



महानिदेशालय/ DIRECTORATE GENERAL
केन्द्रीय औद्योगिक सुरक्षा बल/ CENTRAL INDUSTRIAL SECURITY FORCE
(गृह मंत्रालय)/(MINISTRY OF HOME AFFAIRS)

ब्लॉक 13 सी.जी.ओ. काम्प्लेक्स/ BLOCK-13, CGO COMPLEX,
लोधी रोड, नई दिल्ली -03/ LODHI ROAD, NEW DELHI

No.W-42022/34/CISF/TECH/QRS-TDS/2025-121236-(E)

Dated : 03-11-2025

To,

वरिष्ठ तकनीकी निदेशक, राष्ट्रीय सूचना-विज्ञान केन्द्र, नॉर्थ ब्लॉक, गृह मंत्रालय, नई दिल्ली
The Senior Technical Director, NIC, North Block, MHA, New Delhi,
ई-मेल पता : mpsugandhi@nic.in

**Subject :-REQUEST FOR COMMENTS OF STAKEHOLDERS/OEM ON
DRAFT QRS AND TDS OF XBIS DUAL VIEW CARGO, XBIS DUAL VIEW
AND CTX : REG.**

गृह मंत्रालय के पत्र संख्या 11012/02/2009/FIn/1-17 दिनांक 02/01/2018 एवं गृह मंत्रालय के
आफिस मेमोरेन्डम दिनांक 13/06/2012 के संदर्भ में।

2. उपरोक्त विषयान्तर्गत सूचित किया जाता है कि विशेष महानिदेशक/एयरपोर्ट, के.ओ.सु.ब कि
अध्यक्षता में तकनीकी विशेषज्ञों के उप समूह द्वारा “XBIS DUAL VIEW CARGO, XBIS
DUAL VIEW AND CTX” के गुणात्मक आवश्यकता/परीक्षण निर्देशों (Draft QRs/TDs) के
मसौदे का प्रारूप तैयार किया गया है, उक्त उपकरण के गुणात्मक आवश्यकता/परीक्षण निर्देश को
गृह मंत्रालय की वेबसाइट पर 15 दिन के लिए अपलोड करने का श्रम करें।

संलग्न: उपरोक्तनुसार (गुणात्मक आवश्यकता/परीक्षण निर्देश (Draft QRs/TDs)

Digitally signed by
पाटिल अभय आनंद
PATIL ABHAY ANAND,
उप कमाण्डेन्ट/तकनीकी
DEPUTY COMMANDANT/TECH,
FHQ NEW DELHI,
03-11-2025

Copy to:-

अनुभाग अधिकारी/ईडीपी - XBIS DUAL VIEW CARGO, XBIS DUAL VIEW AND CTX के
गुणात्मक आवश्यकता/परीक्षण निर्देशों की एक प्रति इस अनुरोध के साथ संलग्न है कि इसे 15 दिनों
के लिए सीआईएसएफ की वेबसाइट पर अपलोड करने का श्रम करें।



महानिदेशालय/ DIRECTORATE GENERAL
केन्द्रीय औद्योगिक सुरक्षा बल/ CENTRAL INDUSTRIAL SECURITY FORCE
(गृह मंत्रालय)/(MINISTRY OF HOME AFFAIRS)

ब्लॉक 13 सी.जी.ओ. काम्प्लेक्स/ BLOCK-13, CGO COMPLEX,
लोधी रोड, नई दिल्ली -03/ LODHI ROAD, NEW DELHI
No.W-42022/34/CISF/TECH/QRS-TDS/2025-121238-(E) Dated : 03-11-2025

XBIS DUAL VIEW CARGO, XBIS DUAL VIEW AND CTX के गुणात्मक आवश्यकता/परीक्षण निर्देशों के मसौदे पर विक्रेताओं की टिप्पणियों का आमंत्रण।

आपको सूचित किया जाता है कि XBIS DUAL VIEW CARGO, XBIS DUAL VIEW AND CTX के गुणात्मक आवश्यकता/परीक्षण निर्देशों (Draft QRs/TDs) के मसौदे पर फर्मों/विक्रेताओं की टिप्पणियां आमंत्रित हैं। सभी फर्मों से निवेदन है कि नीचे दिए गए प्रारूप में वे अपनी टिप्पणियां भरकर OEM certificate सहित भेजें:

Qualitative Requirements (QRs)	Trial Directives (TDs)	Comments of Firms

2. आपसे अनुरोध है कि वेबसाइट पर प्रदर्शित होने की तारीख से 15 दिनों के भीतर अपनी टिप्पणियां निम्नलिखित पते पर भेजें। उप समूह कमेटी की बैठक में उपर्युक्त उपकरण के गुणात्मक आवश्यकता/परीक्षण निर्देशों को अंतिम रूप देने पर विचार किया जा रहा है।

सहायक महानिरीक्षक/तकनीकी

केन्द्रीय औद्योगिक सुरक्षा बल निदेशालय

ब्लॉक 13 सी.जी.ओ. काम्प्लेक्स, लोधी रोड, नई दिल्ली

ईमेल : aigtech@cisf.gov.in

Digitally signed by
पाटिल अभय आनंद
PATIL ABHAY ANAND,
उप कमाण्डेन्ट/तकनीकी
DEPUTY COMMANDANT/TECH,
FHQ NEW DELHI,
03-11-2025

Copy to:-

? DRAFT QUALITATIVE REQUIREMENTS OF COMPUTED TOMOGRAPHY X-RAY

SN	Parameter
A. PHYSICAL	
1	Tunnel Size (W X H) ■ (600 to 700 mm) X (400 to 500 mm)
2	Maximum object size (W x H) - 600mm x 400mm
3	Maximum object length - 1000mm
4	Conveyor load capacity (Distributed) -100 kg or more
5	Overall dimensions - Not more than 3800mm (L) x 1660mm (W) x 1760mm (H)
6	Noise level - less than 70 dB (A)
7	Conveyor Belt speed - 0.15 m/s or more
8	Operating Temperature Range: -5°C to 50°C
9	Storage Temperature Range: -15°C to 60°C
10	Throughput - 350 Tray per hour or more with minimum tray size 650 x 550 mm
11	Should operate on 230 VAC 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170 V to 280 V and Frequency fluctuations +/- 5%
B. IMAGING	
1	CT X-Ray Inspection system provides high resolution 3D image. System should provide both 2D and 3D image processing in combination.
2	The system should be able to produce clear images on Dual Colour monitors LED Colour monitor minimum 24" size with minimum of 1280 X 1024 pixels. An additional monitor of the same specifications shall be provided.
3	Penetration: should be of 25 MM or more thickness of Steel or more
4	Resolution: The machine should be able to display single un-insulated tinned copper wire of 36 SWG minimum for 3D view and 40 SWG minimum for 2D view.
5	Zoom facility should be available to magnify the chosen area of an image sixteen times (16 X) or more. Image feature shall be keyboard controllable.
6	The machine should be Food & Film-safe. In other words, photographic films must not be damaged due to X-Ray examination.
7	The System must provide cut less image processing and detection without the need to reverse the conveyor belt.
8	Machine should have variable colour or material stripping to facilitate the operator to monitor images of organic materials for closer scrutiny.
9	The machine should be so designed that software enhancement can be easily implemented to take care of new technique in image processing and pattern recognition
C. STANDARD	
1	Control desk with secure housing and locking provision should be available.
2	The operator personal identification number can be entered through keyboard.
3	Lead impregnated safety screens should be available at either end of the tunnel.
4	All software features of machine should be activated (online) and password protected.
5	System should have online recording facility and images can be recorded in Hard disk/USB Disk/Optical Drive. The recording should be retained for minimum 30 days.
6	Idle roNersto be provided at either ends of the tunnel to facilitate placing of baggage at thfe inpyt and output points.

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7	If the machine fails to penetrate a particular item, then an alarm (visual and audio both) should be generated to notify the operator.
8	Machine should be capable of recalling 100 or more previous images (configurable up to 100 images). A reject bag image shall be transmitted to an additional monitor erected at the physical check point to facilitate the screener and also increase through put.
9	The system must provide 4 X-Ray on and power on lamps at 4 corners of the mechanical housing and/ suitable visual indication for 'X-Ray ON' and 'Power On' On the machine to be provided, to be visible from all corner.
10	The system must be equipped with encoded interlock switches.
11	Radiation safety: The design must meet the requirement of AERB approved standards of X-Ray radiation protection. External Radiation dose < 0.1 mR/hr (ip Sv/hr (As per rule/regulation in India)
D. DETECTION FEATURES	
1	The system must be delivered with a feature for the automated detection of weapons. This feature must be able to detect at least handguns (pistols, revolvers), gun parts, folded knives (closed and open), fixed-blade knives (min. length 6 cm) and ammunition further "suspicious material" shall be user defined. The detection capabilities must be based on software applying artificial intelligence / deep learning algorithms. The feature must detect in real-time means the results must be shown to the operator while the X-Ray image is still on the screen without stopping the conveyor of the X-Ray. The application of artificial intelligence/deep learning algorithms can be applied provided there is no interaction of the system with the internet.
2	System has the ability to auto -alarm for suspicious items and mark them in the image.
3	The system must provide automated explosives detection capabilities by determining both atomic number and density. All other suspicious items such high density material and narcotics should be displayed.
E. ATRS FEATURES (The CT machine should be integrable with ATRS if required by the user agency. The features of the same should be:-)	
1	The system must have the ability to be equipped with a RFID reader integrated into the tunnel extension at the entrance of the system.
2	The system must have the ability to be equipped with sub frames to adapt the conveyor height of the CT system to conveyor height of the ATRS of 80Dmm to 940mm.
3	The system must have the ability to connect an additional Image Evaluation Workstation for increased throughput.
4	The system must have the ability to connect up to 2 Recheck Workstations for increased alarm resolution.
5	With integration in ATRS, the system must provide a camera at the entrance to take picture of baggage. The picture to be attached with its corresponding X-Ray image for image evaluation and alarm resolution at recheck.
6	With integration in ATRS, the systems in feed conveyor must stop automatically in case of a configurable number of unprocessed images in queue.
7	XBIS Computer Unit shall be provided with an independent UPS of appropriate capacity to support backup time of minimum 30 minutes.
8	The X-BIS should be mounted on Heavy Duty Castors for ease of movement.
9	Provision of remote screening facilities.

F. CERTIFICATION	
1	Internationally certified ISO 9001 quality standard shall have been maintained by the manufacturer.
2	The system must meet the requirements of ISO/IEC 27001 "Information technology Security techniques Information security management systems Requirements".
3	The system must meet the requirements of ISO 14001 "Environmental management systems Requirements with guidance for use"
4	The CT machine deployed should be certified and approved by TSA/ECAC Standard 3 or any other specified govt, agency in India or accredited testing agency as prescribed by the user agency/regulator or, otherwise, upon satisfaction of the user agency based on successful trials. However, it is mandatory to avail certificate within 6 months once an accredited national testing agency is established.
5	Safety: The offered machines must comply with requirements of health and safety regulations with regard to radiation hazards. Before installation of machine, the supplier/ manufacturer should furnish NOC from Atomic Energy Regulatory Board of India regarding Radiation safety, after every five years.
6	Safety: The offered machines must comply with requirements of health and safety regulations with regard to mechanical and electrical hazards. Before installation of machine, the supplier/ manufacturer should furnish safety certification from National/International approved labs.
G. ADDITIONAL FEATURES	
1	Anti-rodent and dust-proof cover must be provided.
2	Emergency Stop switch to be provided at entry & exit side and on the operator console.
3	The system must provide a fan-based cooling system, no external water cooling allowed.
4	The system must allow reversing the conveyor belt in case of baggage jams.
5	Resetting time, Stop and start time (Less than 05 minutes).
6	The system should be able to use in a standalone configuration. The system must be equipped with a standard interface board for integration into tray return systems (TRS).
7	System should have both modes of operations 100% screening mode and Automatic Detection mode.
8	The Graphical User Interface (GUI) of the system must be designed for fast and intuitive usability, enhancing security.
9	The system must provide status information of the CT system for Emergency stop, Power On, Interlock at the operator workplace in standalone mode.
10	The system's gantry must be designed for at least 10 years' operation.
11	One operator manual shall be provided with each machine.
12	Comprehensive Diagnostic software tools.
13	The Threat Image Projection (TIP) system software to be incorporated in all machines as per details given in "Annexure-I".
14	The manufacturer shall provide one set of Standard Test Piece (STP) per machine as per "Annexure-H" for checking the serviceability of the machine by the operator. The STP shall be approved by a Government-accredited Test Laboratory/Organization. The OEMs/ Manufacturers should provide their own STP as per TSA and ECAC.

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THREAT IMAGE PROJECTION (TIP)

1. TIP Software facility shall be incorporated in the offered X-Ray machines to assist supervisors in testing the operator alertness and training X-Ray screeners to improve their ability in identifying specific threat object. The system will create a threat object and the same will be super-imposed on monitor screen while a bag is being screened.
2. To acknowledge that the operator has seen the false object, operator must press the control Panel key that will cause the computer-generated threat object to disappear from x-rayed bag image on the VDU screen. Each operator's action shall be recorded in the hard disc of the computer for the auditing purpose by the supervisor or other authorised person.
3. **Design of the system:** TIP software should be compatible with other X-Ray technologies such as Automatic Reject Unit, 3D View X-Ray screen technologies, Automatic Threat Recognition System etc. All X-Ray image functions must be available at the same time along with the TIP.

4. Image Library:

- a) The TIP facility should have an image library. The library should have 100 minimum different images from each category i.e. IEDs, Detonators, Explosives, Guns & firearms, other Prohibited articles. The system shall have facility to expand the library to incorporate additional images by user without assistance of the manufacturer as and when required.
- b) The image library should contain images of threats at different orientations-both plane and end-on orientation should be used. Although these will be assigned different file names and references, it must be possible to cross-reference these as the same threat. All threat Image Projection images must be realistic, representative and non-distinguishable from real threat items.

5. Time Interval:

- a) Programming facility shall be available to project threat images randomly. The time period for threat image as well as image mix in percentage shall be user programmable. Preferably image mix in software setting for random selection of images should be 40% images of explosive devices or detonators, 30% of fire arms & 30% of knives & other prohibited articles.
- b) Once the screener has responded to identify the computer-generated threat image, it should remain on the screen for a pre-defined user programmable time for **analyses. The image should be highlighted, upon identification, and feedback message shall be visible to the screener.**

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6. System Administration:

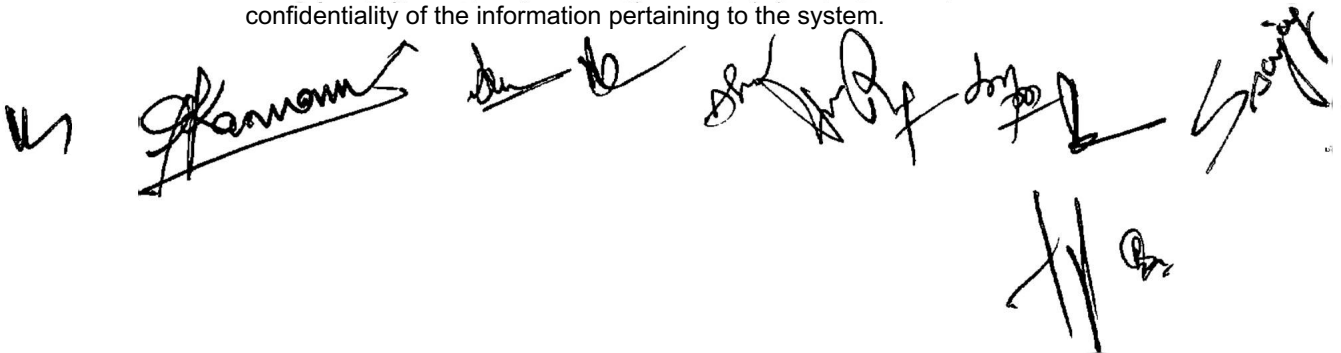
- a) The threat image projection facility shall have details of user data-base such as Organization name, Screener name, Organization, user ID number.
- b) Access to start-up Menu should be restricted only to the authorised individuals. A log-in procedure by means of 'Password' or 'security key' could achieve restricted access to each of the comment. The log-in procedure should not take longer than 20 seconds. The system should have facility to bypass the TIP facility, if programmed so by the System Administrator. It is to be ensured that the TIP software shall not be hindrance to normal functioning of X-Ray Machines.
- c) When the operator logs-in or logs-out, message should be displayed on XBIS Display Monitor Screen to confirm that he/she has been correctly logged-in or logged out.

7. Feed Back Report:

- a) The Threat Image Projection should be capable of giving feedback "HIT, MISS or FALSE ALARM" message. No message will be presented if a screener correctly passed as clear bag.
- b) A "HIT" message to be presented when a screener has correctly identified a Threat Image Projection image. A "MISS" message shall be presented when screener fails to identify the Threat Image Projection Image.
- c) A "False Alarm" message shall be given when screener incorrectly indicate Threat Image Projection image when in fact no Threat Image Projection is present. The feedback should clearly indicate in a screen that a TIP object has been correctly identified/ TIP object has been missed/no TIP object was present. The information should be recorded in the database.
- d) Different colour coding shall be used for feedback to the Screener. It is recommended that Colour Code "Red for MISS", Green for HIT and "Yellow to False Alarm or interrupt" be used.
- e) The system shall automatically prepare the daily log of events for each shift and for each Screener performance.
- f) TIP log shall include particulars of Organization, XBIS, Name of Screener, Time & **date of threat image, whether threat image was successfully identified or missed** etc.

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- g) The report on Threat Image Projection system may have date and time (From-To) as ⁴ per requirement, Screener particulars, and decision/outcome i.e. MISS, HIT or False alarm in percentage as well in absolute numbers, number of bags screened, categories such as explosive devices knife or weapon etc.
- h) As a standard practice, daily/weekly/ monthly report shall be retrieved. Report shall be for any given time and period, as per command.
- i) All data should be stored on the system for a minimum of two months after it has been downloaded. No individual, regardless of access rights to the Threat Image Projection components would delete or amend any of Threat Image Projection data or time i.e. Threat Image Projection data on the actual X-Ray machine will be read only file.
- j) All the system should be maintained by the OEMs or entities certified by them.
- k) The system should not be connected or accessed through internet by the OEM for any purpose including remote diagnosis.
- l) A non-disclosure agreement (NDA) is to be signed by OEM with Buyer to affect the confidentiality of the information pertaining to the system.

A series of handwritten signatures and initials in black ink, arranged horizontally. From left to right, there is a small 'u', a signature that appears to be 'Kannan', a signature that appears to be 'du to', a signature that appears to be 'shw By dya', a signature that appears to be 'L', a signature that appears to be 'Sant', and a set of initials 'H B'.

STANDARD TEST PIECES (STPs)

1. The manufacturer shall provide one set of STP per machine for checking serviceability of the machine by the operator. This should be approved by Government accredited Test Laboratory/ Organization. The OEMs/Manufacturers should provide their own STP as per TSA and ECAC.

A. SINGLE WIRE RESOLUTION (TEST No. 1):

The requirement is to display **36 SWG wire not covered by step-wedge**. A set of un-insulated tinned copper wire of size 26, 30, 36, 38 and 40 SWG is placed on Perspex sheet. The wires are laid out in 'S' shaped curves. The wires are placed behind varying thickness of aluminium. Metallic marker should be provided using high-density material, so that SWG numbers in the image displayed on VDU /Monitor are clearly visible.

B. USEFUL PENETRATION (TEST No. 2):

The test defines what level of details can be seen behind a thickness of known material. The STP-1 has different gauges of wire behind varying thickness of aluminium. The requirement for this test is that the **26 SWG wire is seen under second step wedge (6/16")**.

C. MATERIAL DISCRIMINATION (TEST No. 3):

The requirement is that different colours be allocated to the sample of organic and inorganic substances. With multi-energy X-Ray it should be possible to distinguish between materials of different average atomic number. This means that organic and inorganic substances can be differentiated. The use of sugar and salt samples encapsulated on the test piece and various materials used in the construction of STP will check the material discrimination facility.

D. SIMPLE PENETRATION (TEST No. 4):

The requirement is that the lead be visible beneath **25 mm of Steel**. This test defines what thickness of steel the machine should be able to penetrate. The steel step wedge on the STP-1 has steps of 2 mm from 16 mm to 30 mm with a lead strip to check that the machine is above or below the requirement.

E. SPATIAL RESOLUTION (TEST No. 5):

The requirement is that a vertical and horizontal grating to be seen. This test defines the ability of the system to distinguish and display objects which are close together. The STP-1 has 16 copper gratings at right angle to each other.

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F. THIN METAL IMAGING (TEST No. 6):

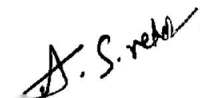
The requirement is to image steel 0.1 cm thick. This tests the machine's ability to image thin metal. A number of thin metals strips of various thicknesses are placed in a row.



(Mahendra)
Nk/Sub, Assam Rifles



(SenfaVan T)
AC1/NSG



(Sandeep Reddy)
AC, CRPF



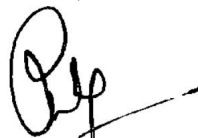
(Pankaj Thapa)
AC, SSB



(Nemichand)
DC, ITBP



(Aniruch Singh, DC)
IGI Airport, CISF
(Member-II)



(Abhajir Patil)
DC/TECH, FHQ, CISF
(Co-opted Member)



(Aji.K.K)
SP(MED), BPR&D



XSanJay Singh)
2IC (ADM), BSF



(Bikash Ghose)
Scientist-G, DRDO
(Co-opted Member)



(V.V.S Gautam)
AIG/NZ-AP HQ, CISF
(Member-I)



(P'tavis Ranjan, IPS)

DRAFT TRIAL DIRECTIVES OF COMPUTED TOMOGRAPHY X-RAY (CTX)

SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
PHYSICAL		
1	Tunnel Size (W X H) - (600 to 700 mm) X (400 to 500 mm)	To be physically checked by the BOO through measuring instrument.
2	Maximum object size (W x H) - 600mm x 400mm	To be physically checked by the BOO through measuring instrument.
3	Maximum object length - 1000mm	To be physically checked by the BOO through measuring instrument.
4	Conveyor load capacity (Distributed) -100 kg or more	To be physically checked.
5	Overall dimensions - Not more than 3800mm (L) x 1660mm (W) x 1760mm (H)	To be physically checked.
6	Noise level - less than 70 dB (A)	An OEM certificate be obtained from the Vendor
7	Conveyor Belt speed - 0.15 m/s or more	To be physically checked by the BOO through Tachometer.
8	Operating Temperature Range: -5°C to 50°C	A certificate from a NABL accredited or any internationally accredited organization be obtained from the Vendor.
9	Storage Temperature Range: -15°C to 60°C	A certificate from a NABL accredited or any internationally accredited organization be obtained from the Vendor.
10	Throughput - 350 Tray per hour or more with minimum tray size 650 x 550 mm	To be physically checked.
11	Should operate on 230 VAC 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170 V to 280 V and Frequency fluctuations +/-5%	Plug the machine through electrical component and check the operation of the machine within the specified range of power supply. To be physically checked.
IMAGING		
1*	CT X-Ray Inspection system provides high resolution 3D image. System should provide 2D and 3D image processing in combination.	To be physically checked.

SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
2	The system should be able to produce clear images on Dual Colour monitors LED Colour monitor minimum 24" size with minimum of 1280 X 1024 pixels. An additional monitor of the same specifications shall be provided.	To be physically checked.
3	Penetration: should be of 25 MM or more thickness of Steel or more	To be physically checked.
4	Resolution: The machine should be able to display single un-insulated tinned copper wire of 36 SWG minimum for 3D view and 40 SWG minimum for 2D view.	To be physically checked.
5	Zoom facility should be available to magnify the chosen area of an image sixteen times (16 X) or more. Image feature shall be keyboard controllable.	To be physically checked.
6	The machine should be Food & Film-safe. In other words, photographic films must not be damaged due to X-Ray examination.	An OEM certificate be obtained from the Vendors.
7	The System must provide cut less image processing and detection without the need to reverse the conveyor belt.	To be physically checked.
8	Machine should have variable colour or material stripping to facilitate the operator to monitor images of organic materials for closer scrutiny.	To be physically checked.
9	The machine should be so designed that software enhancement can be easily implemented to take care of new technique in image processing and pattern recognition	To be physically checked.
STANDARD		
1	Control desk with secure housing and locking provision should be available.	To be physically checked by BOO.
2	The operator personal identification number can be entered through keyboard.	To be physically checked by BOO.
3	Lead Impregnated safety screens should be available at either end of the tunnel.	To be physically checked by BOO. An OEM certificate be obtained from the vendor.

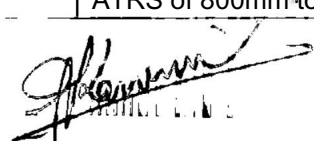
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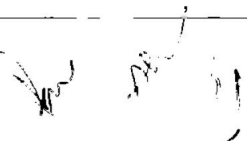
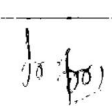
SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
4	All software features of machine should be activated (online) and password protected.	To be physically checked by BOO.
5	System should have online recording facility and images can be recorded in Hard disk/USB Disk/Optical Drive. The recording should be retained for minimum 30 days.	To be physically checked by BOO.
6	Idle rollers to be provided at either ends of the tunnel to facilitate placing of baggage at the input and output points.	To be physically checked by BOO.
7	If the machine fails to penetrate a particular item, then an alarm (visual and audio both) should be generated to notify the operator.	To be physically checked by BOO.
8	Machine should be capable of recalling 100 or more previous images (configurable up to 100 images). A reject bag image shall be transmitted to an additional monitor erected at the physical check point to facilitate the screener and also increase through put.	To be physically checked by BOO.
9	The system must provide 4 X-Ray on and power on lamps at 4 corners of the mechanical housing and/ suitable visual indication for X-Ray ON' and 'Power On' on the machine to be provided, to be visible from all corner.	To be physically checked by BOO.
10	The system must be equipped with encoded interlock switches.	To be physically checked by BOO.
11	Radiation safety: The design must meet the requirement of AERB approved standards of X-Ray radiation protection. External Radiation dose < 0.1 mR/hr (1p Sv/hr (As per rule/regulation in India)	AERB certificate be obtained from the Vendors.

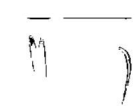
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SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
DETECTION FEATURES		
1	The system must be delivered with a feature for the automated detection of weapons. This feature must be able to detect at least handguns (pistols, revolvers), gun parts, folded knives (closed and open), fixed-blade knives (min. length 6 cm) and ammunition further "suspicious material" shall be user defined. The detection capabilities must be based on software applying artificial intelligence / deep learning algorithms. The feature must detect in real-time means the results must be shown to the operator while the X-Ray image is still on the screen without stopping the conveyor of the X-Ray. The application of artificial intelligence/deep learning algorithms can be applied provided there is no interaction of the system with the internet. The application of artificial intelligence/deep learning algorithms can be applied provided there is no interaction of the system with the internet.	To be physically checked by BOO.
2	System has the ability to auto -alarm for suspicious items and mark them in the image.	To be physically checked by BOO.
3	The system must provide automated explosives detection capabilities by determining both atomic number and density. All other suspicious items such High Density material and narcotics should be displayed.	To be physically checked by BOO.
ATRS FEATURES (The CT machine should be integrable with ATRS if required by the user agency. The features of the same should be:-)		
1	The system must have the ability to be equipped with a RFID reader Integrated Into the tunnel extension at the entrance of the system.	To be physically checked by BOO.
2	The system must have the ability to be equipped with sub frames to adapt the conveyor height of the CT system to conveyor height of the ATRS of 800mm to 940mm.	To be physically checked by BOO.

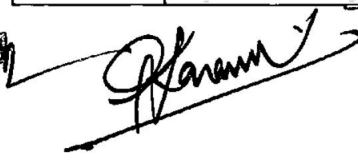


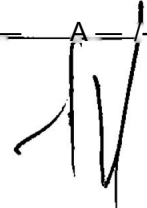




SL NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
3	The system must have the ability to connect an additional Image Evaluation Workstation for increased throughput.	To be physically checked by BOO.
4	The system must have the ability to connect up to 2 Recheck Workstations for increased alarm resolution.	To be physically checked by BOO.
5	With integration in ATRS, the system must provide a camera at the entrance to take picture of baggage. The picture to be attached with its corresponding X-Ray image for image evaluation and alarm resolution at recheck.	To be physically checked by BOO.
6	With integration in ATRS, the systems in feed conveyor must stop automatically in case of a configurable number of unprocessed images in queue.	To be physically checked by BOO.
7	XBIS Computer Unit shall be provided with an independent UPS of appropriate capacity to support backup time of minimum 30 minutes.	To be physically checked by BOO.
8	The X-BIS should be mounted on Heavy Duty Castors for ease of movement.	To be physically checked by BOO.
9	Provision of remote screening facilities.	To be physically checked by BOO.
CERTIFICATION		
1	Internationally certified ISO 9001 quality standard shall have been maintained by the manufacturer.	Certificate be checked by BOO.
2	The system must meet the requirements of ISO/IEC 27001 "Information technology Security techniques Information security management systems Requirements".	Certificate be checked by BOO.
3	The system must meet the requirements of ISO 14001 "Environmental management systems Requirements with guidance for use"	Certificate be checked by BOO.
4	The CT machine deployed should be certified and approved by TSA /ECAC standard 3 or any other specified govt, agency in India or accredited testing agency as prescribed by the user agency/regulator or, otherwise, upon satisfaction of the user agency based on successful	Certificate be checked by BOO.





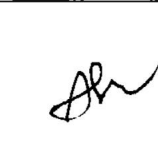


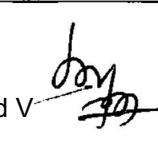

SL NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
	trials. However, it is mandatory to avail certificate within 6 months once an accredited national testing agency is established.	
5	Safety: The offered machines must comply with requirements of health and safety regulations with regard to radiation hazards. Before installation of machine, the supplier/ manufacturer should furnish NOC from Atomic Energy Regulatory Board of India regarding Radiation safety, after every five years.	AERB Certification to be checked by BOO.
6	Safety: The offered machines must comply with requirements of health and safety regulations with regard to mechanical and electrical hazards. Before installation of machine, the supplier/ manufacturer should furnish safety certification from National/International approved labs.	An OEM certificate be obtained from the vendor.
ADDITIONAL FEATURES		
1	Anti-rodent and dust-proof cover must be provided.	To be physically checked by BOO.
2	Emergency Stop switch to be provided at entry & exit side and on the operator console.	To be physically checked by BOO.
3	The system must provide a fan-based cooling system, no external water cooling allowed.	To be physically checked by BOO.
4	The system must allow reversing the conveyor belt in case of baggage jams.	To be physically checked by BOO.
5	Resetting time, Stop and start time (Less than 05 minutes).	To be physically checked by BOO.
6	The system should be able to use in a standalone configuration. The system must be equipped with a standard interface board for integration into tray return systems (TRS).	An OEM certificate be obtained from the Vendor.
7	System should have both modes of operations 100% screening mode and Automatic Detection mode.	To be physically checked by BOO.
8	The Graphical User Interface (GUI) of the system must be designed for fast and Intuitive usability, enhancing security.	To be physically checked by BOO.



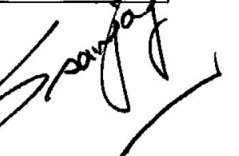
SL NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
9	The system must provide status information of the CT system for Emergency stop, Power On, Interlock at the operator workplace in standalone mode.	To be physically checked by BOO.
10	The system's gantry must be designed for at least 10 years' operation.	OEM certificate be obtained.
11	One operator manual shall be provided with each machine.	To be physically checked by BOO.
12	Comprehensive Diagnostic software tools.	To be physically checked by BOO.
13	The Threat Image Projection (TIP) system software to be incorporated in all machines as per details given in "Annexure-I".	To be physically checked by BOO.
14	The manufacturer shall provide one set of Standard Test Piece (STP) per machine as per "Annexure-II" for checking the serviceability of the machine by the operator. The STP shall be approved by a Government-accredited Test Laboratory/Organization. The OEMS/ Manufacturers should provide their own STP as per TSA and ECAC.	BOO shall physically verify the STP on the machine for serviceability and check its approval certificate







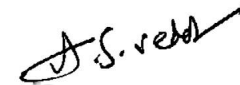




(Mahendra)

Nk/Sub, Assam Rifles


(Senra^n T)

AC1/NSG


(Sandeep Reddy)

AC, CRPF


(Pankaj Tripathi)

AC, SSB


(Nemichand)

DC, ITBP


(Anirudh Singh, DC)

IG1 Airport, CISF

(Member-II)


(Abhay Patil)

DC/TECH, FHQ, CISF

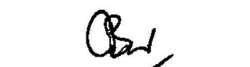
(Co-opted Member)


(AIL K.K)

SP(MOD), BPR&D


(Sanjay Singh)

2IC (ADM), BSF


(Blkash Ghose)

Scientist-G, DRDO

(Co-opted Member)


(V.V.S Gautam)

AIG/NZ-AP HQ, CISF

(Member-I)


(Praveer Ranjan, IPS)

Special Director General/APS HQ

Chairman of the Board

DRAFT QUALITATIVE REQUIREMENTS OF X-RAY BAGGAGE

INSPECTION SYSTEM DUAL VIEW

SL. NO.	Technical Specification
1.	Each XBIS shall be equipped with two individual independent X-Ray generators with dual View Image.
2.	Tunnel Size - Minimum 60 cm W (width) x Minimum 40 cm H (Height).
3.	Conveyor belt speed should be fixed within the range of 0.18 to 0.3 meters per second, as per user requirements. Conveyor movement bidirectional
4.	All machines should operate on 230 V AC, 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170 V to 260 V and frequency fluctuations +/- 5% with stabilizer.
5.	Conveyor Capacity-160 kg or more
6.	Through put should be 400 bags per hour or more
7.	In case of defective diode arrays, scanning should be disabled and error message should be displayed on the screen.
8.	X-Ray Voltage 160 KV to 180 KV
9.	Duty Cycle-100%
10.	X-Ray Source/Generator-OEM should provide maintenance and support for a period of 10 years.
11.	The X-ray beam divergence should be such that the complete image at maximum size of bag is displayed without corner cuts.
12.	The radiation level should not exceed accepted health standard (0.1m R/Hr at a distance of 5 CM from external housing). Relevant certificate from AERB
13.	The operating temperature normally should be -5°C to 50°C
14.	Storage temperature: -20°C to 60°C
15.	Humidity- 90% non-condensing
16.	Resolution: The machine should be able to display single un-insulated tinned copper wire of 40-SWG.
17.	Penetration should be 35 mm thickness of steel or more
18.	Continuous Electronic Zoom facility should be available to magnify the chosen area of an image up to sixty-four times (64X). Image features shall be keyboard controllable.
19.	The system should be able to produce clear images on Dual Colour monitors LED Colour monitor minimum 24" size with minimum of 1280 X1024 pixels.
20.	The machine should have features of Multi-energy X-ray imaging facility where materials of different atomic number will be displayed in different colours to distinguish between organic and inorganic materials. With this method to distinguish high density organic materials including explosives. Machine should have variable colour or materials stripping to facilitate the operator to monitor images of organic materials for closer scrutiny. All suspicious items (Explosives, High density, material narcotics) should be displayed in one mode and that should be on line.
21.	Radiation Safety The machine must comply with requirements of health and safety regulations with regard to mechanical, electrical and radiation hazards. Before installation of the machine, the supplier/manufacturer should furnish NOC/relevant certificate from Atomic Energy Regulatory Board (AERB) of India regarding radiation safety after every three years.
22.	The company manufacturing the equipment should have ISO certification for manufacturing and servicing of X-ray Screening machines.

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23.	Film/Food - Safety Guaranteed safety for high-speed films up to ISO1600. The machines should be film/food safe. In other words, photographic films and food must not be damaged due to X-Ray examination.
24.	Machine should be properly sealed from all the sides for pest proof. Anti-rodent and Dust proof cover is to be provided for covering when system is not in use.
25.	Facility for variable contrast must be incorporated to allow enhancement of lighter and darker portion of the image.
26.	The machine should be so designed that software enhancement can be easily implemented to take care of new technique in image processing and pattern recognition.
27.	All models should have software-controlled diagnosis report facility and should include following information I. XBIS Make/Model/Sr. No. II. Software/ Firmware/Algorithm Version Number III. Status/Values of major Power Supply Voltages IV. Generator Voltage (X-Ray ON/X-Ray OFF) V. Generator Anode Current (X-Ray ON/X-Ray OFF) VI. Generator Heater Current (X-Ray ON/X-Ray OFF) VII. Diode Array (Raw/Calibrated) Response (X-Ray ON/X-Ray OFF) VIII. Grand total number of Bags scanned IX. XBIS fault Log X. XBIS Photoelectric Light Barrier (Tunnel Entry/Exit) Status XI. Emergency switches status
28.	All software features of machine should be activated and password protected.
29.	Machine should be capable for recalling 100 or more previous images. Depending upon the user requirement, rejected bag image shall be transmitted to an additional monitor erected at the physical check point to facilitate the screener and also increase throughput.
30.	It should have the capability of archiving up to 2,00,000 images with date & time stamp, The quality of the images should remain intact when retrieved and viewed on any external device.
31.	Control desk with security housing and locking provision should be available. The operator personal identification number can be entered through keyboard along with generation of log.
32.	Facility of image enhancement should be available.
33.	All models should have online recording facility and images can be recorded in USB/Electronic storage devices. The recording should be retained for minimum 30 days.
34.	Lead impregnated safety screens should be available at either ends of the tunnel. This should be covered by relevant AERB certificate. Idle rollers to be provided at either ends of the tunnel to facilitate placing of baggage at input and output points.
35.	System should work on one software only. All software features should be controlled from key board/ mouse/ touch screen of machine only. Control functions should be user friendly. To enable / disable the software features, system should not be rebooted. Control Software (Algorithms, TIP Library etc.) should be cybersecure and should be VAPT certified by a CERT-IN empanelled lab.
36.	If the machine fails to penetrate a particular item, then an alarm (video and audip both) should be generated to notify the operator.
37.	The threat image projection (TIP) system software to be incorporated in all X-BIS operation.
38.	Copy of all software including X-Ray Software with recovery CD must be provided.

39.	Operational Training- Operating staff has to be provided free training.
40.	Operating & service manual shall be provided with each machine in both Hard and Soft modes.
41.	Other Features a) Edge & variable edge enhancement. b) Inverse Video c) Set up time not more than 10 minutes d) Pseudo colour e) Date & Time display.
42.	Minimum Computer Configuration: - 1. CPU: Should be able to deliver the output to meet the specifications mentioned as above. 2. SSD: 500 GB or Better 3. Mouse: USB Optical 4. Ports: 8 USB Ports (with at least 2 in front), 2 HDMI Port, audio ports for microphone and headphone in front. 5. CD-R/RW Drive: DVD Writer. 6. Networking facility: 10/100/1000 on board integrated Network Port. The system should not be connected or assessed via remote connection by the OEM for any purpose including remote diagnosis.
43.	UPS: 3 KVA or better online with back-up time of J4 hour to whole system.
TIPS Feature	
	Threat Image Projection
1.	Tip software facility shall be incorporated in the offered X-ray machine to assist supervisors in testing the operator alertness and training X-ray screeners to improve their ability in identifying specific threat object. The system will create a threat object and the same will be superimposed on the monitor screen while a bag is being screened. To acknowledge that the operator has seen the false object, operator must press the control panel key that will cause the computer-generated threat object to disappear from x-rayed bag image on the VDU screen. Each operator's action shall be recorded in the hard disc of the computer for the auditing purpose by the supervisor or other authorized person.
	DESIGN OF THE SYSTEM:
2.	Tip software should be compatible with other X-ray technologies such as automatic reject unit. Dual X-Ray screen technologies, automatic treat recognition system etc. All x-ray image functions must be available at the same time along with the TIP.
	IMAGE LIBRARY
3.	The image library should have an image library containing at least 100 explosives devices, 100 knives and 100 firearms in various sizes, shapes, locations and orientations. However, the system shall have facility to expand the library to incorporate additional images by user without assistance of the manufacture as and when required.
	Technical Specifications
4.	The image library should contain images of threats at different orientations both plan and end on orientation should be used. Although these will be assigned different file names and references, it must be possible to cross-reference these as the same threat. All threat image Projection images must be realistic, representative and non-distinguishable from real threat items.
	TIME INTERVAL

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5.	Programming facility shall be available to project threat images randomly. The time period for threat image as well as image mix in percentage shall be user programmable e.g. software shall select 40% images of explosive devices, 35% of fire arms & 25% knives or random etc.
6.	Once the screener has responded to identity of the computer-generated threat image, it should remain on the screen for a predefined user programmable time for analysis. The image should be highlighted, upon identification, and feedback message shall be visible to the screener.
SYSTEM ADMINISTRATION	
7.	The threat image projection facility shall have details of user data-base such as Department name, screener name, Organization, User ID Number, level of access such as screener, administrator, Maintenance & Password etc.
8.	Access to start up menu should be restricted only to the authorized individuals. A log-in procedure by means of Password" or "Security Key" could achieve restricted access to each of the comment. The log-in procedure should not take longer than 20 seconds. The system should have facility to by pass the TIP facility, if programmed so by the system administrator. It is to be ensured that the TIP software shall not be hindrance to normal functioning of x-ray machines.
9.	When the operator logs-in or logs-out message should be displayed on x-ray BIS VDU Screen to confirm thatthe/she has been correctly logged-in or logged-out.
FEED BACK REPORT	
10.	The threat image Projection should be capable of giving feedback "HIT, MISS or FALSE I ALARM" message. No message will be presented if a screener correctly passed as clear i bag.
11.	A "HIT" message to be presented when a screener has correctly identified a Threat 1 image Projection Image. A "MISS" message shall be presented when screener fails t;o identify the TIP image. A "False Alarm" message shall be given when screener incorrectly indicate TIP image when in feet no threat image projection is present. The feedback should clearly indicate in a screen that a tip object has been correctly identified/tip object has been missed/that a TIP object has been missed/noTIP object j was present. Information should be recorded in the database.
12.	Different colour coding shall be used for feedback to the Screener. It is recommended I that colour code "Red for MISS" Green for" HIT" and Yellow to False Alarm or interrupt' i be used.
13.	The system shall automatically prepare the daily log of events for each shift and for ■ each Screener performance. TIP log shall include particulars of Name of Screener, Time I & date of threat image, weather threat image was successfully identified or missed etc
14.	The report on Threat Image Projection system may have date and time (From - th) as j per requirement. Screener particulars, and decision/outcome i.e. MISS, HIT or False I Alarm in percentage as well in absolute numbers, numbers of bags screened, categories (such as explosives devices knife or weapon etc.
15.	As a standard practice, daily/weekly /monthly report shall be retrieved. Report shall be ■ for any given time and period, as per command.
16.	All data should be stored on the system for a minimum of two months after it has been down loaded. No individual, regardless of access rights to the Threat Image Projection components would delete or amend any of threat image Projection data ortipne i.e. I Threat Image Projection data on the actual X-ray machine will be read only file.
17.	X-B1S shall have automated online framing of suspicious material (e.g., Explosives, high density material, narcotics, etc.) for operator. This feature should be in real time 1 requiring no operator involvement. "Suspicious material" shall be user defined.

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18.	All the systems should be maintained by the OEMs or entities certified by them.
19.	The system should not be connected or accessed through internet by the OEM for any purpose including remote diagnosis.
20.	A non-disclosure agreement (NDA) is to be signed by the Buyer with OEM (Supplier) to affect the confidentiality of the information pertaining to the system.
21.	Service engineers of Indian origin will only be deputed by the OEM or entities authorized by them to maintain the system. Non-Indian engineers may be deputed for major breakdowns under Supervision.
ATRS FEATURES (The X-BIS dual view machine should be integrable with ATRS if required by the user agency. The features of the same should be:-)	
1.	The system must have the ability to be equipped with a RFID reader integrated into the tunnel extension at the entrance of the system.
2.	The system must have the ability to be equipped with sub frames to adapt the conveyor height of the X-BIS dual view machine to conveyor height of the ATRS of 800mm to 940mm.
3.	The system must have the ability to connect an additional Image Evaluation Workstation for increased throughput.
4.	The system must have the ability to connect up to 2 Recheck Workstations for increased alarm resolution.
5.	With integration in ATRS, the system must provide a camera at the entrance to take picture of baggage. The picture to be attached with its corresponding X-Ray image for image evaluation and alarm resolution at recheck.
6.	With integration in ATRS, the systems in feed conveyor must stop automatically in case of a configurable number of unprocessed images in queue.
7.	XB1S Computer Unit shall be provided with an independent UPS of appropriate capacity to support backup time of minimum 30 minutes.
8.	The X-BIS should be mounted on Heavy Duty Castors for ease of movement.
9.	Provision of remote screening facilities.

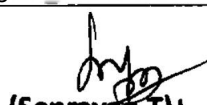

(T. Apendra)

Nk/Sub, Assam Rifles


(Pahkaf Thapa)
AC, SSB


(Abhay Patil)
DC/TECH, IFHQ, CISF
(Co-opted¹ Member)

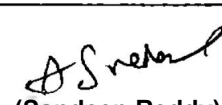
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(Bikash Ghose)
Scientist-G, DRDO
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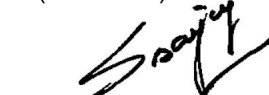

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DC, ITBP

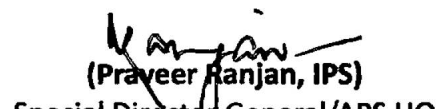

(Ajit Kulkarni)
SP(MOD), BPR&D

(L-
(V.V.SGautam)
AIG/NZ-AP HQ, CISF
(Member-I)


(Sandeep Reddy)
AC, CRPF


(Anirudh Singh, DC)
IGI Airport, CISF
(Member-II)


4Sanjay Singh)
2IC (ADM), BSF

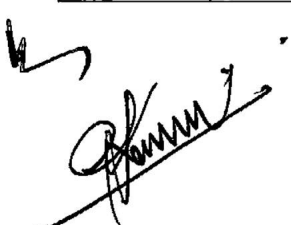
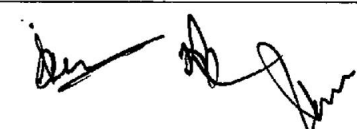
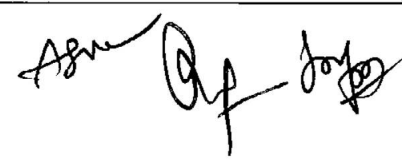
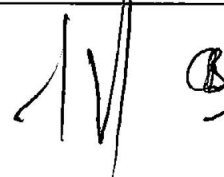

(Praveer Ranjan, IPS)
Special Director General/APS HQ
Chairman of the Board

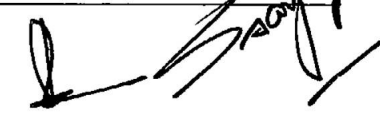
DRAFT TRIAL DIRECTIVES OF X-RAY BAGGAGE INSPECTION SYSTEM DUAL VIEW

SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
1.	Each XBIS shall be equipped with two individual independent X-Ray generators with dual View Image.	To be checked by the BOO. " - *>
2.	Tunnel Size - Minimum 60 cm W (width) x Minimum 40 cm H (Height).	To be physically checked by the BOO through measuring instrument.
3.	Conveyor belt speed should be fixed within the range of 0.18 to 0.3 meters per second, as per user requirements. Conveyor movement bidirectional	To be physically checked by the BOO through Tachometer.
4.	All machines should operate on 230 V AC, 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170 V to 260 V and frequency fluctuations +/- 5% with stabilizer.	Plug the machine through electrical component and check the operation of the machine within the specified range of power supply. To be physically checked.
5.	Conveyor Capacity-160 kg or more	To be physically checked.
6.	Through put should be 400 bags per hour or more	To be physically checked.
7.	In case of defective diode arrays, scanning should be disabled and error message should be displayed on the screen.	To be physically checked.
8.	X-Ray Voltage 160 KV to 180 KV	Plug the machine through electrical component and verify the X-Ray voltage on the screen of VDU.
9.	Duty Cycle-100%	An OEM certificate be obtained from the Vendor.
10.	X-Ray Source/Generator-OEM should provide support and maintenance for a period of 10 years.	An OEM certificate be obtained from the Vendor.
11.	The X-ray beam divergence should be such that the complete image at maximum size of bag is displayed without corner cuts.	Place the baggage in the tunnel of machine and see the image on VDU.
12.	The radiation level should not exceed accepted health standard (0.1m R/Hr at a distance of 5 CM from external housing). Relevant certificate from AERB	An AERB certificate should be obtained from the Vendors.
13.	The operating temperature normally should be -5°C to 50°C	A certificate from a NABL accredited or any internationally accredited organization be obtained from the Vendor.

SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
14.	Storage temperature: -20°C to 60°C	A certificate from a NABL accredited or any internationally accredited organization be obtained from the Vendor.
15.	Humidity- 90% non-condensing	A certificate from a NABL accredited or any internationally accredited organization be obtained from the Vendor.
16.	Resolution: The machine should be able to display single un-insulated tinned copper wire of 40-SWG.	Scan the CTP in operational condition of machine without operating any functional key, thereafter 40 SWG wire should be seen on the VDU.
17.	Penetration should be 35 mm thickness of steel or more	Scan the CTP in operational condition of machine and see the image of 35 mm thickness of steel on VDU.
18.	Continuous Electronic Zoom facility should be available to magnify the chosen area of an image up to sixty-four times (64X). Image features shall be keyboard controllable.	To be physically checked.
19.	The system should be able to produce clear images on Dual Colour monitors LED Colour monitor minimum 24" size with minimum of 1280 X 1024 pixels.	To be physically checked and an OEM certificate be obtained from the vendor.
20.	The machine should have features of Multi-energy X-ray imaging facility where materials of different atomic number will be displayed in different colours to distinguish between organic and inorganic materials. With this method to distinguish high density organic materials including explosives. Machine should have variable colour or materials stripping to facilitate the operator to monitor images of organic materials for closer scrutiny. All suspicious items (Explosives, High density, material narcotics) should be displayed in one mode and that should be on line.	Scan the CTP and checked the multi energy X-ray imaging facility through the multi energy test (i.e. sugar & salt) to distinguish inorganic & organic materials with the colours on the VDU.
21.	Radiation Safety The machine must comply with requirements of health and safety regulations with regard to mechanical electrical and radiation hazards. Before Installation of the machine, the supplier/manufacture should furnish NOC/relevant certificate from Atomic Energy Regulatory Board of India regarding radiation safety after every three years.	AERB certificate be obtained from the Vendors.

SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
22.	The company manufacturing the equipment should have ISO certification for manufacturing and servicing of X-ray Screening machines.	ISO certificate be obtained from the Vendors.
23.	Film/Food - Safety Guaranteed safety for high-speed films up to ISO1600. The machines should be film/food safe. In other words, photographic films and food must not be damaged due to X-Ray examination.	An OEM certificate be obtained from the Vendor.
24.	Machine should be properly sealed from all the sides for pest proof. Anti-rodent and Dust proof cover is to be provided for covering when system is not in use.	To be physically checked by BOO.
25.	Facility for variable contrast must be incorporated to allow enhancement of lighter and darker portion of the image.	Scan the baggage through X-Ray machine and operate the variable contrast key for checking of enhancement of darker portion of the image.
26.	The machine should be so designed that software enhancement can be easily implemented to take care of new technique in image processing and pattern recognition.	OEM certificate be obtained.
27.	All models should have software controlled diagnosis report facility and should include following information I. XBIS Make/ Model/ Sr. No. II. Software/ Firmware/Algorithm Version Number III. Status/Values of major Power Supply Voltages IV. Generator Voltage (X-Ray ON/X-Ray OFF) V. Generator Anode Current (X-Ray ON/X-Ray OFF) VI. Generator Heater Current (X-Ray ON/X-Ray OFF) VII. Diode Array (Raw/Calibrated) Response (X-Ray ON/X-Ray OFF) VIII. Grand total number of Bags scanned IX. XBIS fault Log X. XBIS Photoelectric Light Barrier (Tunnel Entry/Exit) Status XI. Emergency switches status	To be physically checked by the BOO.
28.	All software features of machine should be activated and password protected.	To be physically checked by the BOO.



SL NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
29.	Machine should be capable for recalling 100 or more previous images. Depending upon the user requirement, rejected bag image shall be transmitted to an additional monitor erected at the physical check point to facilitate the screener and also increase through put.	To be physically checked by the BOO.
30.	It should have the capability of archiving upto 2,00,000 images with date & time stamp. The quality of the images should remain intact when retrieved and viewed on any external device.	To be physically checked by the BOO.
31.	Control desk with security housing and locking provision should be available. The operator personal identification number can be entered through keyboard along with generation of log.	To be physically checked by the BOO.
32.	Facility of image enhancement should be available.	Scan the baggage through X-Ray machine and operate the image enhancement key available on the keyboard. To be physically checked by the BOO.
33.	All models should have online recording facility and images can be recorded in USB/Electronic storage devices. The recording should be retained for minimum 30 days.	To be physically checked by the BOO.
34.	Lead impregnated safety screens should be available at either ends of the tunnel. This should be covered by relevant AERB certificate. Idle rollers to be provided at either ends of the tunnel to facilitate placing of baggage at input and output points.	AERB certificate be obtained from the Vendors.
35.	System should work on one software only. All software features should be controlled from key board/ mouse/ touch screen of machine only. Control functions should be user friendly. To enable / disable the software features, system should not be rebooted. Control Software (Algorithms, TIP Library etc.) should be cybersecure and should be VAPT certified by a CERT-IN empanelled lab.	To be physically checked by the BOO.
36.	If the machine fails to penetrate a particular item then an alarm (video and audio both) should be generated to notify the operator.	To be physically checked by the BOO.
37.	The threat Image projection (TIP) system software to be Incorporated In all X-BIS operation.	To be physically checked by the BOO.

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SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
	programmable time for analysis. The image should be highlighted, upon identification, and feedback message shall be visible to the screener.	
	SYSTEM ADMINISTRATION	
7.	The threat image projection facility shall have details of user data-base such as Department name, screener name, Organization, User ID Number, level of access such as screener, administrator, Maintenance & Password etc.	To be physically checked by the BOO.
8.	Access to start up menu should be restricted only to the authorized individuals. A log-in procedure by means of Password" or "Security Key" could achieve restricted access to each of the comment. The log-in procedure should not take longer than 20 seconds. The system should have facility to bypass the TIP facility, if programmed so by the system administrator. It is to be ensured that the TIP software shall not be hindrance to normal functioning of x-ray machines.	To be physically checked by the BOO.
9.	When the operator logs-in or logs-out message should be displayed on x-ray BIS VDU Screen to confirm that the/she has been correctly logged-in or logged-out.	To be physically checked by the BOO.
	FEED BACK REPORT	
10.	The threat image Projection should be capable of giving feedback "HIT, MISS or FALSE ALARM" message. No message will be presented if a screener correctly passed as clear bag.	To be physically checked by the BOO.
11.	A "HIT" message to be presented when a screener has correctly identified a Threat image Projection Image. A "MISS" message shall be presented when screener fails to identify the TIP image. A "False Alarm" message shall be given when screener incorrectly indicate TIP image when in fact no threat image projection is present. The feedback should clearly indicate in a screen that a tip object has been correctly identified/tip object has been missed/ that a TIP object has been missed/no TIP object was present. Information should be recorded in the database.	To be physically checked by the BOO.

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SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
12.	Different colour coding shall be used for feedback to the Screener. It is recommended that colour code "Red for MISS" Green for " HIT" and Yellow to False Alarm or interrupt" be used.	To be physically checked by the BOO.
13.	The system shall automatically prepare the daily log of events for each shift and for each Screener performance. TIP log shall include particulars of Name of Screener, Time & date of threat image, weather threat image was successfully identified or missed etc.	To be physically checked by the BOO.
14.	The report on Threat Image Projection system may have date and time (From - to) as per requirement. Screener particulars, and decision/outcome i.e. MISS, HIT or False Alarm in percentage as well in absolute numbers, numbers of bags screened, categories such as explosives devices knife or weapon etc.	To be physically checked by the BOO.
15.	As a standard practice, daily/weekly /monthly report shall be retrieved. Report shall be for any given time and period, as per command.	To be physically checked by the BOO.
16.	All data should be stored on the system for a minimum of two months after it has been down loaded. No individual, regardless of access rights to the Threat Image Projection components would delete or amend any of threat image Projection data or time i.e. Threat Image Projection data on the actual X-ray machine will be read only file.	To be physically checked by the BOO.
17.	X-BIS shall have automated online framing of suspicious material (e.g., Explosives, high density material, narcotics etc.) for operator. This feature should be in real time requiring no operator involvement. "Suspicious material" shall be user defined.	To be physically checked by the BOO.
18.	All the systems should be maintained by the OEMs or entities certified by them.	OEM certificate be obtained.
19.	The system should not be connected or accessed through internet by the OEM for any purpose Including remote diagnosis.	OEM certificate be obtained.
20.	A non-disclosure agreement (NDA) Is to be signed by the Buyer with OEM (Supplier) to affect the confidentiality of the Information pertaining to the system.	OEM certificate be obtained

SL NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
38.	Copy of all software including X-Ray Software with recovery CD must be provided.	X-Ray software with recovery CD be obtained from the Vendor by the BOO.
39.	Operational Training- Operating staff has to be provided free training.	A written agreement be obtained from the Vendor by the BOO.
40.	Operating & service manual shall be provided with each machine in both Hard and Soft modes.	A written agreement be obtained from the Vendor.
41.	Other Features a) Edge & variable edge enhancement. b) Inverse Video c) Set up time not more than 10 minutes d) Pseudo colour e) Date & Time display.	The features mentioned at 40(a), (b), (d) & (e) to be physically checked by the BOO after scanning the baggage through X-Ray machine. The feature 40(c) to be physically checked by the BOO. Time should be noted from plugging the machine through electrical component to bring the machine in operation condition.
42.	Minimum Computer Configuration: - 1. CPU: Should be able to deliver the output to meet the specifications mentioned as above. 2. SSD: 500 GB or Better 3. Mouse: USB Optical 4. Ports: 8 USB Ports (with at least 2 in front), 2 HDMI Port, audio ports for microphone and headphone in front. 5. CD-R/RW Drive: DVD Writer. 6. Networking facility: 10/100/1000 on board integrated Network Port. The system should not be connected or assessed via remote connection by the OEM for any purpose including remote diagnosis.	All features to be checked through technical literature in addition to physical verification.
43.	UPS: 3 KVA or better online with back-up time of % hour to whole system.	To be physically checked by the BOO.
TIPS Feature		
	Threat Image Projection	
1.	Tip software facility shall be incorporated in the offered X-ray machine to assist supervisors in testing the operator alertness and training X-ray screeners to improve their ability in identifying specific threat object. The system will create a threat object and the same will be superimposed on	To be physically checked by the BOO.

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SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
	the monitor screen while a bag is being screened. To acknowledge that the operator has seen the false object, operator must press the control panel key that will cause the computer-generated threat object to disappear from x-rayed bag image on the VDU screen. Each operator's action shall be recorded in the hard disc of the computer for the auditing purpose by the supervisor or other authorized person.	
	DESIGN OF THE SYSTEM:	
2.	Tip software should be compatible with other X-ray technologies such as automatic reject unit. Dual X-Ray screen technologies, automatic treat recognition system etc. All x-ray image functions must be available at the same time along with the TIP.	To be physically checked by the BOO.
	IMAGE LIBRARY	
3.	The image library should have an image library containing at least 100 explosives devices, 100 knives and 100 firearms in various sizes, shapes, locations and orientations. However, the system shall have facility to expand the library to incorporate additional images by user without assistance of the manufacture as and when required.	To be physically checked by the BOO.
4.	The image library should contain images of threats at different orientations both plan and end on orientation should be used. Although these will be assigned different file names and references, it must be possible to cross-reference these as the same threat. All threat image Projection images must be realistic, representative and non-distinguishable from real threat items.	To be physically checked by the BOO.
	TIME INTERVAL	
5.	Programming facility shall be available to project threat images randomly. The time period for threat image as well as image mix in percentage shall be user programmable e.g. software shall select 40% images of explosive devices, 35% of fire arms & 25% knives or random etc.	To be physically checked by the BOO.
6.	Once the screener has responded to Identity of the computer-generated threat Image, It should remain on the screen for a predefined user	To be physically checked by the BOO.

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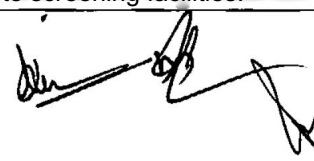
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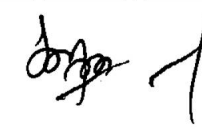
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SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
21.	Service engineers of Indian origin will only be deputed by the OEM or entities authorized by them to maintain the system. Non-Indian engineers may be deputed for major breakdowns under Supervision.	OEM certificate be obtained.
ATRS FEATURES (The X-BIS dual view machine should be integrable with ATRS if required by the user agency. The features of the same should be:-)		
1.	The system must have the ability to be equipped with a RFID reader integrated into the tunnel extension at the entrance of the system.	To be physically checked by BOO.
2.	The system must have the ability to be equipped with sub frames to adapt the conveyor height of the X-BIS dual view machine to conveyor height of the ATRS of 800mm to 940mm.	To be physically checked by BOO.
3.	The system must have the ability to connect an additional Image Evaluation Workstation for increased throughput.	To be physically checked by BOO.
4.	The system must have the ability to connect up to 2 Recheck Workstations for increased alarm resolution.	To be physically checked by BOO.
5.	With integration in ATRS, the system must provide a camera at the entrance to take picture of baggage. The picture to be attached with its corresponding X-Ray image for image evaluation and alarm resolution at recheck.	To be physically checked by BOO.
6.	With integration in ATRS, the systems in feed conveyor must stop automatically in case of a configurable number of unprocessed images in queue.	To be physically checked by BOO.
7.	XBIS Computer Unit shall be provided with an independent UPS of appropriate capacity to support backup time of minimum 30 minutes.	To be physically checked by BOO.
8.	The X-BIS should be mounted on Heavy Duty Castors for ease of movement.	To be physically checked by BOO.
9.	Provision of remote screening facilities.	To be physically cocked by BOO.

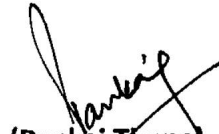
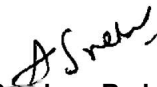







(Mahendra)

Nk/Sub, Assam Rifles


(Pankaj Thapa)
AC, SSB
(Abhijay Patil)
DC/TECH, FHQ, CISF
(Co-opted Member)
(Bikash GKose)
Scientist-G, DRDO
(Co-opted Member)
(Senrayan T)
AC1/NSG
(Nemichand)
DC, ITBP
(Aji.K.K)
SP(MOD), BPR&D
(V.V.S Gautam)
AIG/NZ-AP HQ, CISF
(Member-I)
(Sandeep Reddy)
AC, CRPF
(Anirudh Singh, DC)
IGI Airport, CISF
(Member-II)
Aniljay Singh)
2IC (ADM), BSF
(Praveer Ranjan, IPS)
Special Director General/APS HQ
Chairman of the Board

DRAFT QUALITATIVE REQUIREMENTS OF X-RAY BAGGAGE

INSPECTION SYSTEM CARGO DUAL VIEW

SL NO.	TECHNICAL SPECIFICATION
1.	Each XBIS shall be equipped with two individual independent X-Ray generators with dual View Image.
2.	Tunnel Size- (W x H): (100 to 185 cm) x (100 to 185 cm) and conforming to the purpose for which machine is used.
3.	Conveyor belt speed should be fixed within the range of 0.15 to 0.3 meters per second, as per user requirements. Conveyor movement bidirectional. For cargo machine input and output roller should be motor driven enabling easy handling of the heavy cargo.
4.	All machines should operate on 230 V AC, 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170V to 260 V and frequency fluctuations +/- 5% with stabilizer.
5.	Conveyor Capacity- Conform to the purpose for which the machine is used.
6.	Through put should be 200 bags per hour.
7.	In case of defective diode arrays, scanning should be disabled and error message should be displayed on the screen.
8.	X-Ray Voltage in between 160 to 320 KV as per the purpose for which the machine is used.
9.	Duty Cycle-100%
10.	X-Ray Source/Generator - OEM should provide maintenance and support for a period of 10 years.
11.	The X-ray beam divergence should be such that the complete image at maximum size of bag is displayed without corner cuts.
12.	The radiation level should not exceed accepted health standard (0.1m R/Hr at a distance of 5 CM from external housing). Relevant certificate from AERB
13.	The operating temperature normally should be -5°C to 50°C
14.	Storage temperature: -20°C to 60°C
15.	Humidity- 90% non-condensing
16.	Resolution: The machine should be able to display single un-insulated tinned copper wire of 40-SWG.
17.	Penetration should be 35 mm thickness of steel or more
18.	Continuous Electronic Zoom facility should be available to magnify the chosen area of an image up to sixty-four times (64X). Image features shall be keyboard controllable.
19.	The system should be able to produce clear images on Dual Colour monitors LED Colour monitor minimum 24" size with minimum of 1280 X 1024 pixels.
20.	The machine should have features of Multi-energy X-ray imaging facility where materials of different atomic number will be displayed in different colours to distinguish between organic and inorganic materials. With this method to distinguish high density organic materials including explosives. Machine should have variable colour or materials stripping to facilitate the operator to monitor images of organic materials for closer scrutiny. All suspicious items (Explosives, High density, material narcotics) should be displayed in one mode and that should be on line.
21.	Radiation Safety The machine must comply with requirements of health and safety regulations with regard to mechanical electrical and radiation hazards. Before installation of the machine, the supplier/manufacture should furnish NOC/relevant certificate from Atomic Energy Regulatory Board of India regarding radiation safety after every three years.
22.	The company manufacturing the equipment should have ISO certification for manufacturing and servicing of X-ray Screening machines.

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23.	Film/Food - Safety Guaranteed safety for high-speed films up to ISO1600. The machines should be film/food safe. In other words, photographic films and food must not be damaged due to X-Ray examination.
24.	Machine should be properly sealed from all the sides for pest proof. Anti-rodent and Dust proof cover is to be provided for covering when system is not in use.
25.	Facility for variable contrast must be incorporated to allow enhancement of lighter and darker portion of the image.
26.	The machine should be so designed that software enhancement can be easily implemented to take care of new technique in image processing and pattern recognition.
27.	All models should have software-controlled diagnosis report facility and should include following information I. XBIS Make/Model/Sr. No. II. Software/ Firmware/Algorithm Version Number III. Status/Values of major Power Supply Voltages IV. Generator Voltage (X-Ray ON/X-Ray OFF) V. Generator Anode Current (X-Ray ON/X-Ray OFF) VI. Generator Heater Current (X-Ray ON/X-Ray OFF) VII. Diode Array (Raw/Calibrated) Response (X-Ray ON/X-Ray OFF) VIII. Grand total number of Bags scanned IX. XBIS fault Log X. XBIS Photoelectric Light Barrier (Tunnel Entry/Exit) Status XI. Emergency switches status
28.	All software features of machine should be activated and password protected.
29.	Machine should be capable for recalling 100 or more previous images. Depending upon the user requirement, rejected bag image shall be transmitted to an additional monitor erected at the physical check point to facilitate the screener and also increase through put.
30.	It should have the capability of archiving up to 2,00,000 images with date & time stamp. The quality of the images should remain intact when retrieved and viewed on any external device.
31.	Control desk with security housing and locking provision should be available. The operator personal identification number can be entered through keyboard along with generation of log.
32.	Facility of image enhancement should be available.
33.	All models should have online recording facility and images can be recorded in USB/Electronic storage devices. The recording should be retained for minimum 30 days.
34.	Lead impregnated safety screens should be available at either ends of the tunnel. This should be covered by relevant AERB certificate. Idle rollers to be provided at either ends of the tunnel to facilitate placing of baggage at input and output points.
35.	System should work on one software only. All software features should be controlled from key board/ mouse/ touch screen of machine only. Control functions should be user friendly. To enable / disable the software features, system should not be TeboDt'd. Control Software (Algorithms, TIP Library etc.) should be cybersecure and should be VAPT certified by a CERT-IN empanelled lab.
36.	If the machine fails to penetrate a particular item then an alarm (video and audio both) should be generated to notify the operator.
37.	The threat image projection (TIP) system software to be incorporated in all X-BIS operation.
38.	Copy of all software including X-Ray Software with recovery CD must be provided.
39.	Operational Training- Operating staff has to be provided free training.
40.	Operating & service manual shall be provided with each machine in both Hard and Soft modes.

41.	Other Features - Edge & variable edge enhancement. - Inverse Video - Set up time not more than 10 minutes - Pseudo colour - Date & Time display.
42.	Minimum Computer Configuration: - - CPU: Should be able to deliver the output to meet the specifications mentioned as above. - SSD: 500 GB or Better - Mouse: USB Optical - Ports: 8 USB Ports (with at least 2 in front), 2 HDMI Port, audio ports for microphone and headphone in front. - CD-R/RW Drive: DVD Writer. - Networking facility: 10/100/1000 on board integrated Network Port. The system should not be connected or assessed via remote connection by the OEM for any purpose including remote diagnosis
43.	UPS: 3 KVA or better online with back-up time of 'A hour to whole system.
TIPS Feature	
Threat Image Projection	
1.	Tip software facility shall be incorporated in the offered X-ray machine to assist supervisors in testing the operator alertness and training X-ray screeners to improve their ability in identifying specific threat object. The system will create a threat object and the same will be superimposed on the monitor screen while a bag is being screened. To acknowledge that the operator has seen the false object, operator must press the control panel key that will cause the computer-generated threat object to disappear from x-rayed bag image on the VDU screen. Each operator's action shall be recorded in the hard disc of the computer for the auditing purpose by the supervisor or other authorized person.
DESIGN OF THE SYSTEM:	
2.	Tip software should be compatible with other X-ray technologies such as automatic reject unit. Dual X-Ray screen technologies, automatic treat recognition system etc. All x-ray image functions must be available at the same time along with the TIP.
IMAGE LIBRARY	
3.	The image library should have an image library containing at least 100 explosives devices, 100 knives and 100 firearms in various sizes, shapes, locations and orientations. However, the system shall have facility to expand the library to incorporate additional images by user without assistance of the manufacture as and when required.
Technical Specifications	
4.	The image library should contain images of threats at different orientations both plan and end on orientation should be used. Although these will be assigned different file names and references, it must be possible to cross-reference these as the same threat. All threat image Projection images must be realistic, representative and non-distinguishable from real threat items.
TIME INTERVAL	
5.	Programming facility shall be available to project threat images randomly. The time period for threat image as well as image mix in percentage shall be user programmable e.g. software shall select 40% images of explosive devices, 35% of fire arms & 25% knives or random etc.

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6.	Once the screener has responded to identity of the computer-generated threat image, it should remain on the screen for a predefined user programmable time for analysis. ; The image should be highlighted, upon identification, and feedback message shall be visible to the screener.
	SYSTEM ADMINISTRATION
7.	The threat image projection facility shall have details of user data-base such as Department name, screener name, Organization, User ID Number, level of access such as screener, administrator, Maintenance & Password etc.
8.	Access to start up menu should be restricted only to the authorized individuals. A log-in procedure by means of Password" or "Security Key" could achieve restricted access to each of the comment. The log-in procedure should not take longer than 20 seconds. The system should have facility to bypass the TIP facility, if programmed so by the system administrator. It is to be ensured that the TIP software shall not be hindrance to normal functioning of x-ray machines.
9.	When the operator logs-in or logs-out message should be displayed on x-ray BIS VDU i Screen to confirm that the/she has been correctly logged-in or logged-out.
	FEED BACK REPORT
10.	The threat image Projection should be capable of giving feedback "HIT, MISS or FALSE ALARM" message. No message will be presented if a screener correctly passed as clear bag.
11.	A "HIT" message to be presented when a screener has correctly identified a Threat ¹ image Projection Image. A "MISS" message shall be presented when screener fails to identify the TIP image. A "False Alarm" message shall be given when screener i incorrectly indicate TIP image when in fact no threat image projection is present. The i feedback should clearly indicate in a screen that a tip object has been correctly identified/tip object has been missed/ that a TIP object has been missed/no TIP object j was present. Information should be recorded in the database.
12.	Different colour coding shall be used for feedback to the Screener. It is recommended that colour code "Red for MISS" Green for" HIT" and Yellow to False Alarm or interrupt" be used.
13.	The system shall automatically prepare the daily log of events for each shift and for 1 each Screener performance. TIP log shall include particulars of Name of Screener, Time & date of threat image, weather threat image was successfully identified or missed etc.
14.	The report on Threat Image Projection system may have date and time (From - to) as per requirement. Screener particulars, and decision/outcome i.e., MISS, HIT or False Alarm in percentage as well in absolute numbers, numbers of bags screened, categories 1 such as explosives devices knife or weapon etc.
15.	As a standard practice, daily/weekly /monthly report shall be retrieved. Report shall be for any given time and period, as per command.
16.	All data should be stored on the system for a minimum of two months after it has been j down loaded. No individual, regardless of access rights to the Threat Image Projection t components would delete or amend any of threat image Projection data or time i.e., ; Threat Image Projection data on the actual X-ray machine will be read only file
17.	X-BIS shall have automated online framing of suspicious material (e.g.. Explosives, high density material, narcotics etc.) for operator. This feature should be in real time i requiring no operator involvement. "Suspicious material" shall be user defined.
18.	All the systems should be maintained by the OEMs or entities certified by them.
19.	The system should not be connected or accessed through internet by the OEM for pny j purpose including remote diagnosis.

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20.	A non-disclosure agreement (NDA) is to be signed by the Buyer with OEM (Supplier) to affect the confidentiality of the information pertaining to the system.
21.	Service engineers of Indian origin will only be deputed by the OEM or entities authorized by them to maintain the system. Non-Indian engineers may be deputed for major breakdowns under Supervision.



(Mahendra)

Nk/Sub, Assam Rifles



(Senrayan T)

AC1/NSG



(Sandeep Reddy)

AC, CRPF



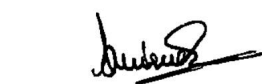
(Pankaj Xhapa)

AC, SSB



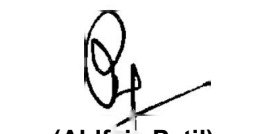
(Nemichand)

DC, ITBP



(Anirudh Singh, DC)

1GI Airport, CISF
(Member-II)



(Abhifajy Patil)

DC/TECH, FHQ, CISF
(Co-opted Member)



(Aji.K.S)

SP(MOD), BPR&D



(Sanjay Singh)

2IC (ADM), BSF



(Bikash Ghose)

Scientist-G, DRDO
(Co-opted Member)



(V.V.S Gautam)

AIG/NZ-AP HQ, CISF
(Member-I)

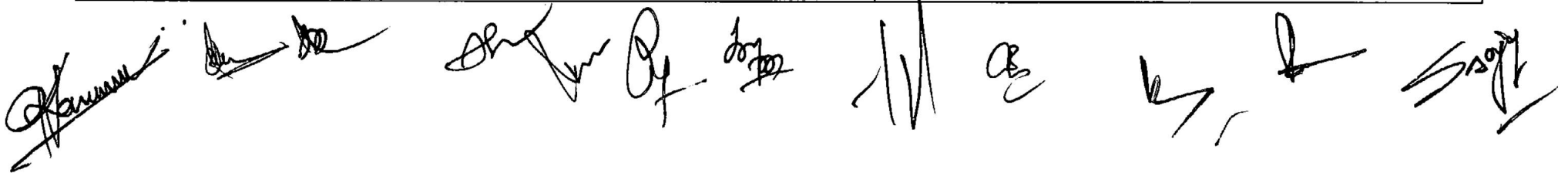


(Praveer Rinjan, IPS)

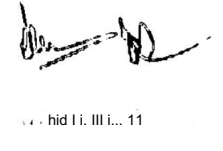
Special Director General/APS HQ
Chairman of the Board

DRAFT TRIAL DIRECTIVES OF X-RAY BAGGAGE INSPECTION SYSTEM CARGO DUAL VIEW

SL NO.	Proposed QRs Specification	Procedure Suggested for Trail fdr BOO
1.	Each XBIS shall be equipped with two individual independent X-Ray generators with dual View Image.	To be checked by the BOO.
2.	Tunnel Size- (W x H): (100 to 185 cm) x (100 to 185 cm) and conforming to the purpose for which machine is used.	To be physically checked by the BOO through measuring instrument.
3.	Conveyor belt speed should be fixed within the range of 0.15 to 0.3 meters per second, as per user requirements. Conveyor movement bidirectional. For cargo machine input and output roller should be motor driven enabling easy handling of the heavy cargo.	To be physically checked by the BOO through Tachometer.
4.	All machines should operate on 230 V AC, 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170V to 260 V and frequency fluctuations +/- 5% with stabilizer.	Plug the machine through electrical component and check the operation of the machine within the specified range of power supply. To be physically checked.
5.	Conveyor Capacity- Conform to the purpose for which the machine is used.	To be physically checked.
6.	Through put should be 200 bags per hour.	To be physically checked.
7.	In case of defective diode arrays, scanning should be disabled and error message should be displayed on the screen.	To be physically checked.
8.	X-Ray Voltage in between 160 to 320 KV as per the purpose for which the machine is used.	Plug the machine through electrical component and verify the X-Ray voltage on the screen of VDU.
9.	Duty Cycle-100%	An OEM certificate be obtained from the Vendor.
10.	X-Ray Source/Generator - OEM should provide support and maintenance for a period of 10 years.	An OEM certificate be obtained from the Vendor.
11.	The X-ray beam divergence should be such that the complete image at maximum size of bag is displayed without corner cuts.	Place the baggage in the tunnel of machine and see the image on VDU.
12.	The radiation level should not exceed accepted health standard (0.1m R/Hr at a distance of 5 CM from external housing). Relevant certificate from AERB	An AERB certificate should be obtained from the Vendors.



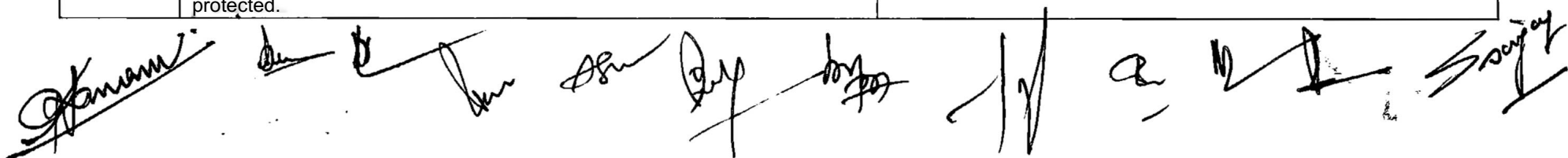
SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
13.	The operating temperature normally should be -5°C to 50°C	A certificate from a NABL accredited or any internationally accredited organization be obtained from the Vendor.
14.	Storage temperature: -20°C to 60°C	A certificate from a NABL accredited or any internationally accredited organization be obtained from the Vendor.
15.	Humidity- 90% non-condensing	A certificate from a NABL accredited or any internationally accredited organization be obtained from the Vendor.
16.	Resolution: The machine should be able to display single un-insulated tinned copper wire of 40-SWG.	Scan the CTP in operational condition of machine without operating any functional key, thereafter 40 SWG wire should be seen on the VDU.
17.	Penetration should be 35 mm thickness of steel or more	Scan the CTP in operational condition of machine and see the image of 35 mm thickness of steel on VDU.
18.	Continuous Electronic Zoom facility should be available to magnify the chosen area of an image up to sixty-four times (64X). Image features shall be keyboard controllable.	To be physically checked.
19.	The system should be able to produce clear images on Dual Colour monitors LED Colour monitor minimum 24" size with minimum of 1280 X 1024 pixels.	To be physically checked and an OEM certificate be obtained from the vendor.
20.	The machine should have features of Multi-energy X-ray imaging facility where materials of different atomic number will be displayed in different colours to distinguish between organic and inorganic materials. With this method to distinguish high density organic materials including explosives. Machine should have variable colour or materials stripping to facilitate the operator to monitor images of organic materials for closer scrutiny. All suspicious items (Explosives, High density, material narcotics) should be displayed in one mode and that should be on line.	Scan the CTP and checked the multi energy X-ray imaging facility through the multi energy test (i.e. sugar & salt) to distinguish inorganic & organic materials with the colours on the VDU.
21.	Radiation Safety The machine must comply with requirements of health and safety regulations with regard to mechanical electrical and radiation hazards. Before Installation of the machine, the supplier/manufacturer should furnish NOC/relevant certificate from Atomic Energy Regulatory Board of India regarding radiation safety after every three years.	AERB certificate be obtained from the Vendors.



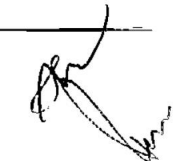
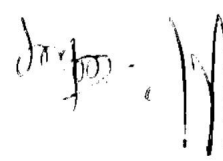



SL NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
22.	The company manufacturing the equipment should have ISO certification for manufacturing and servicing of X-ray Screening machines.	ISO certificate be obtained from the Vendors.
23.	Film/Food - Safety Guaranteed safety for high-speed films up to ISO1600. The machines should be film/food safe. In other words, photographic films and food must not be damaged due to X-Ray examination.	An OEM certificate be obtained from the Vendor.
24.	Machine should be properly sealed from all the sides for pest proof. Anti-rodent and Dust proof cover is to be provided for covering when system is not in use.	To be physically checked by BOO.
25.	Facility for variable contrast must be incorporated to allow enhancement of lighter and darker portion of the image.	Scan the baggage through X-Ray machine and operate the variable contrast key for checking of enhancement of darker portion of the image. To be physically checked by the BOO.
26.	The machine should be so designed that software enhancement can be easily implemented to take care of new technique in image processing and pattern recognition.	OEM certificate be obtained.
27.	All models should have software-controlled diagnosis report facility and should include following information I. XBIS Make/ Model/ Sr. No. II. Software/ Firmware/Algorithm Version Number III. Status/Values of major Power Supply Voltages IV. Generator Voltage (X-Ray ON/X-Ray OFF) V. Generator Anode Current (X-Ray ON/X-Ray OFF) VI. Generator Heater Current (X-Ray ON/X-Ray OFF) VII. Diode Array (Raw/Calibrated) Response (X-Ray ON/X-Ray OFF) VIII. Grand total number of Bags scanned IX. XBIS fault Log X. XBIS Photoelectric Light Barrier (Tunnel Entry/Exit) Status XI. Emergency switches status	To be physically checked by the BOO.
28.	All software features of machine should be activated and password protected.	To be physically checked by the BOO.



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29.	Machine should be capable for recalling 100 or more previous images. Depending upon the user requirement, rejected bag image shall be transmitted to an additional monitor erected at the physical check point to facilitate the screener and also increase through put.	To be physically checked by the BOO.
30.	It should have the capability of archiving up to 2,00,000 images with date & time stamp. The quality of the images should remain intact when retrieved and viewed on any external device	To be physically checked by the BOO.
31.	Control desk with security housing and locking provision should be available. The operator personal identification number can be entered through keyboard along with generation of log.	To be physically checked by the BOO.
32.	Facility of image enhancement should be available.	Scan the baggage through X-Ray machine and operate the image enhancement key available on the keyboard.
33.	All models should have online recording facility and images can be recorded in USB/Electronic storage devices. The recording should be retained for minimum 30 days.	To be physically checked by the BOO.
34.	Lead impregnated safety screens should be available at either ends of the tunnel. This should be covered by relevant AERB certificate. Idle rollers to be provided at either ends of the tunnel to facilitate placing of baggage at input and output points.	AERB certificate be obtained from the Vendors.
35.	System should work on one software only. All software features should be controlled from key board/ mouse/ touch screen of machine only. Control functions should be user friendly. To enable / disable the software features, system should not be rebooted. Control Software (Algorithms, TIP Library etc.) should be cybersecure and should be VAPT certified by a CERT-IN empanelled lab.	To be physically checked by the BOO.
36.	If the machine fails to penetrate a particular item then an alarm (video and audio both) should be generated to notify the operator.	To be physically checked by the BOO.
37.	The threat Image projection (TIP) system software to be Incorporated In all X-BIS operation.	To be physically checked by the BOO.
3B.	Copy of all software Including X-Ray Software with recovery Cb must be provided.	X-Ray software with recovery CD be obtained from the Vendor by the BOO.



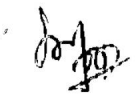


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39.	Operational Training- Operating staff has to be provided free training.	A written agreement be obtained from the Vendor by the BOO.
40.	Operating & service manual shall be provided with each machine in both Hard and Soft modes.	A written agreement be obtained from the Vendor.
41.	Other Features a) Edge & variable edge enhancement. b) Inverse Video c) Set up time not more that 10 minutes d) Pseudo colour e) Date & Time display.	The features mentioned at 40(a), (b), (d) & (e) to be physically checked by the BOO after scanning the baggage through X-Ray machine. The feature 40(c) to be physically checked by the BOO. Time should be noted from plugging the machine through electrical component to bring the machine in operation condition.
42.	Minimum Computer Configuration: - 1. CPU: Should be able to deliver the output to meet the specifications mentioned as above. 2. SSD: 500 GB or Better 3. Mouse: USB Optical 4. Ports: 8 USB Ports (with at least 2 in front), 2 HDMI Port, audio ports for microphone and headphone in front. 5. CD-R/RW Drive: DVD Writer. 6. Networking facility: 10/100/1000 on board integrated Network Port. The system should not be connected or assessed via remote connection by the OEM for any purpose including remote diagnosis	All features to be checked through technical literature in addition to physical verification.
43.	UPS: 3 KVA or better online with back-up time of % hour to whole system.	To be physically checked by the BOO.
TIPS Feature		
	Threat Image Projection	
1.	Tip software facility shall be incorporated in the offered X-ray machine to assist supervisors in testing the operator alertness and training X-ray screeners to improve their ability in identifying specific threat object. The system will create a threat object and the same will be superimposed on the monitor screen while a bag is being screened. To acknowledge that the operator has seen the false object, operator must press the control	To be physically checked by the BOO.

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SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
	panel key that will cause the computer-generated threat object to disappear from x-rayed bag image on the VDU screen. Each operator's action shall be recorded in the hard disc of the computer for the auditing purpose by the supervisor or other authorized person.	
	DESIGN OF THE SYSTEM:	
2.	Tip software should be compatible with other X-ray technologies such as automatic reject unit. Dual X-Ray screen technologies, automatic treat recognition system etc. All x-ray image functions must be available at the same time along with the TIP.	To be physically checked by the BOO.
	IMAGE LIBRARY	
3.	The image library should have an image library containing at least 100 explosives devices, 100 knives and 100 firearms in various sizes, shapes, locations and orientations. However, the system shall have facility to expand the library to incorporate additional images by user without assistance of the manufacture as and when required.	To be physically checked by the BOO.
4.	The image library should contain images of threats at different orientations both plan and end on orientation should be used. Although these will be assigned different file names and references, it must be possible to cross-reference these as the same threat. All threat image Projection images must be realistic, representative and non-distinguishable from real threat items.	To be physically checked by the BOO.
	TIME INTERVAL	
5.	Programming facility shall be available to project threat images randomly. The time period for threat image as well as image mix in percentage shall be user programmable e.g. software shall select 40% Images of explosive devices, 35% of fire arms & 25% knives or random etc.	To be physically checked by the BOO.
6.	Once the screener has responded to Identity of the computer-generated threat Image, it should remain on the screen for a predefined user	To be physically checked by the BOO.



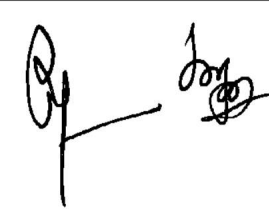





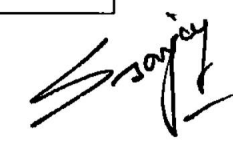



SL. NO.	Proposed QRs Specification	Procedure Suggested for Trail for BOO
	programmable time for analysis. The image should be highlighted, upon identification, and feedback message shall be visible to the screener.	
	SYSTEM ADMINISTRATION	
7.	The threat image projection facility shall have details of user data-base such as Department name, screener name, Organization, User ID Number, level of access such as screener, administrator, Maintenance & Password etc.	To be physically checked by the BOO.
8.	Access to start up menu should be restricted only to the authorized individuals. A log-in procedure by means of Password" or "Security Key" could achieve restricted access to each of the comment. The log-in procedure should not take longer than 20 seconds. The system should have facility to bypass the TIP facility, if programmed so by the system administrator. It is to be ensured that the TIP software shall not be hindrance to normal functioning of x-ray machines.	To be physically checked by the BOO.
9.	When the operator logs-in or logs-out message should be displayed on x-ray BIS VDU Screen to confirm that the/she has been correctly logged-in or logged-out.	To be physically checked by the BOO.
	FEED BACK REPORT	
10.	The threat image Projection should be capable of giving feedback "HIT, MISS or FALSE ALARM" message. No message will be presented if a screener correctly passed as clear bag.	To be physically checked by the BOO.
11.	A "HIT" message to be presented when a screener has correctly identified a Threat image Projection Image. A "MISS" message shall be presented when screener fails to identify the TIP image. A "False Alarm" message shall be given when screener incorrectly indicate TIP image when in fact no threat image projection is present. The feedback should clearly indicate in a screen that a tip object has been correctly identified/tip object has been missed/ that a TIP object has been missed/no TIP object was present. Information should be recorded in the database.	To be physically checked by the BOO.







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12.	Different colour coding shall be used for feedback to the Screener. It is recommended that colour code "Red for MISS" Green for " HIT" and Yellow to False Alarm or interrupt" be used.	To be physically checked by the BOO.
13.	The system shall automatically prepare the daily log of events for each shift and for each Screener performance. TIP log shall include particulars of Name of Screener, Time & date of threat image, weather threat image was successfully identified or missed etc.	To be physically checked by the BOO.
14.	The report on Threat Image Projection system may have date and time (From - to) as per requirement. Screener particulars, and decision/outcome i.e. MISS, HIT or False Alarm in percentage as well in absolute numbers, numbers of bags screened, categories such as explosives devices knife or weapon etc.	To be physically checked by the BOO.
15.	As a standard practice, daily/weekly /monthly report shall be retrieved. Report shall be for any given time and period, as per command.	To be physically checked by the BOO.
16.	All data should be stored on the system for a minimum of two months after it has been down loaded. No individual, regardless of access rights to the Threat Image Projection components would delete or amend any of threat image Projection data or time i.e. Threat Image Projection data on the actual X-ray machine will be read only file.	To be physically checked by the BOO.
17.	X-BIS shall have automated online framing of suspicious material (e.g., Explosives, high density material, narcotics etc.) for operator. This feature should be in real time requiring no operator involvement. "Suspicious material" shall be user defined.	To be physically checked by the BOO.
18.	All the systems should be maintained by the OEMs or entities certified by them.	OEM certificate be obtained.
19.	The system should not be connected or accessed through internet by the OEM for any purpose including remote diagnosis.	OEM certificate be obtained.
20.	A non-disclosure agreement (NDA) is to be signed by the Buyer with OEM (Supplier) to affect the confidentiality of the Information pertaining to the system.	OEM certificate be obtained.

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21.	Service engineers of Indian origin will only be deputed by the OEM or entities authorized by them to maintain the system. Non-Indian engineers may be deputed for major breakdowns under Supervision.	OEM certificate be obtained.


(Mahendra)
Nk/Sub, Assam Rifles

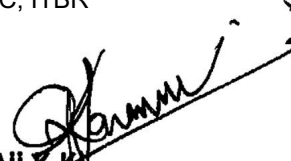

(Panka) Thapa)
AC, SSB


(Abhay Patil)
DC/TECH, FHQ, CISF
(Co-opted Member)

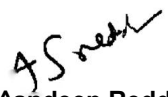
6U
(Bikash Ghose)
Scientist-G, DRDO
(Co-opted Member)


(Senrayan T)
AC1/NSG


(Nemichand)
DC, ITBR


(Aji.R.K)
SP(MOD), BPR&D


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