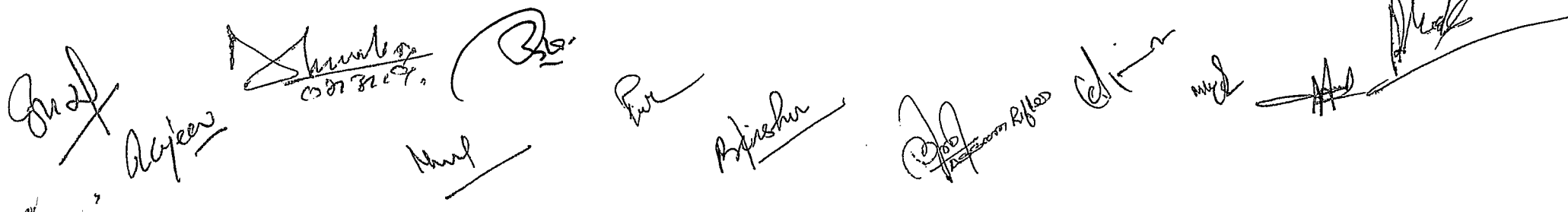


**REVISED QRS/TDS OF HAND HELD THERMAL IMAGER (COOLED VERSION)**

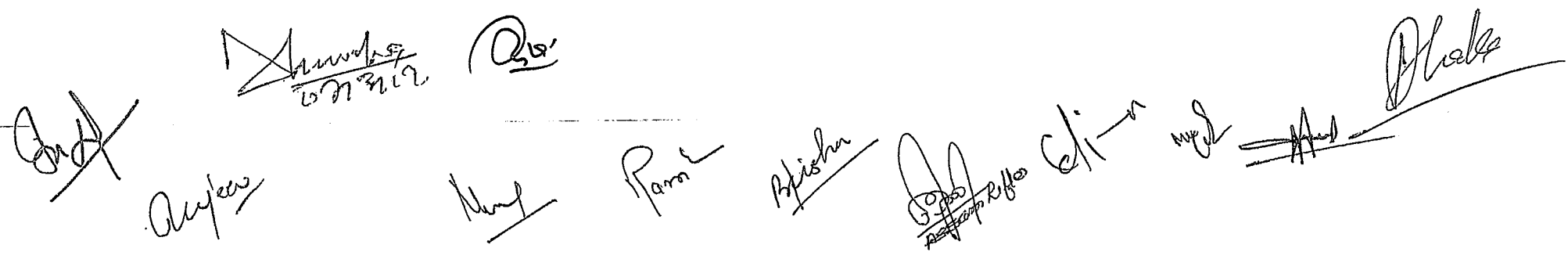
S. No.	Specification	Procedure suggested for trial for BOO	Result expected/desired
1.	<b>GENERAL DESCRIPTION:</b> a) Be binocular /biocular b) Have capability to produce real time picture c) Should be rugged for operations as per JSS 55555 or MIL 810 F and comply IP 65 or better standards. d) Should have a ruggedized / customized container for transportation	To be physically checked by the BOO for binocular/ biocular.  To be physically checked by BOO on Eye Piece as well as on external device.  Firm has to submit National /International accredited Lab certificate. If no such lab available in India then , firm has to submit any Indian Govt Lab/OEM certificate in respect of the same.  To be physically checked by the BOO.  Transportation case placed at a height of minimum 2 mtr with HHTI inside and drop on a hard surface. Transportation case should not be deformed and have any crack. Eqpt should work properly.	HHTI must be binocular / biocular  It must produce real time picture.  System must be rugged for operations as per JS55555 or 810 F MIL and IP 65 or better standards.  Transportation case should not be deformed and have any crack. Eqpt should work properly.
	e) Penetrate darkness, haze and smoke	Switch on the system in different conditions like full dark night, haze and smoke and observe the image on external LCD/LED screen. For creating the smoke condition BOO should use smoke candles. Sensor should work in all condition.	HHTI must be capable to see through darkness, haze and smoke .


 A series of handwritten signatures and initials are present at the bottom of the page. From left to right, they include: a signature that appears to be 'Guraj', a signature 'Acykers', a signature 'Shankar' with 'CS 01 31 07' written below it, a signature 'B.S.', a signature 'Murali', a signature 'Pur', a signature 'Arishan', a signature 'D. J. D.' with '2010' and '2011' written below it, a signature 'Rajesh', a signature 'Mud', and a signature 'Mud' with a long horizontal line extending to the right.

f) Not get damaged if faced towards sun accidentally.	Switch on the system and direct towards the sun for 2 to 3 seconds. After this system should work properly.	It must not get damaged if faced towards sun accidentally.
g) Be immune to glare of searchlights.	Switch on the searchlight and throw its beam towards HHTI in operational mode for 2 to 3 sec. After this system should work properly.	It must be immune to glare of searchlights.
h) Have a suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision.	To be physically checked by the BOO	It must have suitable tint to reduce eyestrain this feature should help the observer to quickly regain his normal vision.
i) Weight of HHTI without optional modules and battery : 3.5 Kg HHTI with all optional modules and without battery : 4.5 Kg.	To be physically checked by the BOO.	Weight of the system must be 3.5 Kg or less without optional modules and battery and 4.5 Kg with all optional modules and without battery
j) Should be able to be fixed on tripod as well as Pole, Tower or Mast or otherwise as specified by the user Dept. Interface to be provided by firm.	To be physically checked by the BOO. An undertaking in this regard should also be obtained from the firm.	It must be able to be fixed on Tripod, pole, tower and mast. (To be specified by the user at the time of tender).
k) Provision for switch ON/OFF of internal display (Eye piece assembly) through console unit of HHTI as well as C2 (for CIBMS compliant)	To be physically checked by the BOO.	It must have Provision for switch ON/OFF of internal display (Eye piece assembly) through console unit of HHTI as well as C2 (for CIBMS compliant).
l) All keys and controls should be provided on top of the HHTI and also through IP network to C2 console for CIBMS	To be physically checked by the BOO.	All keys and controls must be provided on top of the HHTI and also through IP network to C2 console for CIBMS compliant version.



	Digital Zoom : 4x or better		
f)	The HHTI initialization time should not be more than 8 minutes	To be physically checked by the BOO	Initialization time of the system must not be more than 8 minutes.
g)	Reticule for range estimation : in built	To be physically checked by the BOO	It must have inbuilt reticule for range estimation
h)	Automatic and manual focusing facility.	To be physically checked by the BOO The system should be auto focus in both FOV when the user change the field of view as well as manually focus on particular targets.	It must have facility of Automatic and manual focusing.
i)	Non Uniformity Calibration (NUC).	To be physically checked by the BOO for NUC facility .OEM certificate also required	It must have NUC.
j)	Polarity (black Hot and white Hot)	To be physically checked by the BOO	It must have Polarity (black Hot and white Hot)
k)	It should have provision for external video output (PAL). (Through BNC connector for hand held version only)	To be physically checked by the BOO	There must be a provision for connecting HHTI with external video monitor through BNC connector.
l)	Warranty on IR Sensor should be 04 years or 10000 working hrs whichever is earlier.	Check the undertaking certificate submitted by the firm regarding warranty of the IR Sensor	warranty of IR sensor must not less than 4 years or 10000 working hrs whichever is earlier.


 A collection of handwritten signatures and initials in black ink, including names like 'Anand', 'Ajay', 'Nand', 'Ran', 'Ajish', 'Gopinath', 'Gopinath', 'Ajay', and 'Dhaka'.

<b>Operational :</b>		
a) <b>Range for human target</b> Detection : 3 Km	<b>Detection :</b> Move a group of 03 persons at a distance of 3 Km. HHTI should detect the movement.  Detection means :- ability to detect vehicles ,structures (man made/normal) and any movement of man or animal.	Human target detection, recognition and identification through HHTI must be achieved as per para-3(a)
Recognition : 1.5 Km	<b>Recognition:</b> Move group of 03 persons at a distance of 1.5 Km. HHTI should recognize the human being.  Recognition :- ability to differentiate between civilian/uniformed personnel with manpack.	
Identification : 500 Mtr.	<b>Identification:</b> Move group of 03 persons with weapons. HHTI should identify the presence of weapon with human being (rifle). Presence of man with weapon (rifle) raised overhead by the hand must be seen.  Identification may be restricted to identify the presence of human being with weapon (INSAS Rifle)	
b) <b>Range for Vehicle</b> Detection : 5 Km (min).	<b>Detection :</b> Place vehicle at a distance of 5 Km. HHTI should detect the movement of (broad side) of vehicle.	Vehicle detection and recognition through HHTI must be achieved as per para-3(b)
Recognition : 2.5 Km (min). <b>Note: Vehicle dimension minimum 4010 x 1540 x 1875</b>	<b>Recognition:</b> Place vehicle at a distance of 2.5 Km. HHTI should recognize the type of vehicle.	

A series of handwritten signatures and initials in black ink are located at the bottom of the page, below the table. The signatures are somewhat stylized and include names like 'Anurag', 'Ramesh', and others.

	mm (LxBxH)		
4.	<b>1) DAY CAMERA : (Optional to be specified by the user department)</b>		
	a. Colour Camera	Put the HHTI in normal mode so that only day camera image is displayed on the screen.	Must be Colour Camera
	b. Resolution : 754 X 576 (Min) or better	Firm has to submit National /International accredited Lab certificate. If no such lab available in India then , firm has to submit Indian Govt Lab /OEM certificate in respect of the same.	Resolution of camera must be 754 X 576 (Min) or better
	c. Optical zoom : 5x (min) or better continuous	To be physically check by the BOO. Check the optical zoom physically in the lab as per the procedure.	Optical zoom must be 5x continuous (min) or better
	d. Digital Zoom : 4x or better	Check the digital zoom physically in the lab as per the procedure.	Digital Zoom must be 4x or better
	e. Auto Focus/ Manual	Check the focusing mechanism provided for automatic and manual focusing.	System must be Auto /Manual Focus.

Sudh

Arjeer

X  
Sankar  
to Mr. B. L. E

Raj

Mun

Ram

Rajiv

S. S. S.  
S. S. S.  
S. S. S.

Chir

Mud

H

S. S. S.

<b>2) Range : Day Camera :</b>		
<b>a) Range for human target</b> Detection : 4 Km(min).	<b>Detection :</b> Move group of 03 persons at a distance of 4 Km. Day camera should detect the movement.	Detection, recognition and identification through Day Camera must be achieved as per para-4 (2) (a)
Recognition : 2 Km(min).	<b>Recognition :</b> Move group of 03 persons at a distance of 2 Km. Day camera should detect the Nos of persons with or without weapon (Rifle).	
Identification : 1 Km.(min).	<b>Identification :</b> Move group of 03 persons in different color uniform / dress with Rifle. Day camera should identify the presence of men with the colour of uniform / dress with rifle.	
<b>b) Range for Vehicle</b> Detection : 6Km (min).	<b>Detection :</b> Place medium Vehicle at distance of 6 Km. Day camera should detect the presence of moving vehicle (broad side).	Vehicle detection, recognition and identification through Day Camera must be achieved as per para-4 (2) (b)
Recognition : 3 Km (min)	<b>Recognition :</b> Place medium Vehicle at a distance of 3 Km. Day camera should recognize the type and class of vehicle.	
Identification : 1.5 Km.(min).	<b>Identification :</b> Place medium Vehicle at a distance of 1.5 Km. Day camera should identify type and class of vehicle with colour	
<b>5) EYE PIECE ASSEMBLY (for Hand held version only)</b>		

*Amr*  
*Arjeev*  
*Shruti*  
*Qas.*  
*Ram*  
*Nishu*  
*Chitra*  
*Mur*  
*Abh*  
*Dabe*

<b>(A) HHTI (Used as Handheld or on tripod)</b>		
a) Inter Pupillary Distance (IPD) : Adjustable	To be physically checked by the BOO	System must have adjustable Inter Pupillary Distance (IPD)
b) Internal display : Advance high resolution OLED display having resolution 640 x 480 or better.	Firm has to submit National /International accredited Lab certificate. If no such lab available in India then , firm has to submit any Indian Govt Lab/OEM certificate in respect of the same	System must have advance high resolution OLED internal display of resolution 640 x 480 or better.
<b>(B) HHTI TO BE INTEGRATED WITH CIBMS</b>		
a)Eye Piece assembly and internal display are not required.	To be physically checked by the BOO	Not required
6. <b>Operating temp Range :</b> a) -20 degree to +55 degree centigrade or better	Check the National/International Accredited lab certificate/report submitted by the firm in respect of operating Temp. BOO will also physically check in different climatic condition in the field (i.e. cold as well as hot)	The firm should provide National/International Accredited lab certificate/report in respect of temperature range of para 6 (a )& (b) . In case any doubt in the test report the veracity of the same may be checked from the concerned lab. System must be work in different climatic condition in the field (i.e cold as well as hot )
<b>Storage temp Range :</b> b) -30 degree to +60 degree centigrade or better	Check the National/International Accredited lab certificate/report submitted by the firm in respect of operating Temp.	
7. <b>Network Connectivity : (Optional -to be specified by the user department)</b>		
a) Ability to integrate with available IP Network through Ethernet with Video streaming and Video recording.	To be physically checked by BOO for integration with available IP Network through Ethernet with Video streaming & Video recording.	Must be able to integrate with available IP network through Ethernet with Video streaming and Video recording

Sanjay  
Arya

Sanjay  
Arya

Ravi

Ravi

Ravi

Ravi

Ravi

Ravi





whenever software gets corrupted.	assurance certificate in respect of the same	corrupted.
e. The console should have the provision to control the operation of day & night camera and Pan & Tilt system.	Repeat the procedure suggested at para 8(c) and check the function of cameras and Pan & Tilt sub systems.	The console must have the provision to control the operation of day & night camera and Pan & Tilt system .
f. The console should have scan around facility and automatically scan the operator defined sector whenever required. (In case system has integrated with DMC).	Check the system for automatic scan around facility.	The console must have scan around facility and automatically scan the operator defined sector whenever required. (In case system has integrated with DMC).
g. The console must incorporate built in test equipment (BITE)	Check the system for BITE facility physically.	The console must have built in test equipment (BITE).
h. Should have ports for external PC interface, Ethernet , digital & analogue video out.	Check the system for External PC interface, Ethernet and digital & analogue video output ports.	System must have ports for external PC interface, Ethernet , digital & analogue video out.
i. Console should have suitable power adaptor.	To be physically checked by BOO.	Suitable power adaptor must be provided.
j. Video Recording Capability (Optional- to be specified by the user department)Advanced inbuilt storage memory of 1TB (min) exclusively to store the video should be provided in the console. The system should have facility to retrieve the stored data.	Check the inbuilt storage memory exclusively to store the video in the console.  Check the Console for the facility to retrieve the storage data.	Video Recording Capability advanced inbuilt storage memory of 1TB (min) exclusively to store the video must be provided in the console. The system must have facility to retrieve the stored data.

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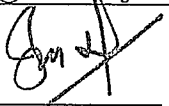
<p>12.</p>	<p><b>Global Positioning System (GPS) : (Optional- to be specified by the user department)</b></p>	<p>Inbuilt GPS to provide own position during initialization. It should give co-ordinates in Lat-Long and Indian Military GR system. Accuracy should be 05 meters (Maximum).</p>	<p>Switch 'ON' the HHTI and co-ordinates of own position through inbuilt GPS. Check the own position co-ordinates of a point by other GPS and compare it with the co-ordinates of the same point shown by the inbuilt GPS.</p>	<p>Inbuilt GPS to provide own position during initialization. It should give co-ordinates in Lat-Long and Indian Military GR system. Accuracy should be 05 meters (Max).</p>
<p>13.</p>	<p><b>In built Laser Range Finder : (Optional- to be specified by the user department)</b></p> <p>In built LRF (class 1 eye safe) should be provided for finding range of any target/object upto 6000 meters or better with accuracy of ± 5 Mtrs or better.</p>	<p>To be physically checked by BOO. To check the LRF the target size will be medium vehicle size (4010 X 1540 X 1875 mm) park side ways. Firm has to submit National /International accredited Lab certificate. If no such lab available in India, then , firm has to submit any Indian Govt Lab / OEM certificate in respect of class 1 eye safe.</p>	<p>In built LRF (class 1 eye safe) must be provided for finding range of any target/object upto 6000 meters or better with accuracy of ± 5 Mtrs or better.</p>	
<p>14</p>	<p><b>POWER SOURCE:</b></p> <p>It should Function on 110 volt to 270 volt, 50 Hz AC mains through AC/DC Adopter or UPS with Stabilizer. UPS backup with 30 Minutes only for CIBMS compliant system.</p>	<p>Connect the AC/DC adopter on 50 Hz variable AC mains supply and check the output voltage by varying the in-put voltage from 110 to 270 volts. Bty backup of UPS for 30 Minutes to be checked physically.</p>	<p>It must function on 110 volt to 270 volt, 50 Hz AC mains through AC/DC Adopter or UPS with Stabilizer. UPS backup with 30 Minutes only for CIBMS compliant system.</p>	
<p><b>FOR HHTI IN HAND HELD ROLE ONLY :-</b></p>				
	<p><b>(i) Battery :</b></p> <p>Should have rechargeable Lithium-ion/Lithium polymer battery or better to operate the system. Battery charge indication</p>	<p>To be physically checked by the BOO</p> <p>Check the battery provided for operating the system for its type and recharge ability.</p> <p>Check the battery for the battery status</p>	<p>The system must be operated with rechargeable Lithium-ion/Lithium polymer battery. Battery charge indication must be provided on screen.</p>	

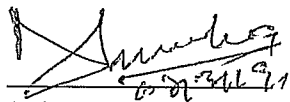
	should be on screen.	indication on screen	
	<p><b>(ii) Battery performance :</b></p> <p>The battery(s) should be able to run the system for 3 hours or more in operation mode on single charge.</p>	<p>To be physically checked by the BOO</p> <p>Operate the system with fully charged rechargeable battery(s) and put it in the operation mode. Start the counting of functional hours in stop watch.</p>	<p>Rechargeable battery(s) must run the system for 3 hrs or more in operational mode on single charge.</p>
	<p><b>(iii) Spare batteries :</b></p> <p>For additional cycle of operation, 03 spare batteries be provided.</p>	<p>Undertaking be given by the firm.</p>	<p>System must be provided with 3 spare batteries.</p>
	<p><b>iv) Battery charger :</b></p> <p>A smart and intelligent, universal charger for charging the battery from 110 volt to 270 volts 50 Hz AC mains along with DC charging facility from 12 volt to 48 volt DC ( on entire range ) should be provided. It should have "charge on" and "charge complete" indications during the charging of battery. The charger should be capable to charge the battery fully in <math>\leq 5</math> hours.</p>	<p>To be physically checked by the BOO</p> <p>Switch 'ON' the charger on 50 Hz variable AC mains supply and check the out-put voltage by varying the in-put voltage from 110 to 270 volts.</p> <p>Again switch 'ON' the charger on variable DC power supply and check the out-put voltage by varying the in-put voltage from 12 to 48 volts.</p> <p>Check the charger for 'Charge ON' and charge complete indications.</p> <p>Charge a fully discharged battery with the charger and note down the total time to fully charge the battery.</p>	<p>system must be equipped with battery Charger with all parameters as specified in para 14 (iv).</p>
15.	<b>Miscellaneous :-</b>		
	1. User Manual	Physically checked by the BOO.	User manual must be provided.

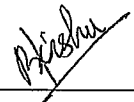
	2. Operation Manual/technical Manual - Detailed operators instructions, Technical literature, Maintenance manual, inspection standards be provided with the equipment	Physically checked by the BOO.	Operation Manual/technical Manual - Detailed operators instructions, Technical literature, Maintenance manual and inspection standards must be provided with the equipment.
	3. All the optional modules i.e. day camera, LRF, GPS, DMC, whichever specified by the user department, should be provide in a single housing	Physically checked by the BOO.	All optional module i.e. day camera, LRF, GPS, DMC, whichever specified by the user department must be provide in a single housing.
	4. Engineering support : a) Adequate number of spares including IR Sensor, Modules used (10% of total Nos of EO Sensors) etc. b) Test Station with Test Equipment for repair & maintenance of the system (Base workshop level). c) HHTI (Hand Held ) should be upgradable to be made part of CIBMS, if need be. d) OEM to submit rate list of all spare parts along with their blue print.	An undertaking in this regard will be obtained from the firm.	Engineering support as para 15 (4) (a to d ) must be provided .
16.	<b>Training :</b>		
	a) Base Workshop level training to minimum 10 technicians at OEM premises on full fledged running testing, diagnostic and calibration set up.	An undertaking in this regard will be obtained from the firm.	

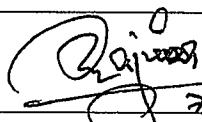
A collection of handwritten signatures and initials in black ink, including names like 'Anupam', 'Ramesh', 'Ramesh', 'Ramesh', 'Ramesh', 'Ramesh', and 'Ramesh'.

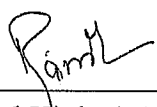
b) Operator level training should be imparted to 02 persons @ each system.	An undertaking in this regard will be obtained from the firm	Training as specified must be provided.
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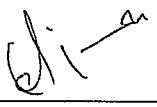
  
 (Ashok Kumar Sharma)  
 ADG (Log) BSF


  
 (Dhananjay Mishra),  
 Comdt, SIW BSF


  
 (Brij Kishor)  
 Sc 'E', DRDO

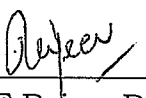
  
 (Rajnish Kumar), PSO (E)  
 BPR&D

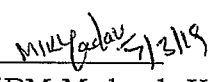
  
 (Rampal Yadav), DC  
 ITBP

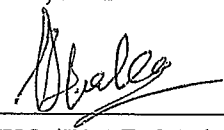
  
 (Suresh Kumar), Sqn Cdr  
 52 SAG, NSG


  
 (A P Singh), DC  
 SIW, BSF

  
 (Naresh Kumar), Dy. Director  
 DCPW

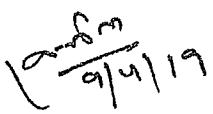
  
 (Insp/E Rajeev Dahiya),  
 CISF

  
 (ASI/RM Mukesh Kr Yadav)  
 BSF

  
 (WO/RM R S Dhaka)  
 Assam Rifle

  
 (Nb/Sub Bahadur Chand)  
 Assam Rifle

APPROVED/ NOT APPROVED

  
 9/4/19

(Rajni Kant Mishra) IPS  
 DIRECTOR GENERAL  
 BORDER SECURITY FORCE

**REVISED QRS/TDS OF HAND HELD THERMAL IMAGER (UN-COOLED VERSION)**

S. No.	Specification	Procedure suggested for trial for BOO	Result expected/desired
1.	<p><b>GENERAL DESCRIPTION:</b></p> <p>a) Be binocular / biocular (For long range version) &amp; Monocular (For short range version)</p> <p>b) Have capability to produce real time picture.</p> <p>c) Should be rugged for operations as per JS55555 or 810 F MIL and IP 65 or better.</p> <p>d) Should have a ruggedized customized container for transportation and a soft carrying case for dust and rain protection.</p> <p>e) Penetrate darkness, haze and smoke.</p>	<p>To be physically checked by the BOO for binocular/ biocular.</p> <p>To be physically checked by BOO on Eye Piece as well as on external device.</p> <p>Firm has to submit National /International accredited Lab certificate. If no such lab available in India then , firm has to submit any Indian Govt Lab/OEM certificate in respect of the same.</p> <p>To be physically checked by the BOO. Transportation case placed at a height of minimum 2 mtr with HHTI inside and drop on a hard surface. Transportation case should not be deformed and have any crack. Eqpt should work properly.</p> <p>Switch on the system in different conditions like full dark night, haze and smoke and observe the image on external LCD/LED screen. For creating the smoke condition BOO</p>	<p>HHTI must be binocular / biocular (For long range version) &amp; Monocular (For short range version)</p> <p>It must produce real time picture.</p> <p>System must be rugged for operations as per JS55555 or 810 F MIL and IP 65 or better.</p> <p>Transportation case should not be deformed and have any crack. Eqpt should work properly. Soft carrying case for dust and rain protection must be provided.</p> <p>HHTI must be capable to see through darkness, haze and smoke .</p>

A series of handwritten signatures and initials are present at the bottom of the page. From left to right, they include: a signature that appears to be 'Anand', another signature, a signature with '2018' written below it, a signature with '2018' written below it, a signature with '2018' written below it, a signature with '2018' written below it, a signature with '2018' written below it, and a signature with '2018' written below it.



		should use smoke candles. Sensor should work in all condition.	
f) Not get damaged if faced towards sun accidentally.	Switch on the system and direct towards the sun for 2 to 3 second. After this system should work properly.	It must not get damaged if faced towards sun accidentally.	
g) Be immune to glare of searchlights.	Switch on the searchlight and throw its beam towards HHTI in operational mode for 2 to 3 sec. After this system should work properly.	It must be immune to glare of searchlights.	
h) Have a suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision. It is not required in CIBMS compliant version.	To be physically checked by the BOO	It must have suitable tint to reduce eyestrain. This feature should help the observer to quickly regain his normal vision.	
i) <b>Weight</b> 1 Kg or less with Battery : HHTI uncooled (Short Range).	To be physically checked by the BOO.	Weight of the system must be 1 Kg or less with Battery.	
j) i) Weight 1.8 Kg or less with battery only for manual focusing (To be specified by the user department ) ii) 2.5 Kg or less with battery for Automatic & manual focusing facility (To be specified by the user department ) <del>Long range both</del>	To be physically checked by the BOO	i) Weight of the system must be 1.8 Kg or less with Battery. ii) Weight of the system must be 2.5 Kg or less with Battery.	
k) <b>Weight</b> 3.5 Kg without battery : HHTI (long range) compatible with CIBMS including optional requirements i.e Day Camera, LRF, GPS and DMC.	To be physically checked by the BOO	Weight of the system must be 3.5 Kg without battery for HHTI (long range) compatible with CIBMS including optional requirements i.e Day Camera, LRF, GPS and DMC.	

*Arif Ayfer*

*Shawab*  
07/11/19.

*Qasim*

*Mishan*

*Off*

*Para*

	l) Should be able to be fixed on Tripod, pole, tower and mast. (To be specified by the user at the time of tender).	To be physically checked by the BOO. An undertaking in this regard should also be obtained from the firm.	It must be able to be fixed on Tripod, pole, tower and mast. (To be specified by the user at the time of tender).
	m) Provision for switch ON/OFF of internal display (Eye piece assembly) through console unit of HHTI as well as C2 (as a part of CIBMS - to be specified by the user department). Optional feature for CIBMS compliant system	To be physically checked by the BOO.	It must have Provision for switch ON/OFF of internal display (Eye piece assembly) through console unit of HHTI as well as C2 (as a part of CIBMS - to be specified by the user department).
	n) All keys and controls should be provided on top of the HHTI and also through IP network to C2 console for CIBMS compliant version.	To be physically checked by the BOO.	All keys and controls must be provided on top of the HHTI and also through IP network to C2 console for CIBMS compliant version.
	o) Provide real-time pixel level sensor fusion between TI & day camera (Optional - To be specified by the user at the time of tender)	To be physically checked by the BOO.	It must have real-time pixel level sensor fusion between TI & day camera.
2.	<b>TECHNICAL SPECIFICATION:</b>		
	a) FPA resolution 640 x 480 or better.	Firm should submit OEM certificate supporting the specified parameters.	It must have FPA resolution 640 x 480 or better.
	b) Spectral range : 0.9 -2.5 µm / 3 – 5 µm/8 – 12 µm. (To be specified by the user at the time of tender)	Firm should submit OEM certificate supporting the specified parameters	It must have Spectral range : 0.9 -2.5 µm / 3 – 5 µm/8 – 12 µm.
	c) <b>Field of view :</b>  Wide : 8° x 6° (minimum)	Fix the equipment on ATS (Acceptance Test Station) and observe the TI image only and	FOV limits of the system must be as mentioned in the QRs Para 2 (c).

	<p>Narrow : <math>4^{\circ} \times 3^{\circ}</math> (maximum)          (Note: Field of view should be achieved optically only.)          Dual field of view is only applicable for long range version.          For short range version, field of view : <math>8^{\circ} \times 6^{\circ}</math> (maximum)</p>	<p>measure both field of view in degrees in horizontal and vertical and note down the reading. In addition firm should submit OEM certificate supporting the specified parameters.</p>	
	<p>d) Magnification :          Optical Zoom : 2x (min)  <b>(Only for Long range Version)</b>          Digital Zoom : 4x or better</p>	<p>Check the optical zoom of the system in the lab and also check the digital zoom as per procedure.</p>	<p>Magnification limits of the system must be as mentioned in the QRs Para 2 (d).</p>
	<p>e) HHTI should have ON /OFF (Mechanical) switch for operating.          Ready time from power off mode : 1 minute or less</p>	<p>The equipment will be switched ON from OFF mode to operational mode. The BOO will physically check this parameter by using stop watch.</p>	<p>It must have ON /OFF (Mechanical) switch for operating and must take <math>\leq 1</math> minute from 'OFF' mode to 'OPERATION' mode i.e ready time.</p>
	<p>f) Reticule for range estimation : in built</p>	<p>Switch ON the system and check for the "in built" system for range estimation.</p>	<p>It must have inbuilt reticule for range estimation.</p>
	<p>g) <b>Manual focusing facility for Long Range as well as Short range version .</b></p>	<p>To be physically checked by the BOO The system should be autofocus in both FOV when the user change the field of view as well as manually focus on particular targets.</p>	<p>There must be facility of manual focusing for long range as well short range version.</p>
	<p>h) Non Uniformity Calibration (NUC).</p>	<p>To be physically checked by the BOO for NUC facility.</p>	<p>It must have NUC.</p>

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	i) Polarity (black Hot and white Hot)	To be physically checked by the BOO	It must have Polarity (black Hot and white Hot).
	j) It should have provision for external video output (PAL) through BNC connector for hand held (Short range and long range) version.	To be physically checked by the BOO.	There must be a provision for connecting HHTI with external video monitor through BNC connector.
	k) Warranty on IR Sensor should be 04 years or 10000 working hrs whichever is earlier.	Check the undertaking certificate submitted by the firm regarding warranty on the IR Sensor.	Warranty of IR sensor must not less than 04 years or 10000 working hrs, whichever is earlier.
3.	<b>Operational</b>		
	<p><b>(a) Short Range version</b></p> <p><b>(i) Human</b>            Detection : 500 Mtr</p> <p>Recognition : 300 Mtr</p>	<p><b>Detection :</b></p> <p>Place one Jawan in camouflage uniform at the range of 500 Meters and move the both hand up &amp; down. Then move the jawan horizontally with the same action. Movement of hand should be detected.</p> <p>Detection means :- ability to detect vehicles , structures (man made /normal) and any movement of man or animal.</p> <p><b>Recognition :</b></p> <p>Move a group of 03 persons in camouflage uniform from a range of 300 Mtrs and move the both hand</p>	<p>Human target detection and recognition through HHTI must be achieved as per para-3(a).</p>

A series of handwritten signatures and initials are located at the bottom of the page. From left to right, they include: a signature that appears to be 'S. S. S.', another signature, a signature with '02/11/19' written below it, a signature with '20' written below it, a signature with 'di' written below it, a signature with 'Ajish' written below it, a signature with 'G. S.' written below it, a signature with 'mugah' written below it, a signature with 'N. S.' written below it, and a signature with 'Tam' written below it.

	<p>up &amp; down. Then move the jawan horizontally with the same action. The movement of hands be recognized.</p> <p>Recognition :- Ability to differentiate between civilian/uniformed personnel with manpack</p>	
<p><b>ii) Vehicle :</b> Detection :1250 Mtr</p> <p>A vehicle of maximum overall length of 4010 mm, maximum overall width of 1540 mm and maximum overall height of 1875 mm.</p>	<p><b>Detection :</b> Test the vehicle of given dimensions , moving and stationary at different angles, at a distance of 1250 meters for detection.</p>	<p>Vehicle detection through HHTI must be achieved as per para-3(b).</p>
<p><b>b) Long Range version</b></p> <p>i) <b>Human</b></p> <p>Detection: 1 Km. Recognition :600 Mtrs.</p>	<p><b>Detection :</b> Move a group of 03 persons at a distance of 1 Km. HHTI should detect the movement.</p> <p><b>Recognition :</b> Move a group of 03 persons in camouflage uniform from a range of 750 Mtrs with both hand up &amp; down movement towards the HHTI. The movement of person with both hand up &amp; down be recognized at a range of 600-Mtrs.</p>	<p>Human target detection, and recognition through HHTI must be achieved as per para-3(b).</p>
<p>ii) <b>Vehicle :</b> Detection : 2 Km. Recognition : 1 Km.</p>	<p><b>Detection :</b> Test the vehicle of given dimensions, moving and stationary at different angles at a distance of 2 Kms for</p>	<p>Vehicle detection and recognition through HHTI must be achieved as per para-3(b) ii.</p>

Anand Arjun, [Signature], [Signature], [Signature], [Signature], [Signature], [Signature]

	(A vehicle of maximum overall length of 4010 mm, maximum overall width of 1540 mm and maximum overall height of 1875 mm.)	detection. If not detected mention the distance at which detection is achieved.  <b>Recognition :</b> Test the vehicle of given dimensions, moving and stationary at different angles, at a distance of 1 Km for recognition . Recognition means type of vehicle.	
4.	<b>1) DAY CAMERA : (Optional- to be specified by the user department)</b>		
a. Colour Camera	Put the HHTI in normal mode so that only day camera image is displayed on the screen.	Must be Colour Camera.	
b. Resolution : 754 X 576 (Min) .	Firm has to submit National /International accredited Lab certificate . If no such lab available in India then , firm has to submit any Indian Govt Lab /OEM certificate in respect of the same .	Resolution must be 754 X 576 (Min) or better.	
c. Digital Zoom : 4x or better	Check the optical zoom physically in the lab as per the procedure.	Digital zoom must be 4x or better.	
d. Optical Zoom : 5x or better (Continuous)	To be physically check by the BOO.	Optical Zoom must be 5x Continuous or better.	
e. Auto Focus/ Manual	Check the focusing mechanism provided for automatic and manual focusing	System must be Auto /Manual Focus.	
<b>2) Range :</b>			

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<b>Day Camera :</b>		
<b>a) Range for human target</b>		
Detection : 3 Km or better	<b>Detection :</b> Move a group of 03 persons at a distance of 3 Km. Day camera should detect the movement.	Detection, recognition and identification target must be achieved as per para-4 (2) (a).
Recognition : 1.5 Km or better	<b>Recognition:</b> Move a group of 03 persons at a distance of 1.5 Km. Day camera should detect the Nos of persons, man or women and person with or without weapon.	
Identification : 750 Mtrs or better	<b>Identification:</b> Move a group of 03 persons with weapon at a distance of 750 Mtrs. Day camera should identify the presence of men with weapon and colour of the dress.	
<b>b) Range for Vehicle</b>		
Detection : 4 Km or better	<b>Detection:</b> Place medium vehicle at distance of 4 Km. Day camera should detect the presence of stationary & moving vehicle	Vehicle detection, recognition and identification through Day Camera must be achieved as per para-4 (2) (b).
Recognition : 2 Km or better	<b>Recognition:</b> Place medium vehicle at a distance of 2 Km. Day camera should recognize the type of vehicle / loaded or not.	
Identification: 1 Km or better	<b>Identification:</b> Place medium vehicle at a distance of 1 Km. Day camera should identify type of vehicle with colour.	
5.	<b>EYE PIECE ASSEMBLY (for Hand held version only)</b>	
	<b>(A) HHTI (Used as Handheld or on tripod)</b>	

*General Officer*  
*Sharma*  
*Qs*  
*Di*  
*Mishra*  
*Off*  
*Mukherjee*  
*Man*  
*Pam*  
*[Signature]*

	a) Inter Pupillary Distance (IPD) : Adjustable <b>Note :- Only for long range version.</b>	To be physically checked by the BOO	System must have adjustable Inter Pupillary Distance (IPD).
	b) Internal display : Advance high resolution OLED display having resolution 640 x 480 or better	Firm has to submit National /International accredited Lab certificate . If no such lab available in India then , Firm has to submit any Govt Lab in India /OEM certificate in respect of the same.	System must have advance high resolution OLED Internal display of resolution 640 x 480 or better.
<b>(B) HHTI TO BE INTEGRATED WITH CIBMS</b>			
	Eye Piece assembly and internal display are not required.	To be physically checked by the BOO	Not required.
6.	<b>Operating temp Range :</b> a) -20 degree to +55 degree centigrade.	Check the National/International Accredited lab certificate/report submitted by the firm in respect of operating Temp. BOO will also physically check in different climatic condition in the field (i.e. cold as well as hot)	The firm should provide National/International Accredited lab certificate/report in respect of temperature range of para 6 (a) & (b) . In case any doubt in the test report , the veracity of the same may be checked from the concerned lab. System must work in different climatic condition in the field (i.e cold as well as hot ).
	b) <b>Storage temp Range:</b> -30 degree to +60 degree centigrade.	Check the National/International Accredited lab certificate/report submitted by the firm in respect of operating Temp.	
7	<b>Network Connectivity : (Optional - to be specified by the user department)</b>		
	a) Ability to integrate with available IP Network through LAN with video streaming and Video recording.	To be physically checked by BOO for integration with available IP Network through LAN with Video streaming & Video recording.	Must be able to integrate with available IP network through Ethernet with Video streaming and Video recording.



	b) Firm should be able to integrate HHTI with third party C2. Firm should also be able to provide SDK /API and interface protocol for integration with third party C2.	To be physically checked by BOO for integration with third party C2.	System must be able to integrate with third party C2. Firm should also be able to provide SDK /API and interface protocol for integration with third party C2.
8.	<b>OPERATOR CONSOLE UNIT : (Optional to be specified by the user department)</b>		
	a. This must be comprising of a ruggedized LCD colour display of size 15 inch (min).	To be physically check by the BOO. Firm has to submit national / international accredited lab certificate / report in respect of ruggedized LCD display.	System must be comprising of a ruggedized LCD color display of size 15 inch (min).
	b. The console unit should have the facility to show the map in the background correlated with the video of the camera. (In case system is provided with the GPS).	Check the correlation between captured video with background map by uploading the map in Console unit.	The console unit must have the facility to show the map in the background correlated with the video of the camera. (In case system is provided with the GPS).
	c. A suitable provision of the control keys or joystick should be provided to operate the system remotely with comfort.	Install the HHTI with console and check the system functions through console remotely.	A suitable provision of the control keys or joystick should be provided to operate the system remotely with comfort.
	d. The console should have recovery option in the system itself whenever software gets corrupted.	Check the console for the provision of system recovery facility and also check the assurance certificate in respect of the same	The console must have recovery option in the system itself whenever software gets corrupted.
	e. The console should have the provision to control the	Repeat the procedure suggested at para (8C) and check the function of	The console must have the provision to control the operation of day & night camera and Pan & Tilt

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	operation of day & night camera and Pan & Tilt system.	cameras and Pan & Tilt sub system	system.
	f. The console should have scan around facility and automatically scan the operator defined sector whenever required. (In case system has integrated with DMC).	Check the system for automatic scan around facility.	The console must have scan around facility and automatically scan the operator defined sector whenever required. (In case system has integrated with DMC).
	g. The console must incorporate built in test equipment (BITE)	Check the system for BITE facility physically.	The console must have built in test equipment (BITE).
	h. Should have ports for external PC interface, LAN and digital & analogue video out.	Check the system for external PC interface, LAN and digital & analogue video output ports.	System must have ports for external PC interface, LAN and digital & analogue video out.
	i) Console should have suitable power adaptor.	To be physically checked by BOO.	Suitable power adaptor must be provided.
	j)Video Recording Capability: Advanced inbuilt storage memory of 1TB (min) exclusively to store the video should be provided in the console. The system should have facility to retrieve the stored data.	Check the inbuilt storage memory exclusively to store the video in the console. Check the console for facility to retrieve the storage data.	Video Recording Capability: Advanced inbuilt storage memory of 1TB (min) exclusively to store the video must be provided in the console. The system must have facility to retrieve the stored data.
9.	<b>PAN &amp; TILT MECHANISM : (Optional- to be specified by the user department)</b>		
	High precision motorized pan and tilt unit with variable speed facility.	Physically check the Pan & Tilt mechanism for variable speed facility precisely through console	System must have PAN & TILT mechanism as per para 9(a)&(b).

Sanj Ayaz, Khuram, Qasim, Adishan, Muzam, Nam, Ram

	a) Azimuth (Pan) for 360° with variable speed of 1° to 40°/Sec.	Check the azimuth movement for 360° with variable speed of 1° to 40°/Sec	
	b) Elevation (Tilt) for +25° (Min) & -45° (Min) with variable speed of 1° to 15°/Sec.	Check the Elevation (Tilt) movement for +25° (Min) & -45° (Min) with variable speed of 1° to 15°/Sec.	
10.	<b>Remote Surveillance Facility : (Optional- to be specified by the user department)</b>		
	a) Console should be able to operate and control the equipment <b>through wire</b> (100 meters minimum).	Install the HHTI & console with wire remotely and distance between them should be 100 meters minimum. Check the operation of HHTI through console.	
	b) To stream imagery <b>over wireless link</b> (500 meters minimum NLOS and 3000 meters minimum LOS with encryption) and control all functions.	Install the wireless transmitter at HHTI end and receive the video at 3000 meters away from it or as mentioned by the user at the time of indent, in LOS to HHTI. Again receive the video at 500 meters away in NLOS to HHTI i.e. behind a mountain or obstacles.	System must have provided with remote surveillance facility as per para 10(a) & (b).

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11.	<b>Digital Magnetic Compass (DMC) : (Optional- to be specified by the user department)</b>		
Inbuilt DMC should be provided for auto Northing.  Accuracy should be $\leq 1^\circ$ .	Switch 'ON' the HHTI and do auto northing. Note down the bearing of a point with the help of compass. Again check the bearing of that point through inbuilt DMC and then compare both the readings for accuracy.	Inbuilt DMC must be provided.	
12.	<b>Global Positioning System (GPS) : (Optional- to be specified by the user department)</b>		
Inbuilt GPS to provide own position during initialization. It should give co-ordinates in Lat-Lon and Indian Military GR system. Accuracy should be 5 meters (Max).	Switch 'ON' the HHTI and co-ordinates of own position through inbuilt GPS.  Check the own position co-ordinates of a point by other GPS and compare it with the co-ordinates of the same point shown by the inbuilt GPS.	Inbuilt GPS to provide own position during initialization. It should give co-ordinates in Lat-Long and Indian Military GR system. Accuracy should be 05 meters (Max).	
13.	<b>In built Laser Range Finder : (Optional- to be specified by the user department)</b>		
In built LRF (class 1 eye safe) should be provided for finding range of any target/object upto 4000 meters or better with accuracy of $\pm 5$ Mtrs or better.	To be physically checked by BOO. Firm has to submit National /International accredited Lab certificate. If no such lab available in India then , firm has to submit any Indian Govt Lab/OEM certificate	In built LRF (class 1 eye safe) must be provided for finding range of any target/object upto 4000 meters or better with accuracy of $\pm 5$ Mtrs or better.	

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		in respect of class 1 eye safe.	
14.	<b>POWER SOURCE:</b> It should Function on 110 volt to 270 v, 50 Hz AC mains through AC/DC Adopter or UPS with Stabilizer. Battery back up of UPS minimum 30 Minutes.	Connect the AC/DC adopter on 50 Hz variable AC mains supply and check the out-put voltage by varying the in-put voltage from 110 to 270 volts.  Battery backup of UPS 30 Minutes to be checked physically.	It must function on 110 volt to 270 volt, 50 Hz AC mains through AC/DC Adopter or UPS with Stabilizer. UPS backup with 30 Minutes only for CIBMS compliant system .
<b>FOR HHTI IN HAND HELD ROLE ONLY :-</b>			
	<b>(ii) Battery :</b>  Should have rechargeable commercially available Lithium-ion/Lithium polymer battery or better to operate the system. Battery charge indication should be on screen.	To be physically checked by the BOO.	The system must be operated with rechargeable commercially available Lithium-ion/Lithium polymer battery. Battery charge indication must be provided on screen.
	<b>(ii) Battery performance :</b>  The battery(s) should be able to run the system for 4 hours or more in operation mode on single charge.	To be physically checked by the BOO.	Rechargeable battery(s) must run the system for 4 hrs or more in operational mode on single charge.
	<b>(iii) Spare batteries :</b>  For additional cycle of operation,	Undertaking be given by the firm.	System must be provided with 3 spare batteries.

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	<p>03 spare batteries be provided.</p> <p><b>(iv) Battery charger :</b></p> <p>A smart and intelligent, universal charger for charging the battery from 110 volt to 270 volts 50 Hz AC mains along with DC charging facility from 12 volt to 48 volt DC (on entire range) should be provided. It should have "charge on" and "charge complete" indications during the charging of battery. The charger should be capable to charge the battery fully in <math>\leq 5</math> hours.</p>	<p>To be physically checked by the BOO</p> <p>Switch 'ON' the charger on 50 Hz variable AC mains supply and check the out-put voltage by varying the input voltage from 110 to 270 volts.</p> <p>Again switch 'ON' the charger on variable DC power supply and check the out-put voltage by varying the input voltage from 12 to 48 volts. Check the charger for 'Charge ON' and charge complete indications. Charge a fully discharged battery with the charger and note down the total time to fully charge the battery.</p>	<p>System must be equipped with battery charger with all parameters as specified in para 14(iv).</p>
15.	<b>Miscellaneous :-</b>		
	1. User Manual	Physically checked by the BOO.	User manual must be provided.
	2. Operation Manual/technical Manual - Detailed operators instructions, Technical literature, Maintenance manual, inspection standards be provided with the equipment	Physically checked by the BOO.	Operation Manual/technical Manual - Detailed operators instructions, Technical literature, Maintenance manual, inspection standards must be provided with the equipment.

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<p>3. All the optional modules i.e. day camera, LRF, GPS, DMC, whichever specified by the user department, should be provide in a single housing</p>	<p>Physically checked by the BOO.</p>	<p>All optional module i.e. day camera, LRF, GPS, DMC, whichever specified by the user department must be provide in a single housing.</p>
<p>4. Engineering support :</p> <p>a) Adequate number of spares including IR Sensor, Modules used (10% of total Nos of EO Sensors) etc.</p> <p>b) Test Station with Test Equipment for repair &amp; maintenance of the system (Base workshop level).</p> <p>c) HHTI should be upgradable as a part of CIBMS.</p> <p>d) OEM to submit rate list of all spare parts along with their blue print.</p>	<p>An undertaking in this regard will be obtained from the firm.</p>	<p>Engineering support as per para 15(4) (a) to (d) must be provided.</p>
<p>16. <b>Training :</b></p> <p>a) Base Workshop level training to minimum 10 technicians at OEM premises on full fledged running testing, diagnostic and calibration set up.</p>	<p>An undertaking in this regard will be obtained from the firm.</p>	<p>Training as specified must be provided.</p>

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b) Operator level training should be imparted to 02 persons @ each system.	An undertaking in this regard will be obtained from the firm.	Training as specified must be provided.
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(Brij Kishor)  
Sc 'E', DRDO

(Rajnish Kumar), PSO (E)  
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(Naresh Kumar), Dy. Director  
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(Insp/E Rajeev Dahiya),  
CISF

(ASI/RM Mukesh Kr Yadav)  
BSF

(WO/RM R S Dhaka)  
Assam Rifle

(Nb/Sub Bahadur Chand)  
Assam Rifle

**APPROVED/ NOT-APPROVED**

(Rajni Kant Mishra) IPS  
DIRECTOR GENERAL  
BORDER SECURITY FORCE