

No. IV-21011/5/2008-Prov-I
Government of India
Ministry of Home Affairs

New Delhi, 26.5.2008

To

The DGs: Assam Rifles/BSF/CISF/CRPF/ITBP/NSG/SSB/BPR&D

Subject:- QRs/Technical Specifications of the X-Ray Baggage Inspection System.

The QRs/Technical Specifications of the X-Ray Baggage Inspection System has been accepted by the Competent Authority in MHA.

2. Henceforth, all the CPMFs should procure the above items required by them strictly as per the laid down Technical Specifications/QRs.

(R.S.Sharma)
Director (Prov)

Copy to:-

DD(Procurement),MHA

Copy for information to:-

1.PS to JS(PM),MHA

2. Dir(Prov), MHA

QRs/specifications of the X-Ray Baggage Inspection System

1	Tunnel size - 150 cm W(width) x 180cm H(Height)+/- 10%
2	Conveyor Height - 300 mm
3	Conveyor belt speed should be between 0.18 and 0.3 meter per second . For cargo machine inputs and output roller should be motor driven enabling easy handling of the heavy cargo. Conveyor movement bidirectional.
4	All machines should operate on 230 VAC, 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170V to 260 V. Single Phase, 3 to 5 Amp.
5	Conveyor Capacity- More than 1000 kg or more
6	Sensors > 1000 diodes, L-shaped detector (Folded array type), In case of defective diode arrays, scanning should be disabled and error message should be displayed on the screen.
7	X-Ray Voltage - 140 to 160 KV
8	Duty Cycle - 100%
9	Cooling - Sealed oil bath
10	The X-ray beam divergence should be such that the complete image at maximum size of bag is displayed without corner cuts.
11	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.
12	The operating temperature should be -10 degree C to 40 degree C
13	Storage temperature -20 degree C to 50 degree C.
14	Humidity- 90% non-condensing
15	Resolution: The machine should be able to display single un-insulated tinned copper wire of 40-SWG. All penetration and resolution condition should be met without pressing any functional key and should be online.
16	Penetration should be 26 mm thickness of steel or more.
17	Continuous Electronic Zoom facility should be available to magnify the chosen area of an image eight times (8X) or more. Image features shall be keyboard controllable.
18	Video display- 17"LCD Monitor or 17" CRT monitor SVGA High resolution, low radiation, flicker free, resolution at least 1280 x 1024, 24 bit colour real time processing.
19	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.
20	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 relevant certificate from Atomic Energy Regulatory Board of India regarding radiation safety. The company manufacturing the equipment should have ISO certification for manufacturing and serving of X-ray Screening machines.
21	Film_Safety Guaranteed safety for high-speed films up to ISO1600. The machines should be film safe. In other words photographic films must not be damaged due to x-ray examination.
22	Machine should be rodent protected Dust proof cover is to be provided for covering when system is not in use.
23	Facility for variable contrast must be incorporated to allow enhancement lighter and darker portion of the image.
24	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.
25	Through put should be 200 bags per hour or more
26	Full diagnostic built in test facility. All models should have software controlled diagnosis report facility and system should give printout if printer is connected.
27	All software features of machine should be online and password protected.

28	Machine should be capable for recalling 15-20 previous images,
29	It should have the capability of archiving 3000-4000 images.
30	Control desk with security housing and locking provision should be available. The operator personal identification number can be entered the keyboard.
31	Facility of image enhancement should be available.
32	All models should have online recording facility and images can be recorded in CD R/W
33	Lead impregnated safety screens should be available at either ends of the tunnel. Idle rollers to be provided at either ends of the tunnel to facilitate placing of baggage at input and output.
34	System should work on one software only. All software features should be controlled from key board of machine only. Keyboard function should be user friendly. To enable/disable the software features system should not be rebooted
35	If the machine fails to penetrate a particular item then an alarm video and audio both should be generated to notify the operator
36	The threat image projection (TIP) system software to be incorporated in all X-Ray BIS operation as per details given in Annexure-I.
37	Copy of all software including X-Ray Software with recovery CD must be provided.
38	Operational Training- Operating staff has to be provided free training
39	One operating & service manual shall be provided with each machine
40	Other Features a) Edge & variable edge enhancement. b) Inverse Video c) Fast initial warm-up. d) Pseudo colour e) Date & Time display.
41	Computer: Intel V Pro Configuration: i. CPU: Intel Core 2 Duo 6300, 1.86 GHz, 2 MB L2 Cache and 1066 MHz FSB. ii. Motherboards: Intel Q 965/Nvidia chip set, 7025 or better on OEM Motherboard. iii. Bus Architecture : Integrated Graphics, 2 PCI, 1 PCI Express x 1 and 1 PCI BXpress x 16 iv. Memory : 2x512 MB 533 MHz DDR2 RAM with minimum 4 total DIMM slots. v. Hard Disk Drive : 160 GB 7200 rpm serial ATA HDD. vi. Mouse : Optical vii. Bays : 4 Nos (2 Nos 5.25 inches for Optical Media Drives and 2 Nos 3.5 inches for Hard Disk Drives) viii. Ports : 6 USB Ports (with at least 2 in Front), 1 Serial Port, 1 Parallel port, 1 PS/2 Key Board and 1 PS2 Mouse Port, audio ports for microphone and headphone in front. ix. Cabinet : Mini tower x. DMI : DMI 2.0 compliance and support. xi. CD-R/RW Drive : CD Writer xii. Networking facility : 10/100/1000 on board integrated Network Port with remote booting facility remote system installation, remote wake up, out of bad management using any standard management software. xiii. Operating System : Windows Vista Business reloaded with Media and Documentation and Certificate of Authenticity. xiv. OS Certifications : Win Logo Vista Business OS and Linux Certifications. xv. Power Management : Screen Blanking, Hard Disk and System Idle Mode in Power On, Set up Password, Power Supply SMPS Surge protected. xvi. Preloaded Software: Norton, McAfee, E-Trust or equivalent Antivirus (Latest Version) with one year License.
	UPS: - 3 KVA online with back-up time of ½ hour.

ANNEXURE - I

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 operators 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.
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 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% knives or random etc.
6	Once the screener has responded to identify the computer generated threat image, it should remain on the screen for a predefined user programmatic 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 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 that he/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 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.

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 each Screener performance. TIP log shall include particulars of Name of Screener, Time & date of threat image, whether 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/out come 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.
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 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.

TECHNICAL SPECIFICATIONS OF X-RAY BAGGAGE INSPECTION SYSTEM (Large size)

	Tunnel Size - 100 cm W (width) x 100 cm H(Height) +/-10%
	Conveyor belt speed should be between 0.18 and 0.3 meter per second. Conveyor movement bidirectional.
	All machines should operate on 230 VAC, 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170V to 260 V. Single Phase, 3 to 5 Amp.
	Conveyor Capacity- 200 kg or more
	Sensors > 1000 diodes, L-shaped detector (Folded array type), In case of defective diode arrays, scanning should be disabled and error message should be displayed on the screen.
	X-Ray Voltage - 140 KV or more
	X-Ray Source/Generator – It should be capable to operate smoothly for a period of at least six years.
	Duty Cycle - 100%
	Cooling - Sealed oil bath
	The X-ray beam divergence should be such that the complete image at maximum size of bag is displayed without corner cuts.
	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.
	The operating temperature should be -10 deg C to 50 deg C.
	Storage temperature -20 degree C to 50 degree C.
	Humidity- 90% non-condensing
	Resolution: The machine should be able to display single un-insulated tinned copper wire of 40-SWG or 36 AWG. All penetration and resolution condition should be met without pressing any functional key and should be online.
	Penetration should be 26 mm thickness of steel (Guaranteed) or more.
	Continuous Electronic Zoom facility should be available to magnify the chosen area of an image eight times (8X) or more. Image features shall be keyboard controllable.
	Video display - 17” LCD Monitor or 17” CRT monitor SVGA High resolution, low radiation, flicker free, resolution at least 1280 x 1024, 24 bit colour real time processing.
a	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.
	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 relevant certificate from Atomic Energy Regulatory Board of India regarding radiation safety. The company manufacturing the equipment should have ISO certification for manufacturing and servicing of X-ray Screening machines.
	Film_Safety:- Guaranteed safety for high-speed films up to ISO1600. The machines should be film safe. In other words photographic films must not be damaged due to x-ray examination.
	Machine should be rodent protected. Dust proof cover is to be provided for covering when system is not in use.
	Facility for variable contrast must be incorporated to allow enhancement lighter and darker portion of the image.
	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.

	Through put should be 200 bags per hour or more
	Full diagnostic built in test facility. All models should have software controlled diagnosis report facility and system should give printout if printer is connected.
	All software features of machine should be online and password protected.
	Machine should be capable for recalling 15-20 previous images,
	It should have the capability of archiving 2000-3000 images with date & time stamp.
	Control desk with security housing and locking provision should be available. The operator personal identification number can be entered the keyboard along with generation of log.
	Facility of image enhancement should be available.
	All models should have online recording facility and images can be recorded in CD R/W.
	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.
	System should work on one software only. All software features should be controlled from key board of machine only. Keyboard function should be user friendly. To enable/disable the software features system should not be rebooted
	If the machine fails to penetrate a particular item then an alarm video and audio both should be generated to notify the operator
	The threat image projection (TIP) system software to be incorporated in all X-Ray BIS operation as per details given in Annexure-I.
	Copy of all software including X-Ray Software with recovery CD must be provided.
	Operational Training- Operating staff has to be provided free training.
	One operating & service manual shall be provided with each machine.
	Other Features Edge & variable edge enhancement. Inverse Video Set up time not more than 10 minutes. Pseudo colour Date & Time display.
	Minimum Computer configuration: - <u>Intel V Pro Configuration:</u> 1. CPU : Intel Core 2 Duo 6300, 1.86 GHz, 2 MB L2 cache and 1066 MHz FSB. 2. Motherboards : Intel Q 965/Nvidia chip set, 7025 or better on OEM Motherboard. 3. Bus Architecture : Integrated Graphics, 2 PCI, 1 PCI Express x 1 and 1 PCI Bxpress x 16. 4. Memory : 2 x 512 MB 533 MHz DDR2 RAM with minimum 4 total DIMM slots. 5. Hard Disk Drive : 160 GB 7200 rpm serial ATA HDD. 6. Mouse : Optical 7. Bays : 4 Nos. (2 Nos. 5.25 inches for Optical Media Drives and 2 Nos. 3.5 inches for Hard Disk Drives.) 8. Ports : 6 USB Ports (with at least 2 in Front), 1 Serial Port, 1 Parallel port, 1 PS/2 Keyboard and 1 PS2 Mouse Port, audio ports for microphone and headphone in front. 9. Cabinet : Mini tower. 10. DMA : DMA 2.0 compliance and support. 11. CD-R/RW Drive : CD Writer. 12. Networking facility : 10/100/1000 on board integrated Network Port with

	<p>remote booting facility remote system installation, remote wake up, out of band management using any standard management software.</p> <p>13. Operating system : Windows Vista Business Or Linux (REDHATELS or FEDORA8 or any other latest version) preloaded with Media and Documentation and Certificate of Authenticity.</p> <p>14. OS Certifications : Win Logo Vista Business OS or Linux Certifications.</p> <p>15. Power Management : Screen Blanking, Hard Disk and System Idle Mode in Power On, Set up password, Power Supply SMPS Surge protected.</p> <p>16. Preloaded Software : Norton, McAfee, ETrust or equivalent Antivirus (Latest Version) with one year License.</p> <p>.</p>
	<p>UPS: - 3 KVA online with back-up time of ½ hour.</p>

TECHNICAL SPECIFICATIONS OF X-RAY BAGGAGE INSPECTION SYSTEM (Medium Size)

1.	Tunnel Size - 60 cm W (width) x 40 cm H(Height) +/-10%
2.	Conveyor belt speed should be between 0.18 and 0.3 meter per second. Conveyor movement bidirectional.
3.	All machines should operate on 230 VAC, 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170V to 260 V. Single Phase, 3 to 5 Amp.
4.	Conveyor Capacity- 100 kg or more
5.	Sensors > 1000 diodes, L-shaped detector (Folded array type), In case of defective diode arrays, scanning should be disabled and error message should be displayed on the screen.
6.	X-Ray Voltage - 140 KV or more
7.	X-Ray Source/Generator – It should be capable to operate smoothly for a period of at least six years.
8.	Duty Cycle - 100%
9.	Cooling - Sealed oil bath
10.	The X-ray beam divergence should be such that the complete image at maximum size of bag is displayed without corner cuts.
11.	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.
12.	The operating temperature normally should be -10 deg C to 50 deg C.
13.	Storage temperature -20 degree C to 50 degree C.
14.	Humidity- 90% non-condensing
15.	Resolution: The machine should be able to display single un-insulated tinned copper wire of 40-SWG or 36 AWG. All penetration and resolution condition should be met without pressing any functional key and should be online.
16.	Penetration should be 26 mm thickness of steel (Guaranteed) or more.
17.	Continuous Electronic Zoom facility should be available to magnify the chosen area of an image eight times (8X) or more. Image features shall be keyboard controllable.
18.	Video display - 17" LCD Monitor or 17" CRT monitor SVGA High resolution, low radiation, flicker free, resolution at least 1280 x 1024, 24 bit colour real time processing.
19.	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
20.	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 relevant certificate from Atomic Energy Regulatory Board of India regarding radiation safety. The company manufacturing the equipment should have ISO certification for manufacturing and servicing of X-ray Screening machines.
21.	Film Safety Guaranteed safety for high-speed films up to ISO1600. The machines should be film safe. In other words photographic films must not be damaged due to x-ray examination.
22.	Machine should be rodent protected. Dust proof cover is to be provided for covering when system is not in use.
23.	Facility for variable contrast must be incorporated to allow enhancement of lighter and darker portion of the image.
24.	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.
25.	Through put should be 200 bags per hour or more
26.	Full diagnostic built in test facility. All models should have software controlled diagnosis

	report facility and system should give printout if printer is connected.
27.	All software features of machine should be online and password protected.
28.	Machine should be capable for recalling 15-20 previous images,
29.	It should have the capability of archiving 3000-4000 images with date & time stamp.
30.	Control desk with security housing and locking provision should be available. The operator personal identification number can be entered the keyboard along with generation of log.
31.	Facility of image enhancement should be available.
32.	All models should have online recording facility and images can be recorded in CD R/W.
33.	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.
34.	System should work on one software only. All software features should be controlled from key board of machine only. Keyboard function should be user friendly. To enable/disable the software features system should not be rebooted
35.	If the machine fails to penetrate a particular item then an alarm video and audio both should be generated to notify the operator
36.	The threat image projection (TIP) system software to be incorporated in all X-Ray BIS operation as per details given in Annexure-I.
37.	Copy of all software including X-Ray Software with recovery CD must be provided.
38.	Operational Training- Operating staff has to be provided free training.
39.	One operating & service manual shall be provided with each machine.
40.	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.
41.	Minimum Computer Configuration: - <u>Intel V Pro Configuration:</u> 1. CPU : Intel Core 2 Duo 6300, 1.86 GHz, 2 MB L2 cache and 1066 MHz FSB. 2. Motherboards : Intel Q 965/Nvidia chip set, 7025 or better on OEM Motherboard. 3. Bus Architecture : Integrated Graphics, 2 PCI, 1 PCI Express x 1 and 1 PCI Bxpress x 16. 4. Memory : 2 x 512 MB 533 MHz DDR2 RAM with minimum 4 total DIMM slots. 5. Hard Disk Drive : 160 GB 7200 rpm serial ATA HDD. 6. Mouse : Optical 7. Bays : 4 Nos. (2 Nos. 5.25 inches for Optical Media Drives and 2 Nos. 3.5 inches for Hard Disk Drives.) 8. Ports : 6 USB Ports (with at least 2 in Front), 1 Serial Port, 1 Parallel port, 1 PS/2 Keyboard and 1 PS2 Mouse Port, audio ports for microphone and headphone in front. 9. Cabinet : Mini tower. 10. DMA : DMA 2.0 compliance and support. 11. CD-R/RW Drive : CD Writer. 12. Networking facility : 10/100/1000 on board integrated Network Port with remote booting facility remote system installation, remote wake up, out of band management using any standard management software. 13. Operating system : Windows Vista Business Or Linux (REDHATELS or FEDORA8 or any other latest version) preloaded with Media and Documentation and Certificate of Authenticity.

	<p>14. OS Certifications : Win Logo Vista Business OS or Linux Certifications.</p> <p>15. Power Management : Screen Blanking, Hard Disk and System Idle Mode in Power On, Set up password, Power Supply SMPS Surge protected.</p> <p>16. Preloaded Software : Norton, McAfee, ETrust or equivalent Antivirus (Latest Version) with one year License.</p>
42.	UPS: - 2 KVA online with back-up time of ½ hour.

TECHNICAL SPECIFICATIONS OF X-RAY BAGGAGE INSPECTION SYSTEM (Small size)

1.	Tunnel Size - 50 cm W (width) x 30 cm H(Height) +/-10%
2.	Conveyor belt speed should be between 0.18 and 0.3 meter per second. Conveyor movement bidirectional.
3.	All machines should operate on 230 VAC, 50 Hz power supply and should be able to withstand voltage fluctuations in the range of 170V to 260 V. Single Phase, 3 to 5 Amp.
4.	Conveyor Capacity- 50 kg or more
5.	Sensors > 440 diodes, L-shaped detector (Folded array type), In case of defective diode arrays, scanning should be disabled and error message should be displayed on the screen.
6.	X-Ray Voltage - 80 KV or more
7.	X-Ray Source/Generator – It should be capable to operate smoothly for a period of at least six years.
8.	Duty Cycle - 100%
9.	Cooling - Sealed oil bath
10.	The X-ray beam divergence should be such that the complete image at maximum size of bag is displayed without corner cuts.
11.	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.
12.	The operating temperature should be -10 deg C to 50 deg C .
13.	Storage temperature -20 degree C to 50 degree C.
14.	Humidity- 90% non-condensing
15.	Resolution: The machine should be able to display single un-insulated tinned copper wire of 40-SWG or 36 AWG. All penetration and resolution condition should be met without pressing any functional key and should be online.
16.	Penetration should be 10 mm thickness of steel (Guaranteed) or more.
17.	Continuous Electronic Zoom facility should be available to magnify the chosen area of an image eight times (8X) or more. Image features shall be keyboard controllable.
18.	Video display - 17” LCD Monitor or 17” CRT monitor SVGA High resolution, low radiation, flicker free, resolution at least 1280 x 1024, 24 bit colour real time processing.
19.	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.
20.	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 relevant certificate from Atomic Energy Regulatory Board of India regarding radiation safety. The company manufacturing the equipment should have ISO certification for manufacturing and servicing of X-ray Screening machines.
21.	Film Safety Guaranteed safety for high-speed films up to ISO1600. The machines should be film safe. In other words photographic films must not be damaged due to x-ray examination.
22.	Machine should be rodent protected. Dust proof cover is to be provided for covering when system is not in use.
23.	Facility for variable contrast must be incorporated to allow enhancement of lighter and darker portion of the image.
24.	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.
25.	Through put should be 200 bags per hour or more
26.	Full diagnostic built in test facility. All models should have software controlled diagnosis

	report facility and system should give printout if printer is connected.
27.	All software features of machine should be online and password protected.
28.	Machine should be capable for recalling 15-20 previous images,
29.	It should have the capability of archiving 3000-4000 images with date & time stamp.
30.	Control desk with security housing and locking provision should be available. The operator personal identification number can be entered the keyboard along with generation of log.
31.	Facility of image enhancement should be available.
32.	All models should have online recording facility and images can be recorded in CD R/W.
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34.	System should work on one software only. All software features should be controlled from key board of machine only. Keyboard function should be user friendly. To enable/disable the software features system should not be rebooted
35.	If the machine fails to penetrate a particular item then an alarm video and audio both should be generated to notify the operator
36.	The threat image projection (TIP) system software to be incorporated in all X-Ray BIS operation as per details given in Annexure-I.
37.	Copy of all software including X-Ray Software with recovery CD must be provided.
38.	Operational Training- Operating staff has to be provided free training.
39.	One operating & service manual shall be provided with each machine.
40.	Other Features <ul style="list-style-type: none"> a) Edge & variable edge enhancement. b) Inverse Video c) Set up time not more that 10 minutes d) Pseudo colour e) Date & Time display.
41.	<p>Minimum Computer Configuration: - <u>Intel V Pro Configuration:</u></p> <ol style="list-style-type: none"> 1. CPU : Intel Core 2 Duo 6300, 1.86 GHz, 2 MB L2 cache and 1066 MHz FSB. 2. Motherboards : Intel Q 965/Nvidia chip set, 7025 or better on OEM Motherboard. 3. Bus Architecture : Integrated Graphics, 2 PCI, 1 PCI Express x 1 and 1 PCI Bxpress x 16. 4. Memory : 2 x 512 MB 533 MHz DDR2 RAM with minimum 4 total DIMM slots. 5. Hard Disk Drive : 160 GB 7200 rpm serial ATA HDD. 6. Mouse : Optical 7. Bays : 4 Nos. (2 Nos. 5.25 inches for Optical Media Drives and 2 Nos. 3.5 inches for Hard Disk Drives.) 8. Ports : 6 USB Ports (with at least 2 in Front), 1 Serial Port, 1 Parallel port, 1 PS/2 Keyboard and 1 PS2 Mouse Port, audio ports for microphone and headphone in front. 9. Cabinet : Mini tower. 10. DMA : DMA 2.0 compliance and support. 11. CD-R/RW Drive : CD Writer. 12. Networking facility : 10/100/1000 on board integrated Network Port with remote booting facility remote system installation, remote wake up, out of band management using any standard management software. 13. Operating system : Windows Vista Business Or Linux (REDHATELS or FEDORA8 or any other latest version) preloaded with Media and Documentation and Certificate of Authenticity.

	<p>14. OS Certifications : Win Logo Vista Business OS or Linux Certifications.</p> <p>15. Power Management : Screen Blanking, Hard Disk and System Idle Mode in Power On, Set up password, Power Supply SMPS Surge protected.</p> <p>16. Preloaded Software : Norton, McAfee, ETrust or equivalent Antivirus (Latest Version) with one year License.</p>
42.	UPS: - 2 KVA online with back-up time of ½ hour.