



SOUTH AFRICAN NATIONAL SPACE AGENCY (SANSA) SPACE OPERATIONS

Request for Information (RFI) For

**FREE SPACE OPTICS (FSO) LINKS BETWEEN THE HBK MAIN BUILDING,
GENHOUSE AND THE VILLAGE IN A RING TOPOLOGY**

RFI No.: RFI SO/001/09/2025

Request for Information Issue Date: **08 September 2025**

Request for Information Due Date: **23 September 2025**

1. INTRODUCTION

The South African National Space Agency (SANSA) was established by an Act of Parliament – SANSA Act 36 of 2008. SANSA's mandate is to provide for the promotion and use of space and cooperation in space-related activities, foster research in space science, advance scientific engineering through human capital and support the creation of an environment conducive to industrial development in space technologies within a framework of national government policy.

Furthermore, SANSA has a legislative mandate to develop the space industry in South Africa.

The South African National Space Agency (SANSA) hereby invites information from established and reputable service providers for the potential deployment of a Free Space Optics (FSO) solution at the Haartebeeshoek (HBK) facility. The envisaged solution should provide redundant communications link interconnecting the HBK Main Building, the Genhouse, and the Village in a ring topology. Through this Request for Information (RFI), SANSA seeks to understand available solutions that can deliver reliable connectivity, ensure redundancy, and effectively support its operational requirements. Interested service providers are invited to submit detailed information on their capabilities, relevant experience, and potential solution offerings in response to this RFI.

This RFI is issued as a means of technical discovery and information gathering only and aims to determine work scope and indicative costing. This RFI is not an invitation to pre-qualify prospective contractors and participation is voluntary. Furthermore, all the information provided may be used for planning purposes and is none binding on either party.

2. BACKGROUND

SANSA is exploring the deployment of a Free Space Optics (FSO) solution in a ring topology interconnecting the Main Building, Genhouse, and Village. This high-capacity, low-latency, and redundant communication system will serve as the backbone for smart metering solutions that enable real-time monitoring of energy use, sustainable resource management, and enhanced operational intelligence, aligned with international RAMS standards.

This RFI is issued solely for information gathering and planning purposes; this RFI does not constitute a formal solicitation for proposals. Note that responses to this RFI will be kept strictly confidential and used only for topic development for future in support of the South African space engineering industry sector.

3. INFORMATION REQUESTED

All information shall be submitted in accordance with the instructions provided in this document. Classified responses will not be accepted.

SANSA request that respondents assess the requirements as stated in Annexure A of this RFI and submit proposals for solutions that they are able to provide. The proposals should address the technical solution concepts and scope, implementation plan and timeline, risk aspects, assumptions made, expected customer supplied items and interfaces, long lead items, and any relevant SHEQ aspects.

4. RFI INQUIRIES

Inquiries to this RFI must be submitted to spaceops-scm@sansa.org.za. No telephone inquiries will be accepted. SANSA will review queries and if relevant post responses on the SANSA website in the RFI site. Queries must be submitted before **23 September 2025** to be considered by SANSA for a response.

5. SUBMISSION INSTRUCTIONS

Responses to this RFI are due **no later than 16:00, on 23 September 2025**. All submissions must be electronically submitted to spaceops-scm@sansa.org.za, as a PDF file attachment not to exceed 10MB. The information provided in response to this RFI will not be disclosed publicly.

The information is requested for planning purposes only. The release of the RFI does not indicate that SANSA will issue a solicitation, nor does it obligate SANSA to invest any resources specific to the targeted system areas declared in the responses to this market research activity.

A voluntary site visit shall be attended by respondents for the **15th of September 2025 at 10:00AM** at the Haartebeeshoek (HBK) site, SANSA Space Operations Office, Farm 502 JQ, West Rand District. Although all responses will be considered, it is highly recommended that respondents attend due to the uniqueness of the site. All respondents are to indicate their attendance by no later than 15 September 2025 to spaceops-scm@sansa.org.za

SANSA may request respondents to present their proposal after the submissions have been assessed.

6. DISCLAIMERS AND IMPORTANT NOTES

This RFI is issued solely for information gathering and planning purposes; this RFI does not constitute a formal solicitation. Respondents are advised that SANSA is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI.

Responses to this RFI are not offers and cannot be accepted by SANSA to form a binding contract. Respondents are solely responsible for all expenses associated with responding to this RFI. SANSA will not provide reimbursement for costs incurred in responding to this RFI. It is the respondent's responsibility to ensure that the submitted information has been approved for public release by the information owner.

SANSA does not intend to award a contract on the basis of this RFI or to otherwise pay for the information solicited, nor is SANSA obligated to issue a solicitation based on responses received. Neither proprietary nor classified information should be included in the submittal.

ANNEXTURE A: FREE SPACE OPTICS (FSO) LINKS BETWEEN THE HBK MAIN BUILDING, GENHOUSE AND THE VILLAGE IN A RING TOPOLOGY

1. PROBLEM STATEMENT / PURPOSE

SANSA is seeking information from established service providers who can deliver a Free Space Optics (FSO) solution to interconnect the HBK Main Building, Genhouse, and Village in a redundant ring topology. The FSO system is expected to provide reliable, low-latency, and highly available communications to support smart metering solutions that enable real-time monitoring of energy and water consumption, improved efficiency, and sustainable resource management, alongside broader facility coordination.

2. SCOPE OF WORK

The scope of work requires the bidder to provide a complete turnkey FSO solution. This includes the execution of a site survey to confirm line-of-sight feasibility, planning and design to define link budgets and integration requirements, installation and alignment of FSO terminals, commissioning and testing to ensure performance compliance, and a formal handover with complete documentation. Furthermore, the contractor will provide ongoing maintenance and support services to guarantee long-term reliability and availability.

SYSTEM REQUIREMENTS

The FSO system must be deployed in a ring topology connecting the HBK Main Building, Genhouse, and Village to ensure redundancy and failover in the event of a single link disruption. Each link must provide a minimum throughput of 10 Mbps in full duplex mode, with scalability to 100 Mbps, and achieve latency below 5 microseconds. The solution must maintain a minimum link margin of 3 dB under standard weather conditions, with a target annual availability of 99.9 percent. To enhance reliability, the system must incorporate adaptive power control, auto-alignment mechanisms, and mitigation strategies against rain fade and fog. Ethernet handoff shall be provided via Fast Ethernet (FE) ports, with VLAN, QoS, and SNMPv3 support for monitoring and management.

SCOPE OF SERVICES

The site survey will confirm line-of-sight clearance, identify potential obstructions, assess rooftop or tower mounting options, and evaluate environmental conditions such as fog, rain, dust, and lightning risks.

Planning and design will include detailed link budget calculations, CAD layout drawings, integration planning with the SANSA network, and redundancy definition, all of which must be approved before installation. Installation activities will involve the supply and secure installation of FSO terminals, mounts, power supplies with UPS integration, and precise alignment of optical beams.

Commissioning will consist of full throughput, latency, and error rate testing, the delivery of as-built diagrams, and training for SANSA technical staff, culminating in a formal acceptance handover.

Maintenance and support will be provided through a three-year SLA covering preventive inspections every six months, fault response within four hours for critical incidents and within twenty-four hours for non-critical faults, and spare part availability within forty-eight hours.

STANDARDS AND COMPLIANCE

The solution shall comply with relevant international standards including IEC 60825-1 for laser product safety, ITU-T G.826 for error performance monitoring, EN 50126 for RAMS (Reliability, Availability, Maintainability, and Safety), and shall be supplied by an ISO 9001 certified vendor.

DELIVERABLES

Key deliverables include the site survey report, the detailed design and link budget documentation, as-built drawings, commissioning and test results, the operations and maintenance manual, and a training report with attendance records. These deliverables will ensure that SANSA has the necessary documentation for both operational and compliance purposes.

ACCEPTANCE CRITERIA

Acceptance of the solution will be based on demonstrated throughput of at least 10 Mbps on all links, latency of less than 5 microseconds, and verification of 99.9 percent availability using weather models. Ring redundancy must be

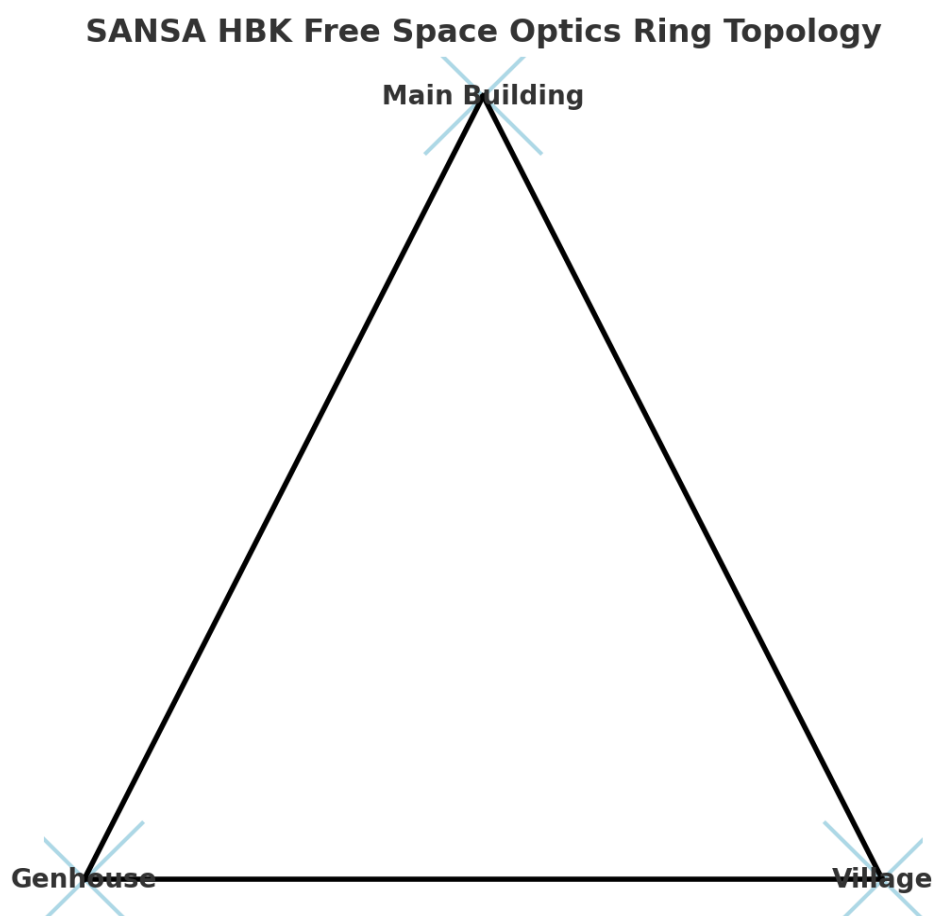
validated through automatic failover testing, and all documentation must be reviewed and approved before final sign-off.

MAINTENANCE SCHEDULE

The preventive maintenance schedule requires monthly visual inspections of terminals and mounts to detect physical damage or alignment issues, quarterly system performance testing to verify throughput, latency, and error rates, and semi-annual alignment checks with cleaning of optical surfaces. An annual system audit will be conducted, including firmware and software updates as well as the replacement of worn components. Corrective maintenance will be performed as required, with critical faults addressed within four hours and non-critical faults within twenty-four hours, as defined by the SLA.

NETWORK TOPOLOGY DIAGRAM

The following diagram illustrates the proposed Free Space Optics (FSO) ring topology connecting the HBK Main Building, Genhouse, and Village at SANSA HBK.



BILL OF QUANTITIES OF SCOPE OF SERVICES

	SERVICE ACTIVITY	QUANTITY/DURATION	PRICE (ZAR)
1.	Site Survey and Environmental Assessment	1 Lot	
2.	Planning and Design Documentation	1 Lot	
3.	Installation and Alignment of FSO Links	3 Links	
4.	Commissioning and Testing	1 Lot	
5.	Training of SANSA Technical Staff	2 Sessions (Operations and Maintenance)	
6.	O&M Documentation Delivery	1 Lot	
7.	Preventative Maintenance (3 years SLA)	6 visits (Semi-Annual)	
8.	Maintenance & Support (3 years SLA)		
9.	Corrective Maintenance Support	As and when required	
10.	Others:		



BILL OF QUANTITIES OF MATERIAL

	ITEM DESCRIPTION	QUANTITY	PRICE (ZAR)
1.	FSO Transceiver Terminals (≥ 1 Gbps, scalable to 10 Gbps)	3 pairs (6 units)	
2.	Mounting brackets & weatherproof housings	6 sets	
3.	Fiber patch cords & SFP/SFP+ modules	6 sets	
4.	UPS & Surge Protection Units	3 units	
5.	Network Switches with VLAN/QoS support	3 units	
6.	Installation accessories (cables, grounding, fixtures)	Lot	
7.	Monitoring & Management Software (SNMPv3)	1 license	
8.	Others:		

COMPLIANCE WITH PROTECTION OF PERSONAL INFORMATION ACT, 2013 (ACT NO. 4 OF 2013) (“POPIA”)

1. The Constitution guarantees citizens the right to privacy, including the right not to have the privacy of their communications infringed.
2. POPIA aims to promote the protection of privacy through the application of its guiding principles for the processing of personal information in a context-sensitive manner.

Committed to your Privacy

3. SANSA fully comprehends that your personal and company information is valuable to you; your privacy is important to SANSA. SANSA commits to safeguarding and lawfully processing your personal information.

Purpose for Processing your Personal Information

4. SANSA collects, holds, uses and discloses your personal information mainly to provide you with access to its services. SANSA will only process your personal information for a purpose you would reasonably expect, including:
 - Complying with any legal and regulatory requirements such as contract agreements, etc.
 - Confirming, verifying and updating your details.
 - Invoicing or paying you to ensure payment and tax compliance.
5. SANSA may collect your personal information which may include your first name and last name, company name and its registration number, identity numbers, email address, physical or postal address, other contact information, banking details, etc.

Consent to Disclose and Share your Personal Information

6. SANSA may need to share your personal information, with third parties, to provide advice, and/or services. Where SANSA shares your personal information, it will take all reasonable precautions to ensure that the third party will treat your personal information with the same level of protection as required by SANSA.

Request and Access to your Personal Information

7. Should you require further information on this or have any concerns about how your personal information is processed or used, you can contact SANSA's Information Officer on popi_paia@sansa.org.za.



8. You can request access to the personal information SANSA has on you at any time. If you think that SANSA has outdated information, you may request to update or correct it. You can also opt-out and request the removal of your personal information at any time. If there are any lawful reasons for requiring SANSA to retain any information, SANSA will advise so.
9. **PLEASE TAKE NOTE** that your personal information is securely hosted on infrastructure / system managed by SANSA. SANSA assures you that your information will not be shared for any marketing or promotional purposes without your consent.
10. SANSA will continue to manage, monitor, refine and develop policies, processes and systems. This will ensure that SANSA takes every practical and reasonable step(s) to ensure data protection, is in line with POPIA.