations:</b> Exchange rate fluctuations shall <b>not</b> result in additional costs for SARAO	Mandatory		
REQ37	<b>Agent Commission:</b> Commissions of any sort shall <b>not</b> result in additional costs for SARAO	Mandatory		

**2.4 CPTN INTERNATIONAL AND LANSERIA ARRIVAL/DEPARTURE REQUIREMENTS**

Req No	Description	Type	Compliance	Compliance Remarks
REQ38	<b>Parking Facilities for Passengers:</b> Safe parking facilities to be available for passengers at the Service Provider departure points	Mandatory		
REQ39	<b>Lounges:</b> Basic lounge services to be available for passengers at Service Provider departure points	Mandatory		

## 2.5 EN ROUTE REQUIREMENTS

Req No	Description	Type	Compliance	Compliance Remarks
REQ40	<b>In Flight catering:</b> SARAO does not have a specific requirement for In Flight catering (State minimum service provided)	Optional		
REQ41	<b>En Route Diversions &amp; Delays due to Weather:</b> It is acknowledged that air traffic delays and diversions due to poor weather are beyond the Service Provider's control. SARAO agrees to reasonable additional Flight time costs, <b>only</b> for additional distance travelled but <b>not</b> any other costs	Mandatory		
REQ42	<b>En Route Changes or Delays due to Legislative Requirements:</b> Any changes due to legislative requirements which results in additional costs shall <b>not</b> be payable by SARAO for the route defined in REQ17 and REQ18 and it shall be the responsibility of the Service Provider to complete the flight to the required destination.	Mandatory		
REQ43	<b>En Route Changes or Delays due SARAO Requests:</b> SARAO will not normally request or not allow En Route changes, but under special circumstances when requested, SARAO shall be responsible for reasonable additional costs for such En Route changes	Mandatory		
REQ44	<b>En Route Changes or Delays due to Un-serviceability of Aircraft:</b> Any changes due to un-serviceability of aircraft shall <b>not</b> result in any additional cost for SARAO, including aircraft repairs and/or alternative aircraft and it shall be the responsibility of the Service Provider to complete the flight to the required destination	Mandatory		
REQ45	<b>En Route Changes or Delays due to Aircraft, Crew Or Passenger Safety Issues:</b> Any changes due to aircraft, crew or passenger safety issues shall <b>not</b> result in any additional cost for SARAO and it shall be the responsibility of the Service Provider to complete the flight to the required destination	Mandatory		

## 2.6 KAROO RADIO OBSERVATORY AIRFIELD ARRIVAL/DEPARTURE REQUIREMENTS

Req No	Description	Type	Compliance	Compliance Remarks
REQ46	<b>Conditions of Karoo Radio Observatory Airfield:</b> SARAO will maintain the runway, the service provider remains responsible for ensuring the runway is clear prior to landing or taking off	Mandatory		
REQ47	<b>Aircraft Safety at Karoo Radio Observatory Airfield:</b> SARAO shall not be responsible/liable for Aircraft safety/security and it shall <b>not</b> influence the service availability and <b>not</b> result in additional costs for SARAO	Mandatory		
REQ48	<b>Ground Handling at Karoo Radio Observatory Airfield:</b> SARAO shall not be responsible for Ground Handling issues and it shall <b>not</b> influence the service availability and shall <b>not</b> result in additional costs for SARAO	Mandatory		
REQ49	<b>Availability of Fuel at Karoo Radio Observatory Airfield:</b> No fuel is available at <b>Karoo Radio Observatory Airfield</b> and it shall <b>not</b> influence the service availability and shall <b>not</b> result in additional costs for SARAO	Mandatory		
REQ50	<b>Flight Crew on ground:</b> The Flight Crew will be transported from the Karoo Radio Astronomy Airfield by SARAO and accommodated at the Losberg Site Complex which is located at Losberg approx. 80km from Carnarvon. Facilities include self-help kitchen, clean bathrooms, air-conditioned lounge area and Satellite phones, Internet connection and when available comfortable sleeping rooms  When available SARAO shall be able to provide transportation between Losberg, Klerefontein Support Complex and Carnarvon  <b>Please note no cellphone reception is possible at the Losberg Site Complex</b>	Mandatory		

## 2.7 PROCEDURES FOR AIRCRAFT USING THE KAROO RADIO OBSERVATORY AIRFIELD

### 2.7.1 Karoo Radio Observatory Airfield General Procedures

Req No	Description	Type	Compliance	Compliance Remarks
REQ51	<p><b>Procedures for aircraft approaching the Karoo Radio Observatory Airfield:</b></p> <p>No aircraft, under any circumstances, shall approach any Radio Telescope Receptor to within a distance of 5NM (10km) unless:</p> <ol style="list-style-type: none"> <li>1) The flight has been authorized and scheduled by SARAO</li> <li>2) SARAO Telescope Operations are aware of the aircraft's pending arrival and have taken precautionary measures pertinent to Radio Telescope Receptor 'turn away' actions as defined below</li> <li>3) The aircraft has taken precautionary measures pertinent to aircraft navigation system restrictions as defined below</li> </ol>	Mandatory		
REQ52	<p><b>Flight Profiles</b></p> <p>The prescribed flight profiles<sup>1</sup> for aircraft approaching from CPTN or Lanseria are included in Appendix A taking into consideration the prevailing wind directions (i.e. NW/SE).</p> <p>Aircraft shall also follow these flight paths on departure.</p>	Mandatory		
REQ53	<p><b>Strong Aircraft Based Transmitters</b></p> <p>Aircraft pilots shall ensure that their aircraft's tracking devices, onboard WIFI, DME interrogators and IFF/TCAS transponders are switched off (electrical supply disconnected by re-settable breakers) at a distance of no less than 20NM (36km) from the Karoo Radio Observatory Airfield. (This equipment shall remain Off while the aircraft is on the ground and only be re-activated after take-off at a distance exceeding 20NM (36km) from the Karoo Radio Observatory Airfield)</p>	Mandatory		

<sup>1</sup> The term 'profile' is specifically used as opposed to 'track' because the altitude of the aircraft is not specified. The latter is left to pilot discretion and is not prescribed

## Commercial In Confidence

Req No	Description	Type	Compliance	Compliance Remarks
REQ54	<b>Aircraft Weather Radar<sup>2</sup></b> Aircraft pilots shall ensure, should conditions be favourable to allow this, to put their weather radar to 'Standby' at a distance of no less than 20NM (36km) from the Karoo Radio Observatory Airfield. This equipment shall remain off while the aircraft is on the ground	Mandatory		
REQ55	<b>Landing Authorisation</b> Aircraft not able to comply with REQ51 to REQ53 above shall not be authorized to land at the Karoo Radio Observatory Airfield. Under the latter circumstances, the aircraft, if airborne, shall route to Carnarvon airstrip	Mandatory		
REQ56	<b>Actions Prior to Departure</b> Prior to aircraft departure to the Karoo Radio Observatory Airfield, pilots shall contact SARAO Telescope Operations telephonically (021 506 7310) to confirm the following: 1) Intended departure time 2) Estimated Time of Arrival (ETA) 3) Based on prevailing wind speed and direction at Losberg, his/her intended landing approach (i.e. 'Landing runway 33' or 'Landing runway 15')	Mandatory		

<sup>2</sup> Pilots shall not be restricted in the use of their weather radar prior to and after take-off



## Commercial In Confidence

## 2.7.2 Karoo Radio Observatory Airfield Aircraft Approach Procedure

Req No	Description	Type	Compliance	Compliance Remarks
REQ57	The pilot shall follow the inbound flight profiles as defined in Appendix A unless Safety of Flight will be affected.	Mandatory		
REQ58	<p>Personnel arriving at the Karoo Radio Observatory Airfield shall be instructed to turn off all electronic equipment at top-of-descent and prohibited from switching on electronic equipment thereafter.</p> <p>This includes, but is not limited to;</p> <ul style="list-style-type: none"> <li>• No cellular telephones, WIFI, Bluetooth, 2-way radios or other wireless devices</li> <li>• No camera equipment or other electronics</li> <li>• No smart watches</li> <li>• No tracking devices such as apple airtags, etc.</li> </ul>	Mandatory		
REQ59	The SARAO Telescope Operator shall turn the MeerKAT Radio Telescope Receptors away when the approaching aircraft is at a distance of not less than 15NM (27km) from the Karoo Radio Observatory Airfield	Procedural info Only	N/A	
REQ60	<p>In the event, for whatever reason, that no contact could be made between the Site Telescope Operator and the Pilot prior to departure, the SARAO Telescope Operator shall:</p> <ol style="list-style-type: none"> <li>1) Assume that the aircraft has departed and is heading the Karoo Radio Observatory Airfield</li> <li>2) Turn the MeerKAT Radio Telescope Receptors away no later than 30 minutes prior to the expected time of arrival (ETA). ETA shall be assumed to be 08h30hrs Local Time</li> </ol>	Procedural info Only	N/A	

## Commercial In Confidence

## 2.7.3 Karoo Radio Observatory Airfield Aircraft Depart Procedure

Req No	Description	Type	Compliance	Compliance Remarks
REQ61	Pilots shall follow the outbound flight profiles as defined in Appendix A unless Safety of Flight will be affected.	Mandatory		
REQ62	Prior to departure from the Karoo Radio Observatory Airfield, pilots shall inform SARAO Telescope Operations telephonically (021 506 7310) of the intended take-off time	Mandatory		
REQ63	The aircraft shall take-off only once the MeerKAT Radio Telescope Receptors 'turn away' procedure has been completed and that this has been confirmed by SARAO Telescope Operations telephonically (021 506 7310)	Mandatory		
REQ64	Prior to departure from the Karoo Radio Observatory Airfield, aircraft pilots shall ensure that the aircraft's tracking devices, onboard WIFI, DME and IFF/TCAS systems remain disconnected during pre-flight checks	Mandatory		
REQ65	The MeerKAT Radio Telescope Receptors shall remain in this position until the aircraft has opened to a distance of at least 15NM (27km) from the Karoo Radio Observatory Airfield position	Procedural info Only	N/A	
REQ66	After take-off, the pilot shall only re-activate his DME and IFF/TCAS systems when at a distance of greater than 20NM (36km) from the Karoo Radio Observatory Airfield position	Mandatory		

**APPENDIX A – PRESCRIBED AIRCRAFT APPROACHES/DEPARTURES TO/FROM THE KAROO  
RADIO OBSERVATORY AIRFIELD**

## Commercial In Confidence

**1 OVERVIEW**

The SKA radio telescope site is a radio sensitive area.

Aircraft emissions disturb telescope operations and destroy expensive receiver equipment.

**2 SAFETY OF LIFE**

To protect the SKA telescope and operations the following procedures are provided, however safety of life takes precedence over any procedure documented here.

**3 INSTRUCTION TO PASSENGERS**

No electronic equipment permitted on Site without an SKA RFI control permit.

No cellphones (including flight mode), smart watches, cameras, tablets, laptops, radios etc.

**4 AIRCRAFT TRANSPONDERS / DME**

Pilots shall switch off DME and Transponders within a distance of 20NM from site.

Where possible weather radar shall remain off within a distance of 20NM from site.

Where installed, onboard WIFI should be switched off within a distance of 20NM from site.

**5 APPROACH AND DEPARTURE WAYPOINTS**

No flying directly overhead any Antenna.

The approach and departure waypoints below are to be used for all flights.

A single 'approach point' for either direction (15/33) is to be used by both CPT and JHB flights. The approach point for one end is also the 'departure point' for the other end of the runway.

Waypoint	Description	Latitude		Longitude	
		Lat (D M S)	(D M.m)	Long (D M S)	(D M.m)
SKA15	Approach to RWY 15	30°39'16"S	30° 39.27' S	21°22'06"E	21° 22.10' E
SKA15F	0.5NM final RWY 15	30°40'58"S	30° 40.97' S	21°26'30"E	21° 26.50' E
VR041	Runway (Apron)	30°41'38"S	30° 41.63' S	21°27'40"E	21° 27.67' E
SKA33F	0.5NM final for RWY 33	30°41'58"S	30° 41.97' S	21°28'16"E	21° 28.27' E
SKA33	Approach to RWY 33	30°47'02"S	30° 47.03' S	21°32'52"E	21° 32.87' E

**6 COMMUNICATION TO TELESCOPE OPERATIONS**

Prior to departure to/from site, pilots shall radio or telephone Operations (on 021 5067310) to state:

1. Intended departure/arrival time
2. Intended departure/arrival runway.

---

# Prescribed Aircraft Approaches/Departures To/From the Karoo Radio Observatory Airfield

## Approach and Departure Waypoints

- ✈ Waypoint SKA15
- ✈ Waypoint SKA15F
- ✈ Waypoint VR041
- ✈ Waypoint SKA33F
- ✈ Waypoint SKA33
- ↪ Line 6
- ↪ Line 7
- 🏠 Losberg Site Office
- ↪ Runway Extended Line, South East
- ↪ Runway Extended Line, North West



Figure 2 - Prescribed Aircraft Approaches/Departures To/From the Karoo Radio Observatory Airfield











# SSA0000-0000V1-01 RS Rev 3 - Air Charter Scope of Services

Final Audit Report

2023-09-28

Created:	2023-09-27
By:	Roger Young (ryoung@sarao.ac.za)
Status:	Signed
Transaction ID:	CBJCHBCAABAAul6jS0drPZx3dv6pSxbWUFnmlQNL3Rr_

## "SSA0000-0000V1-01 RS Rev 3 - Air Charter Scope of Services" History

-  Document created by Roger Young (ryoung@sarao.ac.za)  
2023-09-27 - 11:41:39 GMT- IP address: 105.242.168.58
-  Document e-signed by Roger Young (ryoung@sarao.ac.za)  
Signature Date: 2023-09-27 - 11:43:42 GMT - Time Source: server- IP address: 105.242.168.58
-  Document emailed to Darrel Liebenberg (darrel@sarao.ac.za) for signature  
2023-09-27 - 11:43:44 GMT
-  Email viewed by Darrel Liebenberg (darrel@sarao.ac.za)  
2023-09-27 - 11:43:52 GMT- IP address: 13.244.163.118
-  Signer Darrel Liebenberg (darrel@sarao.ac.za) entered name at signing as DLiebenberg  
2023-09-28 - 06:42:48 GMT- IP address: 196.24.39.242
-  Document e-signed by DLiebenberg (darrel@sarao.ac.za)  
Signature Date: 2023-09-28 - 06:42:50 GMT - Time Source: server- IP address: 196.24.39.242
-  Document emailed to cgumede@sarao.ac.za for signature  
2023-09-28 - 06:42:51 GMT
-  Email viewed by cgumede@sarao.ac.za  
2023-09-28 - 06:42:58 GMT- IP address: 13.244.163.118
-  Signer cgumede@sarao.ac.za entered name at signing as scgumede  
2023-09-28 - 07:21:44 GMT- IP address: 196.24.39.242
-  Document e-signed by scgumede (cgumede@sarao.ac.za)  
Signature Date: 2023-09-28 - 07:21:46 GMT - Time Source: server- IP address: 196.24.39.242

✔ Agreement completed.

2023-09-28 - 07:21:46 GMT



**Adobe Acrobat Sign**