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Technical Demo Acceptance Test Procedure

Bidder (Nai	ne &	Address)):
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Date: ____/__/2019

S. No.	Requirement	Acceptance Test Procedure	Results/Remarks
1.	Physical verification		
1.1	XBIS	Verify as per information from Marking Plate & Software	Make:
			Model
			Sr. No.
1.2	XBIS Display Monitor	Verify as per information from Marking Plate	Make:
			Model
1.3	СТР	Verify CTP Certification	Make:

Signature & Seal of Bidder Firm	
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	Requirement	Acceptance Test Procedure	Results/Remarks
2.	SPECIFICATIONS OF XBIS		
2.1	The company manufacturing the equipment should have ISO certification for manufacturing and servicing of X-Ray screening machines.	ISO certification for manufacturing and servicing, shall be provided by the Bidder, and verified by the Inspector.	Pass: □/Fail: □
2.2	SAFETY: The offered machines must comply with requirements of Health and Safety Regulations with regard to mechanical, electrical and radiation hazards as given in tender	National/International Government accredited laboratory test certificates with regard to mechanical, electrical and radiation safety of the offered XBIS and accessories will be provided by the Bidder, and verified by the Inspector.	Pass: □/Fail: □
2.3	The supplier/manufacturer should furnish NOC from Atomic Energy Regulatory Board of India regarding Radiation safety as given in tender	Atomic Energy Regulatory Board (AERB)	Pass: □/Fail: □
2.4	The machine should be Film-safe . In other words photographic films must not be damaged due to X-Ray examination.	Inspector shall check certification provided by the Bidder. (Copies to be enclosed with this report).	Pass: □/Fail: □

2.5	Tunnel Size (W X H):	620 (+/- 5%) mm (width) x 420 (+/- 5%) mm (height).	To be practically demonstrated by the Bidder and shall be verified by the Inspector using measuring scale/tape, etc.	Width:	_ mm _ mm
2.6	Conveyor Height	675 mm – 800 mm (+/-2%)from Floor Level to Belt Top Surface.	To be practically demonstrated by the Bidder and shall be verified by the Inspector using measuring scale/tape, etc.	Height:	mm
2.7	Input roller length	Input Roller length: 1.0 m atleast	To be practically demonstrated by the Bidder and shall be verified by the Inspector using measuring scale/tape, etc.	Length:	meters
2.8	Output roller length	Output Roller length: 1 m atleast	To be practically demonstrated by the Bidder and shall be verified by the Inspector using measuring scale/tape, etc.	Length:	meters

2.9	Anti-rodent and dust-proof cover must be provided with each XBIS.	To be physically demonstrated by the Bidder and shall be verified by the Inspector	Pass: □/Fail: □
2.10	Lead impregnated safety screens should be available at either end of the tunnel.	To be physically demonstrated by the Bidder and shall be verified by the Inspector	Pass: □/Fail: □
2.11	Control Console should be provided for housing both Monitors and Keyboard. Table and Desktop cover for Operator Console to be provided.	The features as per the tender requirements shall be demonstrated by the Bidder, and verified by the Inspector.	Pass: □/Fail: □
2.12	Hardware/Software Version	To be practically demonstrated by the Bidder, by switching on the XBIS and System SW Version and Operating System & its Version shall be noted by the inspector	OS/Version: System SW Version:
2.13	Conveyor belt speed should be between 0.18 and 0.3 metres/ second in either (forward/reverse) directions for x-ray baggage inspection system		Speed:metres/second
2.14	Bidder shall provide following information in respect of the X-ray generator provided with offered XBIS.	To be practically demonstrated by the Bidder using measuring instrument/diagnostic program, and shall be verified by the Inspector. Parameters shall be verified with the limits specified in the AERB Rad ation Safety NOC.	

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	Parameter	GENERATOR		
	i. Rated Voltage	kV		all and the second second
	ii. Operating Voltage	kV		
	iii. Anode Current	mA		
2.15	CALIBRATION BODY: Some XBIS require regular calibration of software/hardware using calibration body sets. If such is the case, a calibration body set will be supplied with each XBIS.	out XBIS Calibration using sets, and shall be veri	ng the offered calibration body fied by the Inspector. (Scan	Calibration body: Available: □/Not available: □
2.16	Bag orientation: lying flat or standing up	To be practically demonstrated by the Bidder, by passing test object in lying flat and standing up orientations in forward and reverse directions, and scanned images shall be verified by the Inspector. (Scan images/screenshots to be preserved)		Pass: □/Fail: □
	The following CTP Tests shall be carried out as per the Methods and Results shall be analysed as described below			

he system should be able to produce clear nages on colour monitors with minimum of 22" ED Full HD colour monitors of 1280 X 1024 ixels. Machine should be capable of recalling ninimum 50 previous images.	The diagonal screen size of display monitor shall be physically checked an verified with OEM Marual The image resolution and monitor resolution shall be demonstrated by the Bidder and checked by the Inspector To be practically demonstrated by the Bidder and verified by the Inspector	Pass: □/Fail: □
ninimum 50 previous images. should have the capability of archiving	verified by the Inspector	Pass: □/Fail: □
,50,000 images.	XBIS shall have facility to store all scanned object images, if required. To be practically demonstrated by the Bidder and verified by the Inspector	Average image size on disk: Total Image Storage Disk Partition Size:
hroughput shall be minimum 300 bags per our for XBIS machines.	To be practically checked and verified with XBIS under test for at least one hour via suitable instrument.	Throughput: Bags per hour
Ill software features should be controlled rom Key-board of machine only. Keyboard function should be user friendly. To enable/disable the software features, system hould not be rebooted.	All Keyboard Functions to be practically demonstrated by the Bidder and results shall be verified by the Inspector	Pass: □/Fail: □
acility of Image Enhancement should be available.	Scan the baggage through XBIS and check the image enhancement key function available on the XBIS Control Keyboard. Recall a previously stored bag image and check the	Image Enhancement Functions: NEGATIVE : BLACK/WHITE : Edge Enhancement : Organic Only :
n h	om Key-board of machine only. Eyboard function should be user friendly. To able/disable the software features, system ould not be rebooted. Icility of Image Enhancement should be	All Keyboard Functions to be practically demonstrated by the Bidder and results shall be verified by the Inspector All Keyboard Functions to be practically demonstrated by the Bidder and results shall be verified by the Inspector Scan the baggage through XBIS and check the image enhancement key function available on the XBIS Control

		Control Keyboard.	Organic Striping : □ Variable Contrast : □: □ Image Enhancement : □ Other Enhancement functions: □ □ □ □ □ □ □ □ □
2.24	All the supplied XBIS machines should have real time image processing including image enhancement functions without interference.	To be demonstrated by the Bidder and shall be verified by the Inspector.	Pass: □/Fail: □
	Zoom facility should be available to magnify the chosen area of an image four times (X64) or more. Image feature shall be keyboard controllable.	To be practically demonstrated by the Bidder and shall be verified by the Inspector	Pass: □/Fail: □
	XBIS should have automated, on-line framing of suspicious materials (e.g. explosives, etc.). This function should be in real time requiring no operator involvement.	To be demonstrated by the Bidder with certified Explosive simulant/sample, and shall be verified by the Inspector. (Scan images/screenshots to be preserved)	Pass: □/Fail: □
	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 practically demonstrated by the Bidder with High Density Sample, and shall be verified by the Inspector. (Scan images/screenshots to be preserved)	Pass: □/Fail: □
2.28	The system shall have X-Ray screening technology combined with advanced detection algorithms to analyse automatically each passing on baggage for the presence of explosives.	(circle/ frame) of threat material, high density material, explosive on operator display monitor.	Pass: u/Fail: u

	The system shall have computer image processing, so that even suspect materials hidden or masked by any other object shall be identified and highlighted on the monitor screen for the operator.	To be demonstrated by the Bidder by suspect material masking with diffeent materials like books, clothes, Aluminium/Steel Plate and shall be verified by the Inspector. (Scan images/screenshots to be preserved)	Pass: □/Fail: □
	The screening (X-ray) system shall be an efficient and effective system, based on latest and proven technology, and shall be ideally suitable for the use at passenger terminals for 100% baggage screening without affecting the flow of passengers and shall have excellent performance data. The system shall permit rapid and reliable X-ray examination of extremely opaque objects and at the same time show details of very small thin wires in the screen also.	To be demonstrated by the Bidder and shall be verified by the Inspector.	Pass: □/Fail: □
2.31	The X-ray beam divergence should be such that the complete image of maximum size of bag is displayed without corner cuts .	To be practically demonstrated by the Bidder, by passing test object of maximum size, in forward and reverse directions, and shall be verified by the Inspector. The complete image at maximum size of test object should be displayed on XBIS Monitor without corner cuts. (Scan images/screenshots to be preserved)	Test object size: H: mm L: mm
2.32	The radiation level should not exceed accepted health standards (0.1 mR/Hr) at a distance of 5 cm. from external housing.	Valid Certificate of Radiation Safety issued by Atomic Energy Regulatory Board (AERB), Govt of India, shall be provided by the Bidder and it shall be verified by the Inspector. To be practically demonstrated by the Bidder, with continuous X-ray scanning of baggage on running XBIS belt, and shall be verified by the Inspector, using calibrated Radiation _evel Meter at:	W: mm Radiation Level: i. mR/Hr.

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3.	COMBINED TEST PIECE (CTP)		
3.1.	The manufacturer shall provide one set of CTP per machine for checking serviceability of the machine by the operator.	(Maha-Metro provided CTP shall be used for the CTP Tests.)	Pass: □/Fail: □
3.2.	The Combined Test Piece should be supplied as specified in the tender document and should be approved by Government accredited Test Laboratory/Organization. Test report in respect of material composition and object dimensions of CTP, from Government accredited Test Laboratory/Organization shall be submitted along with the Technical Bid.	Inspector shall check certification proviced by the Bidder. (Copies to be enclosed with this report).	Make: Model Sr. No.: Test Report: □ Test Laboratory/Organization: Pass: □/Fail: □
3.3.	The details of CTP are given below:		
3.3.	COMBINED TEST PIECE REQUIREMENTS		
a)	SINGLE WIRE RESOLUTION (TEST No.1) The requirement is to display 40 SWG wire not covered by step-wedge. A tick will indicate the visibility of appropriate wire. A set of uninsulated tinned copper wire of size 26, 30, 35, 38, 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	CTP to be demonstrated by the bidder and shall be verified by the Inspector, for compliance to the tender requirements.	Pass: □/Fail: □

		i. Baggage Entry Side	ii mR/Hr.
		ii. Baggage Exit Side	iii mR/Hr.
		iii. Side Panel (Generator Side)	iv mR/Hr.
	Conveyor load capacity (distributed) 160 KG or more	passing test object of 160 Kgs in forward and reverse directions through nput Roller, XBIS Belt and Output Roller/Drop Chute and shall be verified by the Inspector.	Pass: □/Fail: □
	The Threat Image Projection (TIP) System software to be incorporated in all XBIS operation as per details given in tender	To be practically demonstrated by the Bidder and shall be verified by the Inspector	Pass: □/Fail: □
	All software features of machine should be online and password protected.	To be practically demonstrated by the Bidder and shall be verified by the Inspector	Pass: □/Fail: □
2.36	All models should have online recording facility and images can be recorded in USB Disk/Optical Drive		Pass: □/Fail: □
	All models should have software controlled diagnosis report facility and system should give printout if printer is connected.	be verified by the Inspector. (Diagnostic report print copy to be preserved).	Pass: □/Fail: □
2.38	implemented to take care of new technique in image processing and pattern recognition.	To be checked during the Technical Bid Document Scrutiny	
2.39	One operator manual shall be provided with each machine.		Pass: □/Fail: □

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	visible		
0)	USEFUL PENETRATION (TEST No.2) The test defines what level of details can be seen behind a thickness of known material. The CTP 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 (5/16"). Tick on log sheet will indicate what wires are visible.	CTP to be demonstrated by the bidder and shall be verified by the Inspector, for compliance to the tender requirements.	Pass: □/Fail: □
c)	MATERIAL DISCRIMINATION (TEST No. 3) The requirement is that different colours be allocated to the sample of organic and inorganic substances.	CTP to be demonstrated by the bidder and shall be verified by the Inspector, for compliance to the tender requirements.	Pass: □/Fail: □
	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 CTP will check the material discrimination facility. A tick will indicate that the sugar/salt samples are shown in different colour.		
() ()	SIMPLE PENETRATION (TEST No. 4) The requirement is that the lead be visible beneath 35 mm of Steel. This test defines what thickness of steel the machine should be able to penetrate. The steel step wedge on the CTP has steps of 2 mm from 16 mm to 35 mm with a lead strip to check that the machine is above or below the requirement. A tick in log sheet will indicate where a lead strip is visible.	CTP to be demonstrated by the bidder and shall be verified by the Inspector, for compliance to the tender requirements.	Pass: □/Fail: □

e)	SPATIAL RESOLUTION (TEST No. 5)	CTP to be demonstrated by the bidder and shall be verified by the Inspector, for compliance to the tender	Pass: □/Fail: □
	The requirement is that a vertical and horizontal grating to be seen.	requirements.	
	This test defines the ability of the system to		
÷	distinguish and display objects which are close		
	together. The CTP has 16 copper gratings at		
	right angle to each other. A tick in the log sheet		
	will indicate that gaps in the gratings are visible.		
f)	THIN METAL IMAGING (TEST No. 6)	CTP to be demonstrated by the bidder and shall be	Pass: □/Fail: □
		verified by the Inspector, for compliance to the tender	
	The requirement is to image steel 0.1 mm	requirements.	
	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.		
g)	METHOD:		
	a. The CTP should be certified by a		
	Government Test lab for dimensions and		
	material compositions. The CTP is to be		
	used as a quick routine test carried out daily to ensure that equipment is working properly		
	and satisfactory image is obtained. The		
	results of the tests should be recorded.		
	b. The CTP should be placed on the belt and		
	passed through the belt at least once in a		
	day before the baggage is screened or after		
	the X-Ray equipment is switched on to		
	ensure that the equipment is working		
	properly. If the image is satisfactory the		
	equipment may be used.		
	c. The CTP may be viewed by using image		
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	enhancing facility till the operator is satisfied	
	that the machine is working properly. The optimum position of CTP on the belt will	
	depend on X-Ray source and detector	
	arrangements. This may be ascertained from	
	the service engineer, if need arises.	
h)	RESULTS:	
	The results of the test should be recorded giving	
	information like date, time, machine number and	
	type, supervisors name and other remarks.	
4.	THREAT IMAGE PROJECTION (TIP)	
4.1.	General:	
	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 superimposed on 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 authorised person.	Tender and shall be verified by the Inspector.
4.2.	Design of the system	
	i. TIP software should be compatible with	
	other X-ray technologies such as Automatic	The street carrie are recrimed blu bocurrent
	Reject Unit, Automatic Threat Recognition	Scrutiny
	System etc. All x-ray image functions must	
	be available at	

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the same time along with the TIP.	
ii. Image Library	
1. The TIP facility should have an image library containing at least 100 explosive devices, 100 knives and 100 fire arms in various sizes, shapes, locations & orientations. However, the system shall have facility to expand the library to incorporate additional images by user without assistance of the manufacturer.	Pass: □/Fail: □
	Pass: □/Fail: □
iii. Time Interval	
1. Programming facility shall be available to project threat images in different intervals. 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% of knives or Random etc.	Pass: □/Fail: □
2. Once the screener has responded to identity 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.	Pass: □/Fail: □

iv) System Administration		
 The threat image projection facility shall have details of user data-base such Station name, Screener name, Organization, user ID number, level of access such as Screener, Administrator, Maintenance & Password, etc. 	To be practically demonstrated by the Bidder and shall be verified by the Inspector	Pass: □/Fail: □
2. 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.		Pass: □/Fail: □
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.	To be practically demonstrated by the Bidder and shall be verified by the Inspector	Pass: □/Fail: □
v) Feed Back Report		
1. 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 practically demonstrated by the Bidder and shall be verified by the Inspector	Pass: □/Fail: □
2. 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	To be practically demonstrated by the Bidder for all three conditions, i.e. HIT, MISS & FALSE ALARM, and shall be verified by the Inspector	Pass: □/Fail: □

identify the Threat Image Projection Image. 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.		
 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 practically demonstrated by the Bidder for all three conditions, i.e. HIT, MISS & FALSE ALARM, and shall be verified by the Inspector	Pass: □/Fail: □
4. The system shall automatically prepare the daily log of events for each shift and for each Screener performance. TIP log shall include particulars of Station, XBIS, Name of Screener, Time & date of threat image, whether threat image was successfully identified or missed etc.	To be practically demonstrated by the Bidder, and shall be verified by the Inspector	Pass: □/Fail: □
5. 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, number of bags screened, categories such as explosive devices knife or weapon etc.	The features as per the tender requirements shall be demonstrated by the Bidder, and verified by the Inspector.	Pass: □/Fail: □

1	As a standard practice, daily/weekly/monthly report shall be retrieved. Report shall be for any given time and period, as per command.	The features as per the tence requirements shall be demonstrated by the Bidder, and verified by the Inspector.
	 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. 	The features as per the tencer requirements shall be demonstrated by the Bidder, and verified by the Inspector.
5.1	The system shall have facility –	

	a. To substitute the bad (failed) detector diodes from the display of good ones, and hence, the system shall prompt the warning on the screen regarding such bad diodes during each power up sequence. The features as per the tender requirements demonstrated by the Bidder and verified Inspector.	Pass: ɒ/Fail: ɒ
	b. Automatically detect arcs, low/high anode voltage, low/high anode current and over current errors on the X-ray controller and shall prompt an error window indicating a fault, and to allow changeable password for accessing to the service menu functions The features as per the tender requirements demonstrated by the Bidder, and verified Inspector.	
5.2	In case of defective diode arrays , scanning should be disabled and error message should be displayed on the screen. The features as per the tender requirements demonstrated by the Bidder, and verified Inspector.	

	TECHNICAL MANUALS/ DOCUMENTATION	To be checked by inspectors
		REMARKS:
tronic Te	st equipment shall have valid calibration certificate from a	
tronic Te	is required for the rechnical Demonstration.	
tronic Te	st equipment shall have valid calibration certificate from a	
tronic Te	st equipment shall have valid calibration certificate from a	
tronic Te	st equipment shall have valid calibration certificate from a	ent, Test Bags/Objects, Certified Explosive/Narcotic Simulant/Sample, compatible accredited laboratory.

