TERMS OF REFERENCE (TOR) FOR ENHANCED NON-INTRUSIVE INSPECTION (NII) SOLUTION FOR LAND BORDERS

EXECUTIVE SUMMARY

This document outlines the Terms of Reference (TOR) for the Enhanced Non-Intrusive Inspection (NII) Solution for Land Borders and Other Points of Entry. The Kenya Revenue Authority (KRA) seeks to address critical capacity and technology gaps in its cargo and baggage scanning infrastructure through the procurement of scanners, modern Non-Intrusive Inspection (NII) systems and establishment of command centres.

The initiative aims to combat illicit trade, reduce tax evasion, enhance revenue collection, alleviate congestion at border points, and strengthen national and supply-chain security. The Key Objectives are to Increase operational efficiency at points of entry/exit, enhance detection of contraband, mis-declaration and concealed goods, boost revenue collection and national security, reduce cost of doing business through faster clearance and provide robust enforcement and centralized monitoring capabilities

The project comprises the supply, delivery, civil works, installation, commissioning, integration, training, and full maintenance and support (including all spares, software updates and consumables) of 21 new scanners (8 Drive-through cargo scanners, 4 Mobile cargo scanners, 4 CT baggage/palletized cargo scanners, 3 Bus scanners, 2 Car/small-vehicle scanners and 17 Radiation Portal Monitors (RPMs), 2 command centres for containerized cargo scanners, 2 command centres for CT baggage/palletized cargo scanners with associated CCTV network infrastructure and power back-up systems.

1. BACKGROUND

The Kenya Revenue Authority (KRA) has deployed scanning technology at the identified key points of entry (POE's) and heightened collaboration with other partner government agencies with a view to combat illicit trade at these entry/ exit points. The points of entry where scanners have been installed include the port of Mombasa, Inland Container Depot Nairobi (ICDN), Jomo Kenyatta International Airport (JKIA), Malaba One Stop Border Post (OSBP), Busia OSBP and other Airports and Land Borders. The scanners have further been integrated to a centralised Command & Control Centre, utilising the Integrated Scanner Management System (iScan), from where all the scanner images are analysed and electronically availed to the release points.

KRA intends to acquire additional cargo and baggage scanners for installation and integration to address the current shortage and enhance monitoring from the centralised Command & Control Centre. The shortage is both capacity-wise and technology-wise. Significant increase in cargo volumes at the POE's has caused the scanners to be overwhelmed hence leading to frequent cases of congestion, this is further complicated by lack of backup arrangements when the existing scanners experience downtimes. Further to this, many POE's with significant traffic have not been facilitated with drive-through cargo scanners, these include Lungalunga, Taveta, Oloitokitok, Namanga, Isebania, Lwakhakha, Suam and Moyale among others. Seven (7) JKIA Transit Sheds which handle significant volumes of cargo have not been facilitated with scanners to handle imports. All these shortages not only pose National Security risks but also revenue and trade facilitation risks. All these necessitate urgent enhancement of KRA's cargo and baggage capacity to close the existing gaps.

Besides the capacity shortages, the rapid advancement of technology has rendered many of the current scanners outdated and some obsolete. It is necessary for KRA to utilise modern Non-Intrusive Inspection (NII) technologies to ensure they achieve the maximum gains from the investments. By leveraging modern state-of-the-art technologies, the Authority will be able to reduce tax evasion and therefore increase revenue collection, which is often hindered by mis-declaration and concealment of cargo on imported/exported containerised goods and attempts to smuggle contraband through passenger baggage. This is in addition to assurance of National Security by utilising modern technologies with capabilities of automatically identifying profiled threats.

2. OBJECTIVES FOR ENHANCED NII SOLUTION FOR LAND BORDERS:

i. Increased operational efficiency at points of entry/exit
ii. Enhancement of contraband detection capability
iii. Enhance revenue collection
iv. Improvement of national and supply chain security
v. Enhanced enforcement capability
vi. Reduced cost of doing business

3. EXPECTED DELIVERABLES FOR THE NII SOLUTION:

i. Hardware Components:

a) Drive through cargo scanners - 8
b) Mobile cargo scanners – 4
c) CT Baggage Scanners – 4

d) Car scanners – 2

e) Bus scanners – 3

f) Radiation portal monitors – 17

g) Supply and installation of network infrastructure to support acquisition and transmission of Scanner Images and CCTV footage.

ii. Command Centers:

a) Cargo scanner command center – 2

b) Baggage scanner command center – 2

c) Image analysis workstations for cargo scanner command centers – 60 (30 for each)

d) RPM workstations for cargo scanner command centers – 20 (10 for each)

e) Workstations for the baggage/palletized scanner command center – 60 (30 for each)

iii. Software NII Solutions Within the Scanners:

a) Scanner Controlling System (SCS): Software for operating the scanner.

b) **Image Processing System (IPS)**: Custom software for processing scanned images.

c) **Data Management Systems**: Software for storing, managing, and retrieving scanned data and images, with secure access for authorized personnel.

d) **CCTV Management System:** For managing acquisition, sharing storage and retrieval of CCTV footage from the scanner site.

e) **AI/ML System:** For automated detection of preprogrammed items.

iv. Application Programming Interface (API): Seamless integration with existing customs and border control databases and systems for efficient data sharing and processing. **Centralized NII Software Solutions:**

a) **Integrated Cargo Scanner Management System:** For integrating all cargo scanners for centralized image analysis from Command Centers and accessibility of images at release points.

b) **Integrated Baggage & Palletized Scanner Management System:** For monitoring and managing analysis of baggage scanner and palletized scanner images from a centralized locations and overseeing the operations.

c) **Centralized Image Analysis System:** For analyzing images from a centralized location. The system should support analyzing images from different vendors.

d) **Image Analysis and Scanner Operation Training System:** Training programs for operators and maintenance personnel to ensure they can effectively use and maintain the scanners.

e) **Image Library System:** The system will store known images with proper identification, HS Codes, etc. for easy of reference and training the AI solution.

f) **Reporting and Data Analytics Software:** Implementation of reporting and analytics tools to monitor scanner performance and generate insights for continuous improvement.

g) **AI/ML System:** For Automated Case/Image Inspection utilizing the typical image library knowledge, risk management and valuation tools.

v. Central Alarm System: The system manages the radiation portal monitors.

vi. Other NII Deliverables

a) **Testing and Calibration:** Rigorous testing and calibration of the scanners to ensure they meet performance and safety standards.

b) **Documentation:** Comprehensive documentation, including user manuals, maintenance guides, and safety protocols.

c) **Operational Readiness:** Final checks and readiness assessments to ensure the scanners are fully operational and integrated into the security infrastructure.

d) **Repairs, Maintenance & Support:**

1 **Repairs, Maintenance & Support Plans**: Maintenance and technical support plans to ensure the continued operation and reliability of the scanning systems. The maintenance plans will be guided by Service Level Agreements (SLA) which will be part and parcel of the project.

2 **Spare Parts and Supplies**: Provision of spare parts shall be part and parcel of the Repairs, Maintenance and Support arrangement which shall be established.

3 **Software Updates, Fixes and Enhancements:** This shall be part and parcel of repairs, maintenance and support.

e) **Compliance and Regulatory Requirements:**

1 **Regulatory Compliance**: Ensure that the scanning systems and processes comply with relevant international and national regulations and standards for customs and border control.

2 **Security and Privacy**: Implement measures to protect the security and privacy of scanned data, in accordance with data protection laws and regulations.

vii. Capacity Building, Training and Handholding

a) Image Analysis
b) Scanner operations
c) Radiation safety
d) Central Alarm System (CAS)
e) Database support/maintenance training and handholding for six (6) months
f) Application support/maintenance training and handholding for six (6) months
g) Training of Trainers in the manufacturer's factory (ToT)

4. SCOPE OF WORK:

The scope of the project will comprise the following:

a) Supply, installation and commissioning of 21 scanners in the identified critical ports of entry as per the schedule of requirements. Integration of the 21 supplied scanners to the iScan system. CCTV integration for the 21 supplied scanners to the command centers.
b) Establishment of 2 command and control centers for containerized cargo image analysis and monitoring of cargo scanner operations. Provision of thirty (30) work stations for each command center. Integration of the 2 command centers to the iScan system.
c) Supply and installation of a primary and back-up command centers for centralized monitoring of baggage and palletized scanners (existing and those to be supplied). Integration (For viewing both images and CCTV) of the baggage and palletized scanners (Existing and those to be supplied) to the command centers.
d) Training, knowledge transfer and certification of scanner operators, image analysts and other scanner staff.
e) Supply, installation and commissioning of storage, compute resources and supporting network infrastructure as per the provided BQ and Technical Specifications.
f) Supply, Installation and Commissioning of 17 Radiation Portal Monitors at each scanner site for the drive through, mobile, bus and car scanners to be supplied.
g) Supply, installation and commission of a central alarm system infrastructure comprising data center infrastructure (primary and backup) and command center infrastructure (primary and backup). The command center infrastructure shall comprise twenty (20) work stations to be placed in the cargo scanner command centers (10 for each command center). Integration of Radiation Portal Monitors (Existing and those to be supplied) to the central alarm system for centralized

management from command centers. A site survey for existing radiation portal monitors shall be conducted to before bidding.

5. METHODOLOGY

The vendor should clearly demonstrate a comprehensive understanding of the Terms of Reference (TOR) and all outlined requirements for the Supply, Delivery, Installation and Commissioning of scanners, non-intrusive systems and establishment of scanner command centres. In addition, they should present a well-defined delivery methodology that explains how they intend to execute the assignment.

6. SCANNER PROCUREMENT GUIDELINES

Following are the guidelines for procurement of scanners:

a) Warranty and Maintenance

The vendor shall provide a warranty for three (3) years and maintenance service for seven (7) years for the scanners, accessories and associated systems, hardware and other installations. The warranty and maintenance shall cover support, repair, maintenance and any other required deliverables to ensure smooth and seamless performance of the scanners for the warranty duration. The warranty and maintenance shall include parts, labour, material and any other accessories required to ensure smooth operation of the scanners.

b) Delivery and installation expenses

The vendor shall be responsible for all delivery expenses including shipping, transportation, civil constructions and installation of the scanners at the client's premises. The vendor shall deliver and client shall acknowledge delivery and installation of the scanner after inspection and testing to confirm that the scanner is working satisfactorily in every respect.

c) Taxes

The vendor shall pay all import, sales, use or other taxes that may be imposed on either party as a result of this transaction. The vendor shall indemnify, defend and hold the client, employees and agents harmless from all liabilities, suits, judgments, obligations, fines, penalties, claims, costs, and expenses (including reasonable legal fees) arising out of the imposition of any such tax on the client. The vendor shall be responsible for paying all taxes associated with spare parts shipped throughout the warranty period.

d) Work permits and Access Passes

The vendor shall ensure they provide work permits for their local employees/technicians and meet all fees and charges required to provide such documents from time to time to the relevant agencies. These include all the vendor personnel, contractors and subcontractors on both short term and long term engagements. The vendor will ensure timely applications and the established laws and procedures to ensure their personnel are facilitated effectively and timely their services meet the client's SLA requirements.

e) Compliance with Kenya Nuclear Regulatory Agency (KNRA) & other laws and safety of the users

The vendor shall comply with KNRA requirements and all other laws governing the use of scanners in the Republic of Kenya. The vendor shall ensure that Radiation surveys are carried out regularly and reports submitted to KRA. The vendor shall supply safety devices including dosimeters for the use of staff working in the scanner site, be responsible for the safety of all staff, agents and stakeholders who access the scanner area. The client may at their discretion conduct independent and parallel radiation monitoring to their satisfaction. In cases involving mobile scanners or scanners which need defining a radiation boundary, the vendor shall be responsible for marking the radiation area using a chain link and any other additional requirements to ensure the radiation area is clearly identified.

f) Disposal

The vendor shall upon obsolescence and decommissioning of the scanner remove the scanner from the client's premises at own cost and be responsible for its disposal in line with the laws and regulations of Kenya Nuclear Regulatory Authority (KNRA).

g) Service Level Agreement

The parties shall enter into a Service Level Agreement to clearly define allowed downtimes, response time, patches and updates, availability of local engineers, accidents, repair time, additional support, etc. The service level should be part and parcel of the contract.

h) Training

The Vendor shall ensure that all KRA personnel utilizing the scanner are properly trained in the use thereof. For every scanner or system supplied, the vendor shall

train the personnel deployed to operate the scanner or equipment. For subsequent deployments, the vendor shall provide client with the cost of training per head for every relevant subject area. The relevant subject areas include: Image analysis, scanner operations, radiations safety, ICT system maintenance, CAS and other relevant areas.

The client shall request different types of training to be provided to other staff members at the provided costs from time to time. The training shall include:

- Image Analysis
- Scanner operations
- Radiation safety
- Central Alarm System (CAS)
- Database support/maintenance training and handholding for six (6) months
- Application support/maintenance training and handholding for six (6) months
- Training of Trainers in the manufacturer's factory (ToT)

i) Provision of scanner site traffic marshalling and documentation services

In order to support scanner operations at the scanner sites, the client may request the vendor to provide services for marshalling and documentation from time to time. In such cases, the vendor officers shall be bound by the same laws and regulations which bind the KRA officers at a minimum besides the other laws and work instructions and procedure which shall be imposed from time to time. To actualise this, the vendor shall provide the costs per site for providing the scanner marshalling and documentation services, the costs should be proportional to the number of personnel provided per site, logistical support, protective/safety gear, radiation safety gear and prescribed uniforms as guided by KRA.

j) Integration with iSCAN

All the scanners (Cargo, palletized, baggage, etc.) must be capable of integrating with the iScan system currently in use (for sending/receiving scanner x-ray images in UFF format) and other KRA systems. The vendor shall supply to KRA ICT and technical staff of the client any information or documentation necessary for the operationalization of the integration. The client shall provide the vendor with technical integration requirements to enable the vendor to integrate with the iScan system. The vendor shall be responsible for system integration with regard to related costs, development and deployment to live after user acceptance tests by the client.

k) Ownership and handling of scanner information

The Client shall own all information processed and stored in the scanner. Servers will be under the control of KRA to safeguard information. The Vendor shall exercise confidentiality in the handling of such information and ensure the same is not divulged to other parties. The information stored in the scanner shall at the end of the contract term be retained by the Client.

l) Use of the scanning equipment

The Client shall exercise due care in its operation and use of the scanner. Client shall not use and shall not permit others to use the scanner in any manner that would contravene applicable laws, rules, regulations and other governmental directives, would violate the terms of the Vendor or would contravene the manufacturer's reasonable operational standards for the scanner.

m) Licenses and permits

The Vendor shall obtain all permits and licenses necessary for the installation, operation, possession and use of the Scanner. The Vendor shall comply with all laws, rules, regulations and other governmental directives applicable to the installation, use, and operation of the Scanner and, if compliance with such law, rule, regulation or other governmental directive requires changes or additions to be made to the Scanner, such changes or additions shall be made by Vendor at their own cost.

n) Utility Installation Charges

The Vendor shall meet all installation costs for electricity, water and other utility services to be used on or in connection with the scanner. The vendor shall conduct comprehensive site surveys and include the total costs for installing such services, factoring all requirements including cabling, ducting, manholes and all other requirements from the nearest point of presence to the scanner site.

o) Acts of commission or omission by the Vendor's employee

The Vendor shall put in place adequate measures to prevent against any revenue or other financial losses that may be suffered by the Client ensuing out of actions by employees or agents of the Vendor. The Client shall surcharge the Vendor for any acts of commission or omission by employees or agents of the Vendor that cause the Client to incur losses.

p) Indemnity

The Client shall not be responsible for any injuries, damages, penalties, claims or losses, including but not limited to legal costs and expenses, incurred by the Vendor or any other person caused by the transportation, installation, manufacture, selection, purchase, ownership, possession, repair, storage, modification, maintenance, condition, use, return or disposal of the Scanner.

q) Force majeure

The Vendor shall not be liable for delay or non-shipment resulting from acts or events beyond its reasonable control. In the event of such delay, the date of shipment shall at the request of Vendor, be deferred for a period equal to the time lost by reason of the delay and otherwise for a reasonable time.

r) Governing law and dispute resolution

The procurement shall be governed by and construed in accordance with the laws of the Kenya. The Vendor and Client agree that the courts of Kenya shall have the exclusive jurisdiction to settle any disputes, which may arise in connection with the Procurement.

s) Connection to the Kenyan grid

The equipment MUST be configured to seamlessly connect to Kenya's mains electricity.

t) Business continuity

The Vendor MUST have arrangements in place for business continuity including generators, power backup systems, etc. All costs incurred from such business continuity arrangements shall be met by the Vendor. The Vendor shall implement the power back-up such that during power outage or fluctuations the scanner operation is not interrupted at any one time.

7. EVALUATION CRITERIA

The evaluation of tenders shall be carried out in Four (4) stages as follows;

i. Tender Responsiveness/Mandatory documents
ii. Technical Evaluation
   a) Vendor Qualifications
   b) Technical Mandatory Requirements

c) Solution Simulation Demo

iii. Financial Proposal

iv. Post Evaluation/Due Diligence

A. TECHNICAL EVALUATION

The bidder will be evaluated based on the following parameters

i. Understanding of the TORs/assignment
ii. Competencies in the area of supply, installation, integration commissioning, maintenance and repairs of scanners and the supporting systems and infrastructure
iii. The bids must conform to the specific Technical Requirements as provided in the Schedules of requirements.
iv. Experience of the vendor
v. Experience of maintenance/support engineers
vi. References - Organizations of KRA size where a similar assignment was undertaken
vii. Cost

B. OVERALL EVALUATION

The bid evaluation will take into account technical factors in addition to cost factors. The weight for Technical Evaluation is 80% while Financial Evaluation will be 20%.

8. DETAILED TECHNICAL SPECIFICATIONS/ REQUIREMENTS

8.1 TECHNICAL MANDATORY EVALUATION

Instructions to Bidders:

- Bidders MUST complete the Table below in the format provided.
- Bids MUST meet all mandatory (MUST) requirements in the Tables below in order to be considered for further evaluation.
- Bidders MUST provide a substantial response or clear commitment to meeting the requirements for all features irrespective of any attached technical documents in the table format (bidders Response) below. Use of Yes, No, tick, compliant, blank spaces etc. will be considered non-responsive.
- Bidders who do not comply with any of the below requirements will NOT be considered for further evaluation

NB: Bidders who shall meet the cut-off score for the technical and demonstration requirements shall be evaluated at the financial evaluation stage.

All technical requirements will be evaluated on pass or fail basis

8.1.1 -THE MINIMUM REQUIREMENTS FOR THE BAGGAGE/PALLETIZED SCANNER COMMAND CENTRE WILL INCLUDE THE FOLLOWING (DESCRIPTION OF THE SOLUTION)

All technical requirements will be evaluated on pass or fail basis

NO.	MINIMUM REQUIREMENT	Bidder's Response
	The Scanner image shall be synchronized with the CCTV footage for the relevant scanner, showing both entry and exit areas. After the image is saved, when it is retrieved, it should have a link to the exact point of the relevant CCTV footage which can be rewound and forwarded as required.	
	Transmission of CCTV and Images from the Baggage and Palletized Scanners to command centre shall be on real-time basis.	
	A Backup command centre shall be set up for business continuity and enhanced visibility. This will ensure business continuity incase once command center is not accessible.	
	All key areas at the location of the scanners including the baggage pickup area, airside scanner, baggage inspection area, etc. shall be covered by CCTV to ensure baggage and cargo inspection is monitored end-to-end.	
	The solution will be designed in such a way such that it will be scalable to: Accommodate any other areas on interest and expansion. Integrate scanners from different manufacturers.	
	The primary storage, which shall be located in the command centre server room shall have capacity to maintain images and CCTV for at least one (1) year before writing over.	
	The furniture for the command centre shall include a table and an orthopedic chair for each workstation. A lockable pigeonhole storage unit shall be included with enough compartments for all command centre personnel. Detailed specifications shall be developed for the furniture.	
	Each workstation shall possess three (3) screens to display as follows: Screen 1: Image analysis Screen 2: CCTV footage at scanner entrance Screen 3: CCTV footage at scanner exit	
	The general CCTV monitoring areas other than entry and exit of the scanners will be monitored by a dedicated person in the command centre to detect	

	any anomalies which may include removing items from bags, putting items in bags, erasing markings on bags, etc.	
	An integration system shall be developed, delivered installed and it shall have the following capabilities: Acquire, process and store images from all types of baggage and palletized scanners from all manufactures Possess AI/ML and deep learning capabilities to automatically identify items. The AI should be able to automatically identify 70% of the items automatically and give a confidence limit for cases below 100% confidence. Able to integrate with other systems in KRA and systems belonging to other partner government agencies. The system should be capable of executing automated and random allocation of tasks	
	There will be a real time intercom system with capability to speak to all scanner operators at once or to focus on a particular scanner. The intercom should be scalable to be able to extend it to other key areas and key agencies. The scanner conveyor belts for the scanner in focus should able to be controlled from command centre.	
	Site survey for bidders shall be mandatory before quoting to determine the quantities of: Trunking, cable, Number switches needed, number and type of cameras needed, etc.	
	The integration system should be able to scan the baggage tags for risk profiling utilizing relevant sources of information.	
	The system should meet KRA's minimum ICT system requirements.	
	The integration system should have Threat Image Projection (TIP). The system should also have a training module complete with a database of images, training notes, examinations, etc., the training should enable the learners to get the Kenya Civil Aviation Certificate (KCA) certificate.	
	The command centres shall run on clean power, the vendor shall provide a power backup system able to provide power in the command centres for up to 6hrs in case of power outage.	
	Each command centre will have three rooms: Main room (15m by 10m), server room (4m by 4m), breakout room (8m by 8m). The server room will accommodate the servers, power backup system and network equipment.	
	The break out room shall have the following equipment: Lounge & Reclining chairs, 60inch smart TV, tables, a fridge, microwave, coffee maker,	

	heaters, cabinets and other appropriate furniture. The room shall be designed to help the command centre staff relax during the 20 minute breaks which shall be mandatory.	
	The command centre shall have a Local Area Network (LAN) and clean power wiring which will provide data outlets and power outlets next to every workstation designed in such a way that the command centre will be neat and safe. The prospective vendors will conduct a site survey to enable them scope the deliverable. The LAN shall include infrastructure for Wide Are Connectivity (WAN).	
	KRA will identify the locations for setting up the command centres, the vendor shall provide for partitioning and branding of the established command centres.	

8.1.2 MINIMUM TECHNICAL SPECIFICATIONS AND BILLS OF QUANTITIES OF ITEMS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF ONE (1) BAGGAGE/PALLETIZED SCANNER COMMAND CENTRE.

All technical requirements will be evaluated on pass or fail basis

NO.	ITEM	SPECIFICATION	QTY	BIDDER'S RESPONSE
	Inspection Supervision Station (Image Processing Work Station CPU)	Processor - Intel Core Ultra 7 265 (30 MB cache, 20 cores, 20 threads, 65W) 64GB, 1TB TLC SSD Windows 11 Pro, English version, 3-year worldwide warranty Graphics card: 5070	30	
	Workstation Monitor	32 inch flat-screen display Resolution: 2560*1440 Interface: DP & HDMI & VGA Stand: Flexible stand with capability to: Adjust height, rotate on horizontal axis, and rotate on vertical axis	90	
	UPS (for workstation)	1000w	30	

	UPS (for workstation)	8000w	4	
	Network Switch （PoE)	48 Port POE Switch, 48x10/100/1000Base-T Ethernet ports (PoE), 4x1000Base-X SFP Ethernet ports	2	
	NVR	320mbps 12 million pixels, maximum, h.265 1080P decoding circuit, VGA, HDMI 1 1/2 Gigabit RJ45 interface, 2usb3.0 1CH), 1/audio input/output, support 8 bays (6TB per hard disk), 1 eSATA, 16 / 6 alarm interface input / output, P2P, fisheye dewarp, face detection, RAID0 / 1 / 5 / 6 / 10	4	
	LED TV	85", Wall Mount Bracket	5	
	Splicing Screen	46” splicing screen and accessories for installation	30	
	Bullet Camera (6 for each scanner of the drive through, mobile, car and bus scanner, 4 in total)	1.3MP Low-light IR Bullet Camera International Version, 1/3” progressive scan CMOS, ICR day and night, Up to 1280 x 1024 resolution, HD 720p video, bracket	24	
	Fish eye camera	See the included minimum specifications	6	
	Cabinet	600 x 1000 x 205542U, Black Colour	1	
	Accessories	Network Cable, Network Registered Jack (RJ-45, Cat5E), DVI Monitor Cable, PDU power for cabinets	1	
	Image analysis software	Tailor Made for KRA image analysis	For 30 CPUs	
	Other Items, Accessories, etc. necessary to operationalize the command centre	List all the other Items and Accessories necessary to operationalize the command centre	LOT	
	Furniture			
	Lockable compartments	Pigeon-Hole Lockout Box Storage System	60 lockable compartments	

	Command Centre Desks	Standard command centre desks	30	
	Command Centre Chairs	Orthopaedic chairs	30	
	Fridge	STANDARD 210LTRS DOUBLE DOOR FRIDGE-RT26HAR2DSA FEATURES: cu. ft. 210 Litres Capacity Net Dimensions: 56cm(W) x 63cm(D) x 145cm(H) Digital Inverter Compressor with a 20 Year Warranty Multi flow Air System LED Lighting Easy Slide Shelf Cool Pack – upto 8 hours In-built Power Stabilizer No Frost Technology Big Door Guard Easy Space Manager Tempered Glass Shelves Silver Technology Deodorizer Recessed Easy Handle Multi Storage Basket 5 Star Energy Rating Colour: Silver/black	2	
	Microwave	Standard and large microwave dimensions Capacity usually comes in just over 1.0 cubic foot up to around 2.2 cubic feet on the larger end. Widths can range from about 21 to 25 inches. If you're installing in cabinets, a trim kit will usually bring the width to 27 or 30 inches. Height is usually around 12 to 15 inches. Closed-door depths range from roughly 16 to 20 inches. Open-door depths	2	

		range from roughly 34 to 39 inches.		
	Breakout room tables	Standard coffee table	4	
	Breakout room reclining chairs	Reclining chairs	15	

For Bidder's reference, the dimensions of the Command centre rooms are as follows:

- *Command centre – 20 by 10 metres*
- *Breakout room 8 by 8 metres*
- *Equipment room 4 by 4 metres*

8.1.3 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF SCANNER IMAGE STORAGE, COMPUTE RESOURCES AND SUPPORTING NETWORK INFRASTRUCTURE

KRA Data Centre Resource Requirements

KRA intends to install a virtualized environment for the newly established command centres in line with KRA's standards.

The following table shows the list of resources required to implement a virtualized environment for the production and disaster recovery environments.

Schedule of the equipment to be supplied, delivered and installed.

No	Item/Zone	Breakdown	Qty	Unit Cost	Total Cost
1	Procurement of Compute Resources/ Servers	Rack Mountable servers with full mounting kits and accessories	20		
2	Procurement of Enterprise Hybrid Storage and SAN Switches.	Storage Array	2 units (One Petabyte per DC)		
		SAN Switches	4		
3	SAN Storage	SAN Storage of 50TB	2		
4	Switch	VM Switch	4		

		Management Switch	4		
5	Next generation firewalls	Firewalls	4		
6	VMware	Cloud Foundation	640 cores		
7	Additional Licenses for Kaspersky	Antivirus	150 users		
8	HA Software	Rose HA Tool	6 sets		
9	Info2soft (i2copy)	File Synchronization	8sets (4 per DC)		
10	Operating System: Windows server 2025 64-bit English Data Centre Edition;	Operating System	640 cores		
	Database: Sql Server 2022, English Standard Edition	Database Software	5 sets		
11	IPad Pro 12.9 inch, M1 Pro Chip Pro 256GB WI-FI + cellular Silver	Remote management and monitoring	6		

8.1.3.1 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF RACK MOUNTED HIGH PERFORMANCE SERVERS (QTY=Primary (**10**) Secondary (**10**))

Item No.	**Feature**	**Minimum Specification**	**Bidder's Response (*Narrative answers describing how solution meets specification*)**
	Form Factor	Rack Mountable with full mounting kits and accessories.	
	Processors	The server should support:	
		At least two processors A minimum of 2.3G Intel Xeon 6515P	
		A minimum of 16 cores per processor	
	Memory	The servers must: Support high memory densities.	

		At minimum the servers must be at least 2TB and scalable to at least 8 TB	
	Hard Drives	The system must support:	
		At least four small forms factor internal storage drives SAS SSD, SAS HDD of 1TB each.	
		The drives should be hot swappable.	
	Raid Controller :	At least Integrated 6Gbps SAS hardware RAID 0, 1, 5 and 10. Raid controller should support on line Raid level migration, on line capacity expansion and data scrubbing as well.	
	Network Interface:	Four integrated 10 Gigabit Ethernet ports with full duplex /TCP/IP Offload Engine (TOE).	
		At least two Converged Network Adapters (10GE).	
		Support a converged network.	
		Must support NIC teaming in an active/active configuration	
	Fibre channel	The server should have: • At least two dual Fibre Channel I/O modules with 8/16/32G FC ports with SFP modules where applicable.	
	Expansion Slots	At least 4 x PCIe 2.0 slots	
	IO Ports	At least 1 VGA Port, 1 Serial Port and at least 4 USB 2.0 Slots	
	Server Management	It should have embedded server management system to provide a single point of management for the entire solution from a single pane. It should provide all configuration management, monitoring and reporting tasks.	
		Should support industry standard management interfaces of IPMI and SNMP	
	Operating System	Should Support at least Microsoft windows server 2019, Red Hat Linux 9, Suse Linux 15, Microsoft Hyper-V, VMware ESX 8	
	Power Supply	The chassis should have fully redundant N+1 power supplies	
	Support and Warranty:	At least 3 years on parts, labour and software	

		§ In addition, the equipment MUST include the manufacturer's premier technical support services including: Accelerated hardware replacement options, Operating system updates, Access to Manufacturer's technical assistance team, online troubleshooting / support tools and proactive problem diagnosis services	
	Delivery Period	Preferred delivery lead time for 3 Servers (4 weeks)	
	Warranty	Three (3) year on-site warranty on parts and labour at no additional cost.	

MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISIONING OF ENTERPRISE STORAGE SYSTEM			
No.	**Feature**	**Minimum Specifications**	**Bidder's Response (*Narrative answers describing how solution meets specification*)**
	Scale-Out Architecture	The storage system should support Distributed, fully symmetric clustered architecture that combines modular storage with software	
	Modular Design	The storage system should have 4 self-contained nodes include server, software, and SSDs in a 4U rack-mountable chassis;	
	Operating System	Distributed file system: The storage system should support ability to create a cluster with a single file system and single global namespace; fully journaled, fully distributed, globally coherent write/read cache	
	High Availability	The storage system should have no single point of failure; self-healing design protects against disk or	

		node failure; includes back-end intra-cluster failover	
	Scalability	The storage system should be able to scale from 4 to 144 nodes in a single cluster. Add an additional chassis to scale performance and capacity in a short time	
	Data Protection	The storage system should support file-level striping with support for N+1 through N+4 and mirroring data protection schemes	
	Data Replication	The storage system should have fast and flexible file-based asynchronous replication	
	Data Retention	The storage system should support policy-based retention and protection against accidental deletion	
	Security	The storage system should have file system audit capability to improve security and control of your storage infrastructure and address regulatory compliance requirements	
	Efficiency	The storage system should have a data deduplication option, which can reduce storage requirements by up to 35 percent	
	Automated Storage Tiering	The storage system should support policy-based automated tiering options, to optimize storage resources and lower costs	
	Network Protocol Support	The storage system should support the following protocols: NFSv3, NFSv4, NFS Kerberized sessions (UDP or TCP), SMB1 (CIFS), SMB2, SMB3, SMB3-CA, Multichannel, HTTP, FTP, NDMP, SNMP, LDAP, HDFS, ADS, NIS reads/writes	

	Power Supply	The storage system should have dual-redundant, hot-swappable 1050W (low line) 1100W (high line) power supplies with power factor correction (PFC); rated for input voltages 90 - 130 VAC (low line) and 180-264 VAC (high line)	
	Operating Environment	The storage system should be compliant with ASHRAE A3 data center environment guidelines	
	Warranty	Three (3) year warranty of parts and labour	
TECHNICAL FEATURES			
No.	**Feature**	**Minimum Specifications**	**Bidder's Response (*Narrative answers describing how solution meets specification*)**
		Performance Tier	
	Node Type	15 x 12 TB HDD | 1 x 3.2 TB Cache SSD	
	Nodes	4 Nodes / 1 Chassis	
	RU	8 RU	
	Usable capacity	1000 TB	
Feature	Item No	Minimum Specifications	Bidder's Response (*Narrative answers describing how solution meets specification*)
		Capacity Tier	
	Node Type	20 x 12 TB HDD | 1 x 800 GB Cache SSD	
	Nodes	4 Nodes / 1 Chassis	
	RU	4 RU	
	Usable capacity	1000 TB	

8.1.4 MINIMUM TECHNICAL SPECIFICATIONS FOR SCANNERS

ALL TECHNICAL REQUIREMENTS WILL BE EVALUATED ON PASS OR FAIL BASIS

8.1.4.1 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF DRIVE-THROUGH SCANNER - *(TO BE EVALUATED ON PASS OR FAIL BASIS)*

No.	Feature	Minimum Requirements	Bidder's Response
	X-ray transmission technology	Low energy and high energy x-ray transmission, 3Mev and 6Mev respectively. Organic and metallic materials will be marked using different colours.	
	Operation efficiency	Low and high energy configuration in operations Ease of control of traffic and secure operations	
	Scan object height	4.8 meters at least	
	Scan object width	2.8 meters at least	
	Material discrimination	Orange – for Organic materials (such as explosives, narcotics, cotton, sugar, alcohol etc.) with low atomic number. Blue – for Inorganic materials (such as steel, copper, lead and etc.) with high atomic number.	
	X-ray source	The unit for the generation of the X-rays must produce photons of a suitable energy and intensity, for the complete inspection of containers. The radiation sources must be linear accelerated electrons (LINAC model). The use of radioisotopes and neutrons is not acceptable	
	Penetration	≥300mm steel plate.	
	Spatial resolution	Spatial resolution of 5mm or better at any location at the centre of the container.	
	Wire Detectability	≤2mm steel wire in air	
	Contrast sensitivity	≤2% 2mm thick steel sheet behind 100mm thick steel plate	
	Scan speed	5– 15 km/h	
	Throughput	The scanner shall be able to scan at least 150 trucks per hour	
	Working mode	1) Drive-through scanning mode 2) X-ray automatically avoids driver cab and shuts off	

No.	Feature	Minimum Requirements	Bidder's Response
		3) there must be no distortion in X-ray image within the speed range of 5km/h to 15km/h during scanning	
	Cab scan exclusion	The system shall support technology to automatically avoid scanning cabs for trucks in high energy transmission configuration	
	Continuous scanning	The system shall automatically initiate scanning once the previous scanning activity is complete	
	KRA ICT Policy	The scanner system should conform to the KRA ICT Security Policy	
	Radiation safety	1) The maximum dose rate shall not exceed 1.0 µSv/hr at any position of the restricted area boundary. 2) During operation, radiation dose received by the Operation Crew must not exceed 1.0µSv/hr in the assigned working area. 3)The scanner shall also comply with the World Health Organization (WHO) standards on food irradiation, or equivalent. 4) Under normal scanning operation, the system shall have no adverse effect to the radiation sensitive goods. 5) Radiation dose to the scanned vehicle shall be not be greater than 20µSv per scan at any eligible scanning speed from 5km/h to 15km/h 6) Radiation dose to the driver who drives vehicle going through the scanning tunnel shall not be greater than 0.1 µSv at any eligible scanning speed from 5km/h to 15km/h.	
	Operating temperatures	1) Operating temperature -35 deg C to 40 deg C 2) Storage – 40 deg C to 50 deg C	
	Experiences	The bidder shall have over 5 years of experience in the manufacture, installation, implementation and maintenance of Non-Intrusive Inspection Systems. The bidder shall have over 5 years' experience in the manufacture, installation, implementation and maintenance of drive-through cargo scanner in at least five (5) African countries.	

No.	Feature	Minimum Requirements	Bidder's Response
	Maintenance	The bidder must have qualified site engineer(s) to provide preventative and corrective maintenance service throughout the contract period	
	Integration to KRA system	1). The scanner must be integratable with the KRA iScan system for centralized image storage in the KRA data centres and centralized image analysis from the KRA scanner command centres using Unified File Format (UFF) and other lossless image formats eg, PNG and BMP. 2). The scanner shall be integrated with KRA iScan system at the supplier's own cost.	
	Monitoring Radioactive Materials	The scanner shall include a Radiation Portal Monitor integrated to the Centralised Command and Control Centre.	
	Scanner Site Scanned Image Storage	The scanner shall include sufficient storage capacity to store scanned images at the scanner site for at least five (5) years before archiving.	
	Warranty and maintenance	Warranty for three (3) years and maintenance service for seven (7) years including parts, labour, materials and other infrastructure.	

8.1.4.2 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF CT BAGGAGE SCANNER - *(To be evaluated on pass or fail basis)*

No.	Feature	Minimum Requirements	Bidder's Response
	X-ray imaging	1) The system shall apply dual-energy Computed Tomography (CT) technology to produce colour CT slice image and 3D image 2) The system must have independent dual-energy digital radiography system with high-resolution digital radiography image for easy image analysis	

No.	Feature	Minimum Requirements	Bidder's Response
	Material discrimination	Material discrimination with different colours on organics, minerals and mixtures	
	Wire Resolution	The Wire Resolution of digital radiography image shall be at least 38AWG	
	Steel penetration	The steel penetration of digital radiography image shall be at least 30mm	
	Spatial resolution	Minimum 2mm line pair	
	Equipment dimensions	1) Maximum width is less than 1650 mm 2) Maximum height is less than 1850 mm.	
	Tunnel dimensions	1) Maximum width is no less than 750mm 2) Maximum height is no less than 600mm 3) Maximum baggage size: 2000mm(L) × 750mm (W) × 410mm (H)	
	Throughput	≥860BPH	
	The belt height	no less than 690mm	
	Maximum load	≥ 200kg (even distributed)	
	Weight	≤ 3000kg	
	Detection capability	The system shall be able to detect drugs, ivory, explosives knives and guns automatically.	
	Image process	*Digital Radiography image processing functions* The equipment shall have image processing functions, including black and white, organic stripping, inorganic stripping, super enhancement, negative, high / low penetration and edge enhancement at least. The stepwise and stepless zoom functions up to 64 times shall be given, with miniature indicator for quick selection of image zooming regions	

No.	Feature	Minimum Requirements	Bidder's Response
		3D image processing functions The equipment shall have image processing functions, including black and white, organic stripping, inorganic stripping, super enhancement, negative and edge enhancement at least. The 3D image shall be rotated in any direction. The suspicious cargo shall be displayed separately in 3D images. Operators shall mark the suspicious cargo with a certain operation.	
	Image archive management	1) The equipment shall be able to store all the screening images automatically. The auto saved images shall be deleted in FIFO rule when the hard disk is full. 2)The images can be copied manually into user created folders, and then the copies shall be not to be deleted automatically. 3) The images shall be saved along with screening time and date, user ID, and bar code on the baggage if read when screened. 4) The X-ray images shall be able to be converted to general image format, such as BMP, JPG and PNG, etc. 5) The images shall be able to be printed and exported to USB interface storage devices.	
	Radiation Safety	1) The X-ray leakage shall be less than 1μSv/hour at 5cm away from the equipment housing. 2) The equipment shall be equipped with emergency stop buttons, at entry and exit of the X-ray CT inspection system and the control console, to enable the operators to cut off the power to X-ray generators and moving components in case of emergency, with warning information displayed on the monitor	

No.	Feature	Minimum Requirements	Bidder's Response
	Operational environment requirements	1) Power: Single-phase supply, 240VAC (-15%～+10%), 50Hz/60Hz±3Hz 2) Operating Temperature / Humidity: 0℃～+40℃/5%～95% (Non-condensing) 3) Storage Temperature / Humidity-40℃～+60℃/5%～95% (Non-condensing) 4) Power consumption: no more than 5kVA	
	Experiences	The bidder shall have over 5 years of experience in the manufacture, installation, implementation and maintenance of Non-Intrusive Inspection Systems. The bidder shall have over 5 years' experience in the manufacture, installation, implementation and maintenance of CT baggage scanner in at least five (5) African countries.	
	Maintenance	The bidder must have qualified engineer(s) to provide preventative and corrective maintenance service throughout the contract period	
	Integration to KRA	1). The scanner must be integratable with the KRA iScan system for centralized image storage in the KRA data centres and centralized image analysis from the KRA scanner command centres using lossless image formats eg, TIFF, PNG and BMP. 2). The scanner shall be integrated with KRA iScan system at the supplier's own cost.	
	Scanner Site Scanned Image Storage	The scanner shall include sufficient storage capacity to store scanned images at the scanner site for at least five (5) years before archiving.	
	Warranty and maintenance	Warranty for three (3) years and maintenance service for seven (7) years including parts, labour, materials and other infrastructure.	

8.1.4.3 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF MOBILE SCANNER-

(To be evaluated on pass or fail basis)

No.	Feature	Minimum Requirements	Bidder's Response
1.	Type of X-ray source	a)-Interlaced Dual-energy Electron Linear Accelerator. The unit for the generation of the X-rays must produce photons of a suitable energy and intensity, for the complete inspection of containers. The radiation sources must be linear accelerated electrons (LINAC model). b)-The use of radioisotopes and neutrons is not acceptable c)-Low and high energy configuration in operations.	
2.	X-ray energy	6MeV and 3MeV	
3.	Material discrimination function	a)-Organic material and inorganic material can be distinguished and marked by specified colours b)-Orange – for Organic materials (such as explosives, narcotics,	

		cotton, sugar, alcohol etc.) with low atomic number. Blue – for Inorganic materials (such as steel, copper, lead and etc.) with high atomic number.	
4.	Penetration	320 mm steel	
5.	Max. Dim. of scanned vehicle	Length:18.0m Width: 2.6m Height: 5m (Length can be expandable on request of customers)	
6.	Throughput	20~25 units of 40 ft container vehicles per hour	
7.	Scanning method	Scanned objects keep still and the Scanning Vehicle moves	
8.	Wire Detectability	≤2mm steel wire in air	
9.	Spatial resolution	Spatial resolution of 5mm or better at any location at the centre of the container	
10.	Contrast sensitivity	≤2% 2mm thick steel sheet behind 100mm thick steel plate	
11.	KRA ICT Policy	The scanner system should conform to the KRA ICT Security Policy	

12.	Experiences	The bidder shall have **over 5 years of experience** in the manufacture, installation, implementation and maintenance of Non-Intrusive Inspection Systems. The bidder shall have over 5 years' experience in the manufacture, installation, implementation and maintenance of mobile cargo scanners in **at least five (5) African countries.**	
13.	Maintenance	The bidder must have qualified site engineer(s) to provide preventative and corrective maintenance service throughout the contract period	
14.	Integration to KRA system	a). The scanner must be integratable with the KRA iScan system for centralized image storage in the KRA data centres and centralized image analysis from the KRA scanner command centres using the iScan system image analysis software. b). The scanner shall be integrated with KRA iScan system at the supplier's own cost.	
	Power		

1.	Power capacity	24kVA	
2.	Voltage	240/415±10% VAC, 3-phase 5- wire or configured according to customers' requirement.	
3.	Frequency	50±1 Hz or configured according to customers' requirement	
	Environment		
4.	Operation temperature	-15°C ~ +45°C (optional -30°C ~ +45°C or -15°C ~ +55°C)	
5.	Storage temperature	-30°C ~ +55°C	
6.	Humidity range	0%~99%, non-condensing	
	Radiation Safety		
7.	Radiation protection area	41m(L)×31m(W) (For 18m scanning length)	
8.	Dose rate on the system boundary	2.5 μSv/h	
9.	Absorbed dose to cargo per scan	10 μSv	
10.	Occupational annual effective dose	2mSv	
11.	Public annual effective dose	0.2mSv	
	Operation & Inspection Subsystem		
	Computer monitor	19" LCD Monitor at least	
	Printer	A4 color printer	
	Scanner	A4 Scanner	
	Image analysis	Pseudo colour transformation; edge	

		enhancement; filter; Linear/logarithm transformation; histogram equalization; suspicious item mark and comments; multi-image comparison; area calculation; user define macro; image format transformation, etc.	
	Zoom	1/4 X, 1/2 X, 1X, 2X, 4X	
	Image acquisition mode	Real-time, synchronized	
	Operation Features		
18.	Standard operator number	2 (one system control operator and one image inspector)	
	Setup time	30 minutes	
20.	Scanning Speed	0.4 m/s	
21.	Wind resistance	56 km/h at operation	
22.	Maximum driving speed at transportation status	90 km/h	
23.	Overall road driving dimension (Length x Width x Height)	12 m x 2.5 m x 4 m	
24.	Scanner Site Scanned Image Storage	The scanner shall include sufficient storage capacity to store scanned images at the scanner site for at least five (5) years before archiving.	

25.	Warranty and maintenance	Warranty for three (3) years and maintenance service for seven (7) years including parts, labour, materials and other infrastructure.	

8.1.4.4 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF BUS SCANNER - *(To be evaluated on pass or fail basis)*

No.	Item	Specification	Bidder's Response- (Pass/Fail)
	Type of X-ray source	Electron Linear Accelerator	
	X-ray energy	1 MeV	
	Penetration	Conveying-scan Mode: 150 mm steel	
	Max. Dim. of scanned vehicle	12 m(L) ×2.6 m(W) ×3.6 m(H)	
	Throughput	Conveying-scan Mode: 18 units of 12m long vehicles per hour	
	Scanning speed	Conveying-scan mode: 0.2 m/s	
	Material discrimination function	Conveying-scan Mode: Organic, inorganic and mixed materials can be discriminated and marked with specified colours	
	Power		
	Voltage	240V ± 10% for single phase or 415 ±10%	

		VAC, 3-phase 5-wire or configured according to KRA's requirement.	
	Frequency	50±1 Hz or configured according to KRA's requirement.	
	Radiation Safety		
	Radiation protection area	20m(L) × 6m(W) (with self-integrated radiation shielding wall)	
	Average dose rate on the system boundary	⩽ 2.5μSv/h	
	Occupational annual effective dose	≤ 2 mSv	
	Public annual effective dose	≤ 0.2mSv	
	Maintenance	The bidder must have qualified site engineer(s) to provide preventative and corrective maintenance service throughout the contract period	
	Network	Network capability with already existing NII system	
	Integrated number plate recognition	Associated data with NII image	
	Integrated radiation detection /RPM	Gamma and nuclear detection, (Radioactive sources)	
	Integration to KRA system	1). The scanner must be integratable with the KRA iScan system	

		for centralized image storage in the KRA data centres and centralized image analysis from the KRA scanner command centres using Unified File Format (UFF) and other lossless image formats eg, PNG and BMP. 2). The scanner shall be integrated with KRA iScan system at the supplier's own cost.	
	Scanner Site Scanned Image Storage	The scanner shall include sufficient storage capacity to store scanned images at the scanner site for at least five (5) years before archiving.	
	Warranty and maintenance	Warranty for three (3) years and maintenance service for seven (7) years including parts, labour, materials and other infrastructure.	

8.1.4.4 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF CAR SCANNER - *(To be evaluated on pass or fail basis)*

No.	Item	Specification	Bidder's Response (Pass/Fail)
1	Type of X-ray	Electron Linear Accelerator	

	source		
2	X-ray energy	1 MeV	
3	Penetration	Conveying-scan Mode: 150 mm steel	
4	Max. Dim. of scanned vehicle	7 m(L) ×2.2 m(W) ×2.8 m(H)	
5	Throughput	Mode: 40 units of 5.6 m long vehicles per hour	
6	Scanning speed	Conveying-scan mode: 0.2 m/s	
7	Material discrimination function	Conveying-scan Mode: Organic, inorganic and mixed materials can be discriminated and marked with specified colors	
8	**Power**		
	Voltage	240V ± 10% for single phase or 415 ±10% VAC, 3-phase 5-wire or configured according to KRA's requirement.	
	Frequency	50±1 Hz or configured according to KRA's requirement.	
9.	**Radiation Safety**		
	Radiation protection area	8 m(L) × 4.2 m(W) (with self-integrated radiation shielding wall)	
	Average dose rate on the system boundary	≤ 2.5μSv/h	
	Occupational annual effective dose	≤ 2 mSv	
10.	Maintenance	The bidder must have qualified site engineer(s) to	

		provide preventative and corrective maintenance service throughout the contract period	
12.	Network	Network capability with already existing NII system	
13.	Integrated number plate recognition	Associated data with NII image	
14.	Integrated radiation detection /RPM	Gamma and nuclear detection, (Radioactive sources)	
15.	Integration to KRA system	1). The scanner must be integratable with the KRA iScan system for centralized image storage in the KRA data centres and centralized image analysis from the KRA scanner command centres using Unified File Format (UFF) and other lossless image formats eg, PNG and BMP. 2). The scanner shall be integrated with KRA iScan system at the supplier's own cost.	
16.	Scanner Site Scanned Image Storage	The scanner shall include sufficient storage capacity to store scanned images at the scanner site for at least five (5) years before archiving.	
17.	Warranty and maintenance	Warranty for three (3) years and maintenance service for seven (7) years including parts, labour, materials and other infrastructure.	

8.1.4.5 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF RADIATION PORTAL MONITORS

(To be evaluated on pass or fail basis)

No.	Technical Specifications and Standards	Bidder's Response
1.	**Detection Zone:** 0.2m to 4.0m vertical above road surface and minimum 4.8m between two pillars	
2.	Passing through Speed: Minimum 8km/hr	
3.	Two gamma detectors per pillar.	
4.	Net Detector Volume in one pillar per detector: ⩾4.5x103 cm3 (4.5liters) plastic scintillators.	
5.	Energy range: 30keV to 3.0MeV	
6.	Lead equivalent Shielding >5mm on sides facing off detection Zone	
7.	Four Neutron Detectors per pillar.	
8.	Detector volume per pillar 1 x (30mm diameter X 1000mm 3He tubes) embedded in a polyethylene block or other nontoxic equivalent	
9.	**Performance Specification** Gamma Radiation detection should meet IEC 62244 or equivalence.	
10.	SNM (special nuclear materials) detection should meet IEC 62244 or equivalence.	
11.	False alarm rate should be less than 1 in 1000 passengers (neutron and gamma).	
12.	The time taken for the alarm to return to non-alarming state after the dose rate is returned to per-exposure level shall not be longer than one (1) minute.	
13.	Warranty for three (3) years and maintenance service for seven (7) years including parts, labour, materials and other infrastructure.	

8.1.4.6 USER REQUIREMENTS FOR CENTRAL ALARM STATION (CAS) SOFTWARE - (To be evaluated on pass or fail basis)

NO.	MINIMUM REQUIREMENTS, TECHNICAL SPECIFICATIONS AND STANDARDS	BIDDER'S RESPONSE
The CAS software shall include the following functionality:		
	Ability to interface with multiple RPMs;	
	Automated recording, storing and processing information from RPM;	
	Graphic User Interface (GUI) to support front line officers in viewing RPM information, as well as resolve alarms and other system conditions. This includes, but is not limited to:	
	Documentation of radiation alarms (open-suspend-close);	
	Display of date-time (ISO format), type of alarm;	
	Display of radiation profiles in counts per second versus time in seconds scale for neutrons and gamma in case of alarm for each RPM panel (top-bottom-left-right) with indication of total count rate as a function of time and occupancy intervals;	
	Supporting the attachment of RID spectrum from secondary inspection in an alarm report, and storage in the CAS database;	
	Data retrieval from CAS database and review (including visual info and radiation profiles);	
	Ability to create and save in.pdf file format an alarm report with, at minimum, attributes of the RPM, date and time the alarm occurred, identification of the RPM operator who acknowledged the alarm, details of the radiation alarm (radiation profiles in scale), image of the object that caused the alarm;	
	On-line display of RPM system performance (status indicator, prompt gamma and neutron count rate);	
	Support of LAN and TCP/IP connection;	
	Password-protected setup of critical RPM parameters and alarm database;	

8.1.4.7 MINIMUM TECHNICAL SPECIFICATIONS AND BILLS OF QUANTITIES OF ITEMS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF ONE (1) CONTAINERIZED CARGO COMMAND CENTRE - *(To be evaluated on pass or fail basis)*

NO.	ITEM	SPECIFICATION	BIDDER'S RESPONSE

	Inspection Supervision Station (Image Processing Work Station CPU)	Intel Xeon W3-2423 (15 MB cache, 6 cores, 12 threads, turbo up to 4.2 GHz Turbo, 120 W); RAM 16G, 1T SSD, A1000 8G, USB keyboard (English) + optical mouse Case, Windows 11 Professional 64-bit English	
	Workstation Monitor	32 inch flat-screen display Resolution: 2560*1440 Interface: DP & HDMI & VGA Stand: Flexible stand with capability to: Adjust height, rotate on horizontal axis, and rotate on vertical axis	
	UPS (for workstation)	1000w	
	UPS (for workstation)	8000w	
	Network Switch（PoE)	48 Port POE Switch, 48x10/100/1000Base-T Ethernet ports (PoE)，4x1000Base-X SFP Ethernet ports	
	NVR	320mbps 12 million pixels, maximum, h.265 1080P decoding circuit, VGA, HDMI 1 1/2 Gigabit RJ45 interface, 2usb3.0 1CH), 1/audio input/output, support 8 bays (6TB per hard disk), 1 eSATA, 16 / 6 alarm interface input / output, P2P, fisheye dewarp, face detection, RAID0 / 1 / 5 / 6 / 10	
	LED TV	85", Wall Mount Bracket	
	Splicing Screen	46” splicing screen and accessories for installation	
	Bullet Camera (6 for each scanner of the drive through, mobile, car and bus scanner, 17 in total)	1.3MP Low-light IR Bullet Camera International Version, 1/3” progressive scan CMOS, ICR day and night, up to 1280 x 1024 resolution, HD 720p video, bracket	
	Fish eye camera	See the included minimum specifications	
	Cabinet	600 x 1000 x 205542U, Black Colour	
	Accessories	Network Cable, Network Registered Jack (RJ-45, Cat5E), DVI Monitor Cable, PDU power for cabinets.	
	Image analysis software	Tailor Made for KRA image analysis	
	Other Items, Accessories, etc. necessary to operationalize	List all the other Items and Accessories necessary to operationalize the command centre	

	the command center		
	Furniture		
	Lockable compartments	Pigeon-Hole Lockout Box Storage System	
	Command Centre Desks	Standard command centre desks	
	Command Centre Chairs	Orthopaedic chairs	
	Fridge	STANDARD 210LTRS DOUBLE DOOR FRIDGE- RT26HAR2DSA FEATURES: cu. ft. 210 Litres Capacity Net Dimensions: 56cm(W) x 63cm(D) x 145cm(H) Digital Inverter Compressor with a 20 Year Warranty Multi flow Air System LED Lighting Easy Slide Shelf Cool Pack – upto 8 hours In-built Power Stabilizer No Frost Technology Big Door Guard Easy Space Manager Tempered Glass Shelves Silver Technology Deodorizer Recessed Easy Handle Multi Storage Basket 5 Star Energy Rating Colour: Silver/black	
	Microwave	Standard and large microwave dimensions Capacity usually comes in just over 1.0 cubic foot up to around 2.2 cubic feet on the larger end. Widths can range from about 21 to 25 inches. If you're installing in cabinets, a trim kit will usually bring the width to 27 or 30 inches. Height is usually around 12 to 15 inches. Closed-door depths range from roughly 16 to 20 inches. Open-door depths range from roughly 34 to 39 inches.	
	Breakout room tables	Standard coffee table	

	Breakout room reclining chairs	Reclining chairs	
	Experience	The bidder shall have over 5 years' experience in the manufacture, installation, implementation and maintenance of Cargo Scanner Integration and Command Centers in five (5) African countries.	

For Bidder's reference, the dimensions of the Command centre rooms are as follows:

- *Command centre – 20 by 10 metres*
- *Breakout room 8 by 8 metres*
- *Equipment room 4 by 4 metres*

8.1.4.8 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF FISHEYE 360 DEGREE IP CAMERA- *(To be evaluated on pass or fail basis)*

NO.	FEATURE	MINIMUM SPECIFICATION	BIDDER'S RESPONSE
	Media Processor	High performance, state brand and model	
	Image Sensor	1/1.8″ 5MP progressive scan CMOS	
	Shuttle time	1/5s to 1/50,000s	
	Min Illumination	Color：0.2 Lux /F1.2 B/W：0.003 Lux / F1.2;0 Lux IR On	
	Fisheye Lens	1.57mm	
	Day&Night	IR cut filter with auto switch	
	Compression		
	Video Compression	H.265/H.264/MJPEG	
	Coding standard	H.265 MainProfile, H.264 Baseline/MainProfile/HighProfile,	
	Image		
	Max Image Size	2592(H)×1944(V)	
	Stream	Dual-stream	
	Frame Rate	Main Stream： 30fps @(2592 × 1944),60fps @(1920 × 1080) Sub-stream : 30fps (640 × 480);	

	Network		
	Alarm Trigger	Motion detection, tampering alarm, network disconnect, storage exception	
	Protocols	IPv4/IPv6、RTSP/RTP/RTCP、TCP/UDP、HTTP、DHCP、DNS、FTP、DDNS、PPPoE、SMTP、QOS 、Onvif	
	Onvif	V2.4 Version	
	Browser	IE(8、9、10、11),Chrome, Firefox, Safaribetc, etc	
	Software Development Kit	Linux/Windows C++/C SDK	
	Interface		
	Network	1 RJ45 10M/100M adaptive Ethernet port	
	Reset	A reset button (press and hold 3 seconds valid)	
	General Specifications		
	Operating Conditions	-40℃ ~ 60℃, humidity less than 95%	
	Weather-proof rating	IP66	
	Warranty	Three (3) year warranty including parts and labour	

8.1.4.9 MINIMUM TECHNICAL SPECIFICATIONS FOR SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF 85-INCH SMART DISPLAY SCREEN FOR COMMAND CENTRE –

(To be evaluated on pass or fail basis)

No.	FEATURE	MINIMUM SPECIFICATIONS	BIDDER'S RESPONSE (*Narrative answers describing how the proposed product meets the minimum specification*)
1.	Brand and Model	Internationally recognized brand (bidders must specify brand and model).	

2.	Product datasheet	MUST attach Manufacturer datasheet/brochures for the proposed product. Key technical features MUST be highlighted.	
3.	Operating Software	Android TV	
4.	Display technology	LED/LCD	
5.	Screen Size	Minimum 84" inches Maximum 87" inches	
6.	Screen Type	Flat Panel	
7.	Screen Mirroring/ Casting	Screen Mirroring/Casting	
8.	Graphics & Resolution	3840*2160 pixels (4K) UHD	
9.	Orientation	Landscape	
10	Panel refresh rate	100Hz	
11.	Connectivity	Integrated Wireless LAN capability (Wi-Fi Certified 802.11a/b/g/n/ac) Integrated Ethernet 10/100/1000 Gigabit LAN port -Bluetooth: Version 4.2; HID (mouse/keyboard connectivity)/HOGP (Low Energy device connectivity)/SPP (Serial Port Profile)/A2DP (stereo audio)/AVRCP (AV remote control). -Smartphone connectivity: Chromecast built-in. -HDMI: minimum of 3. -USB: Minimum of 2. -Headphone output.	
12.	USB drive format support	- FAT16/FAT32/exFAT/NTFS	
13.	USB playback codecs	-MPEG1: MPEG1/MPEG2PS: MPEG2/MPEG2TS (HDV, AVCHD): MPEG2, AVC/MP4 (XAVC S): AVC, MPEG4, HEVC/AVI: Xvid, MotionJpeg/ASF (WMV): VC1/MOV: AVC, MPEG4, MotionJpeg/MKV: Xvid, AVC, MPEG4, VP8.	

		HEVC/WEBM: VP8/3GPP: MPEG4, AVC/MP3/ASF (WMA)/WAV/MP4AAC/FLAC/JPEG; WEBM: VP9/AC4/ogg/AAC/ARW.	
14.	Viewing Angle	Wide angle	
15.	Video signal support	7680x4320p (24, 30 Hz), 4096x2160p (24, 60 Hz), 3840x2160p (24, 30, 60, 120 Hz), 1080p (30, 60, 120 Hz), 1080/24p, 1080i (60 Hz), 720p (30, 60 Hz), 720/24p, 480p	
16.	Audio Power Output	20Watt Speakers or better	
17.	Speaker Type	2-Channel or better	
18.	Audio format support	Dolby Audio and DTS Digital Surround	
19.	Microphone	In-built	
20	Internet Browser	Installed.	
21.	Power	-220-240 V, 50 Hz	
22.	Accessories	-AC Power Cord. -Batteries. -TV wall mounting brackets. -Operating Instructions. -Quick Setup Guide. -Voice Remote Control. - 2 x 15m HDMI cables	
23.	Warranty	Three (3) years on-site warranty on parts and labour	

9. -VENDOR EVALUATION

Bidder Experience		**Maximum score**
No.	**Requirement Description**	
	Firm's Experience To qualify, bidders must provide clear evidence of their operational and project experience as outlined below. **Minimum Experience Required (Pass/Fail Criteria)** To proceed to evaluation, the bidder must demonstrate: A minimum of **5 years** in scanner supply, maintenance, repair, and integration support.	27

Successful integration of cargo scanners with centralized image analysis and command centers at **5 distinct sites in Africa**.

Required Supporting Documentation

Submit the following for work completed in the past **5 years**:

A. For General Scanner Operations & Maintenance:

For **five (5) different clients**, provide:

A copy of the **Purchase Order or Signed Contract**.
A corresponding **Client Reference Letter or Completion Certificate** confirming satisfactory service.

B. For African Scanner Integration Projects:

For **five (5) different African sites**, provide one clear proof per site:

Signed Contract, **or**
Purchase Order, **or**
Completion Certificate, **or**
Client Recommendation Letter.

Evaluation Scoring Matrix

1. Years of Experience
Beyond the 5-year minimum - • **>5 years:** 3 pts
• **3-5 years:** 2 pts

Criteria	Max Score	How to Earn Points
1. Years of Experience Beyond the 5-year minimum	3	>5 years: 3 pts 3-5 years: 2 pts
2. Proven Service Delivery (Per client)	10	2 pts per client Awarded only for a complete set (PO/Contract + Reference). Max: 5 clients = 10 pts.

	3. African Integration Experience (Per site)	10	2 pts per verified African site. Max: 5 sites = 10 pts.	
	4. Historical Contract Value (Total value of contracts)	4	> Ksh 3B: 4 pts Ksh 1.5B – 3B: 2 pts < Ksh 1.5B: 0 pts	
2	***Project Team***			
	Managerial and Key Personnel Competency Profiles Bidders must propose qualified technical personnel to manage and execute the contract. The evaluation will focus on the competency of the proposed Team Leader and a minimum of two (2) key technical support staff. **Mandatory Submission Requirements** For each proposed key person (the Team Leader and the two key technical staff), you must submit: A detailed Curriculum Vitae (CV). A copy of relevant academic certificates. **Team Leader: Minimum Requirements (Pass/Fail)** The proposed Team Leader must meet the following two conditions to be considered responsive: **Academic Qualification:** Hold a Bachelor's degree in Electrical & Electronics Engineering or a directly related field. **Experience:** Possess at least eight (8) years of relevant technical experience in the supply, delivery, installation, and commissioning of cargo and baggage scanners for maritime borders, land borders, or airports. **Team Leader: Competitive Scoring Criteria** Bidders whose Team Leader meets the minimum requirements will be scored on the following enhanced qualifications, for a maximum of 14 points. **Academic Qualification (6 Points Maximum)** The mandatory Bachelor's degree is the base requirement (0 points). An additional relevant postgraduate degree (e.g., MSc) earns 3 points.			14

	A second relevant degree or diploma earns 3 points. **Professional Certification (4 Points Maximum)** Membership in a relevant, recognized professional body (e.g., IEK, IEEE) earns 2 points. An additional relevant professional certification (e.g., PMP, advanced technical certificate) earns 2 points. **Relevant Technical Experience (4 Points Maximum)** Having the minimum 8 years of experience earns 2 points. Each full year of relevant experience beyond 8 years earns an additional 0.5 points, up to a maximum of 2 extra points (e.g., 12 years of experience would earn the full 4 points). **Key Technical Support Staff: Scoring Criteria** A minimum of two (2) key technical staff must be proposed. Each staff member will be scored individually based on their CV, for a maximum of 5 points each (10 points total for both). **Scoring per Technical Staff Member:** **Relevant Technical Experience (3 Points):** 5 or more years of experience in scanner maintenance/support: 3 points. 3 to 4 years of experience: 2 points. 1 to 2 years of experience: 1 point. **CV Clarity & Relevance (2 Points):** A well-structured CV that explicitly details hands-on scanner maintenance, repair, and support experience: 2 points. A generic CV with limited detail on specific scanner-related tasks: 1 point. An unclear or irrelevant CV: 0 points.	
	Key Experts The bidder must propose a minimum of two (2) qualified Technical Experts. The qualifications and experience of each proposed expert will be evaluated and scored individually. Each proposed Technical Expert **must** meet both conditions below to be considered compliant. Failure of any proposed expert to meet these will result in disqualification of the entire proposal on these grounds. **Academic Qualification:** Must hold a Bachelor's degree in Electrical & Electronics Engineering or a directly related field.	14

	Core Experience: Must possess a minimum of five (5) years of relevant technical experience. This experience must be in the **supply, delivery, installation, and commissioning of cargo and baggage scanners** within operational environments such as **maritime borders, land borders, and/or airports**. **Competitive Scoring Matrix** For each expert who meets the mandatory criteria above, points will be awarded based on the following enhanced qualifications. The maximum score for this section is **14 points** (7 points per expert, for two experts). **A. Academic Qualification (Maximum of 5 points per expert)** **Relevant Bachelor's Degree (Mandatory for compliance):** 0 points (base requirement). **Possession of a relevant Postgraduate Degree (e.g., MSc, MEng):** 5 points. *Note: Only the highest degree will be scored.* **B. Relevant Technical Experience (Maximum of 2 points per expert)** Scoring is based on years of experience **in the specific field** as defined in Section 4.1. **5 or more years of experience:** 2 points. **3 to 4 years of experience:** 1 point. **Less than 3 years:** 0 points (however, this would fail the mandatory 5-year requirement). **Summary of Scoring** **Scoring is performed per expert.** **Expert 1 Score** = Academic Points (max 5) + Experience Points (max 2). **Expert 2 Score** = Academic Points (max 5) + Experience Points (max 2). **Total Section Score** = Expert 1 Score + Expert 2 Score. **Maximum Possible Score for this Section: 14 points.**	
	Total Scores	55
	Cut Off	48

10. SUMMARY OF THE EVALUATION SCORES

Criteria	Maximum Score / Requirement	Cut-off Score
Tender Responsiveness (Mandatory Requirements)	Mandatory	Met
Technical Evaluation	55	48
Vendor/Bidder Evaluation		
Technical requirements/Specifications	Mandatory	Met
Solution Simulation Demo	25	20
Total Scores	80	68
Financial Evaluation	QCBS	
Award	QCBS	
Due diligence / Post Qualification	KRA may conduct due diligence to any or all the provided reference sites to ascertain past performance.	

FINANCIAL REQUIREMENT

- ***N/B: Bidders to provide a detailed breakdown of how they have arrived at the total cost***
- ***Grand Total Cost –To be carried Forward to the FORM FIN 2 Summary of Costs***

11. Non-Functional Mandatory Security Requirements

No	Feature	Security Requirement
High Level Security Requirements		
1	Data Encryption	All data, both at rest and in transit, must be encrypted using industry-standard encryption algorithms to prevent unauthorized access. Any vendor proprietary encryption algorithm must be FIPS-140 certified.
2	Access Control	The system must implement robust access control mechanisms, including multi-factor authentication, role-based access controls, and the principle of least privilege.

3	Auditing and Logging	Comprehensive audit trails must be maintained for all system activities, enabling traceability and accountability. Ensure the logs are in a format that is consumable by Security information and event management (SIEM) system.
4	Incident Response	An effective incident response plan must be established by the vendor to address security breaches or incidents promptly and minimize impact.
5	Data Integrity	Mechanisms must be in place to ensure the integrity of data, including checksums, digital signatures, and blockchain technology where applicable.
6	Continuous Monitoring	The system must have continuous monitoring capabilities to detect and respond to security threats in real-time.
7	Security Training	Vendors must provide security training for system users and administrators to foster a culture of security awareness.
8	Secure Development	The solution must be developed following secure coding practices, and vendors must demonstrate a commitment to security throughout the software development lifecycle.
9	Authentication	No identification and authentication information must be hard-coded or scripted into the application.
10	Compliance to Detailed KRA Security Requirements	The solution must be implemented in compliance with the detailed KRA Application Security requirements (Annex I) and API Security requirements (Annex II). The detailed requirements will form part of the Information Security testcases.