

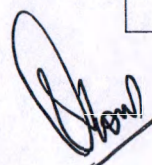
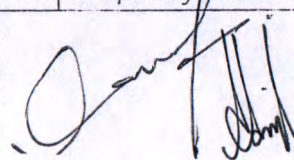
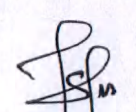
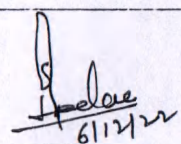
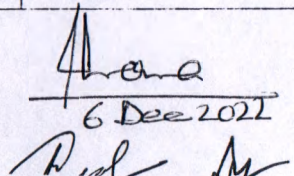
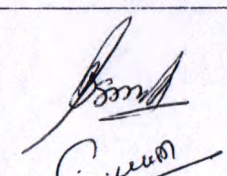
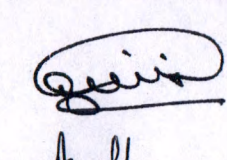
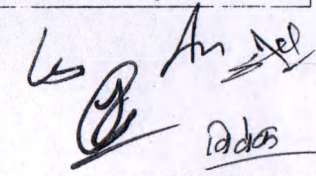
### Appendix-‘A’

## QRs and Trial Directives of Anti Drone Gun

S/No	Technical Specification	Procedure suggested for trial	Result expected/desired
A	GENERAL PARAMETERS		
1.	Anti-Drone Gun should be Hand Held/Backpack or combination of both as well as mountable on tripod, easily transportable and operable in day and night environment. The System should be easily deployable, designed for one hand/two hand operation.	To be physically checked by the BOO for its feasibility for Hand Held/Backpack or combination of both, mounted on tripod, easy to carry and operate in day and night environment.	The System must as per Specification mentioned in QRs.
2.	Weight: Category 1: $\leq 10$ Kgs for 02 Km (minimum jamming range) including backpack Category 2: $\leq 06$ Kgs for 01 Km (minimum jamming range)	Measure the weight of the system with the help of weighting machine.	Weight of the system must as mentioned in the QRs.
3.	The system should be able to cut off communication between the target UAS and the remote controller by jamming data links as mentioned at Srl No.18.	To be physically checked by the BOO.	The System as per the requirement mentioned in the QRs.
4.	The system should be able to Jam the all-operating GNSS/standard remote-control Frequency of the UAS as mentioned at Srl No.18.	To be physically checked by the BOO.	The System as per the requirement mentioned in the QRs.
5.	The system should be capable to neutralize the UAS (like Copters, Fixed wing UAVs and Radio-Controlled UAVs etc) in different categories in specified range of Radio Frequency spectrum.	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.

*[Handwritten signatures and dates]*

S/No	Technical Specification	Procedure suggested for trial	Result expected/desired
6.	The system should be effective on all available UAS operating in all frequency bands mentioned at Srl No. 18.	The firm has to submit OEM certificate in confirmation to the parameter.	The System must as per the requirement mentioned in the QRs.
7.	The system should be able to control disruption on multiple RF frequency bands (as mentioned srl No.18) simultaneously.	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.
8.	The system should be provided with radio frequency status indicator.	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.
9.	The system should provide a safe passive countermeasure against a wide range of UAS models.	OEM to provide safety certificate against harmful radiation for the User.	The System must as per the requirement mentioned in the QRs.
10.	When disruption is triggered, UAS will either come down or stay stand still or follow return path.	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.
11.	Once RF disruption get activated, system should immediately cease video transmission back to the UAS operator. (If the module for telemetry & Radio link is same)	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.
12.	The system should feature an intuitive control panel user interface to select and engage of jamming frequencies for target defeat.	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.
13.	The system should have featured a robust compact design with a control panel user interface, allowing operators to select and engage RF disruption frequency modes.	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.

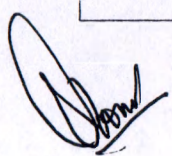
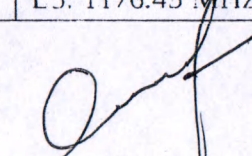

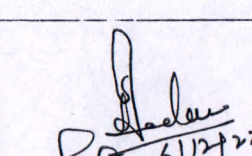
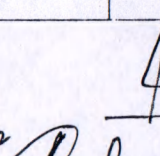
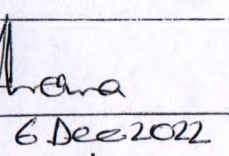
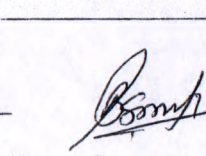
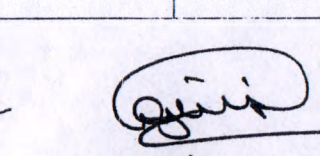
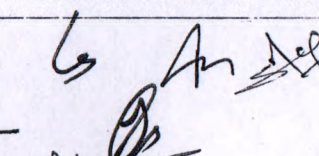









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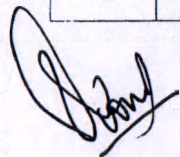
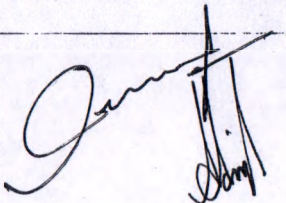
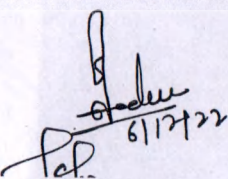
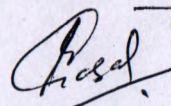
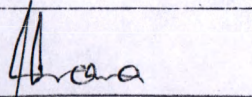
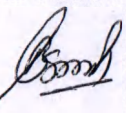
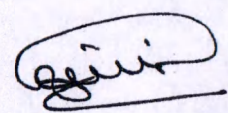
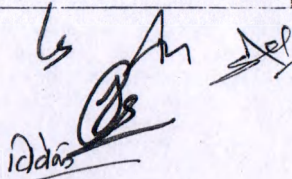
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S/No	Technical Specification	Procedure suggested for trial	Result expected/desired
14.	The system should have voice guidance/prompt on triggering jamming operation. The system should also have the option to mute the audio prompt if required.	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.
B.	OPERATIONAL CAPABILITY		
15.	Neutralized/Jamming range:- capable to neutralize the UAS or group of UAS (Swarm attack) from a distance of 01 Km (Min) and 02 Km (Min) depending on the category of System.	To be physically checked by the BOO by activating the UAS or multiple UAS (minimum four UAS in different directions) from the specified ranges at unknown locations. UAS distance v/s jammer should be maintained in the ratio of 1:2 or better.	The System must as per the requirement mentioned in the QRs.
16.	Cone of the jamming- 30° or more	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.
17.	Neutralization Time- Capable to neutralize the UAS by jamming its radio and GNSS links at its place of operation within 10 seconds after pressing of jamming system.	To be physically checked by the BOO by operating one UAS at the specified distance.	The System must as per the requirement mentioned in the QRs.
18.	Neutralization Frequency- The system should be capable to simultaneously disrupt all typical UAS Operating Bands of: 433.05-434.79 MHz 902-928 MHz 2.4000-2.4835 GHz 5.725-5.875 GHz and GNSS frequency bands of: L1: 1575.42 - 1609.3125 MHz L2: 1227.06-1251.6875 MHz L5: 1176.45 MHz	The BOO will also verify that the video link got jammed during the time through GCS display. Operating band will checked by the spectrum analyzer. The OEM should provide certificate in respect of upgrading the system to frequency between 20 MHz to 8 GHz.	The System must as per the requirement mentioned in the QRs.

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S/No	Technical Specification	Procedure suggested for trial	Result expected/desired
	<p>Frequencies may be selected out of above frequencies as per user requirement or additionally added any other frequency for specific user requirement. [ Like 1561.098 Beidou (B-1)/ 850-870 MHz]</p> <p>In addition to above the system should have capabilities of jamming and to:-</p> <p>Jam the UAS which are operating with integrated conn link (i.e. video link and RC link 2.4 GHz band) in FHSS technology.</p>		
19.	The system should operate in autonomous operation (continuous jamming) for at least 01 Hour in case of backpack and easily swappable batteries in case of handheld (Ensuring continuous jamming even while swapping of the batteries).	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.
20.	Ruggedized (Anti Drone Gun & its components) as per ISS 55555/Mil Std 810 H or better in respect of temperature (high & low), dust, humidity, rain impact, bump, drop and vibration tests.	The Firm should submit national/international accredited lab certificate/report in respect of the same.	The System must as per Specification mentioned in QRs.
21.	<p>Operating Temp: -20° C to +50° C</p> <p>Storage Temp: -30° C to +50° C</p> <p>OR</p> <p>Operating Temp:- 30° C to +50° C</p> <p>Storage Temp:- 30° C to +50° C</p> <p>(user may decide at the time of tender)</p>	The firm should submit national/international accredited lab certificate/report in respect of the same.	The System must as per the requirement mentioned in the QRs.

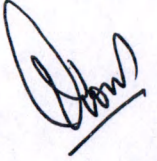

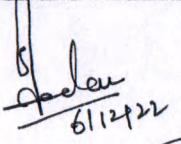
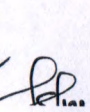
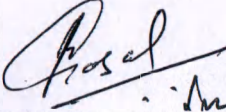
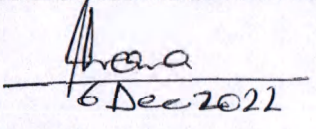
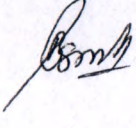
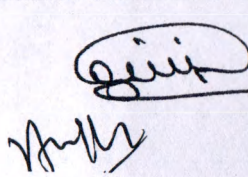
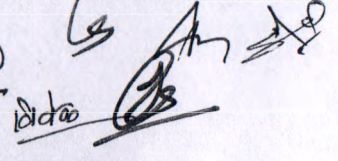
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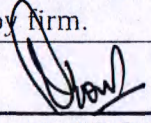
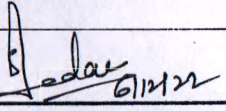
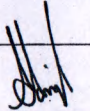
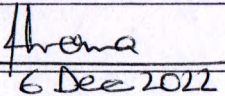
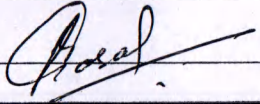
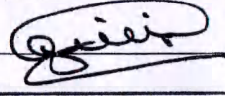

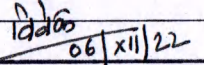
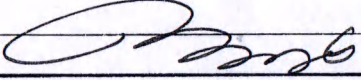
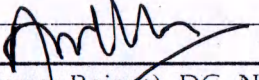
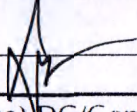
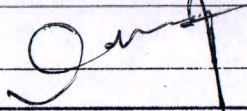
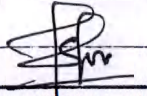
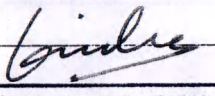
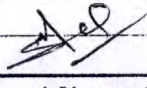
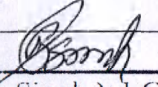
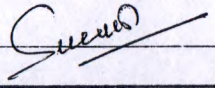
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S/No	Technical Specification	Procedure suggested for trial	Result expected/desired
22.	Life of equipment- 05 Years.	The OEM should submit undertaking in this regard.	The OEM should submit undertaking in this regard.
C	POWER SOURCE		
23.	The system should operate on Lithium based rechargeable battery.	To be physically checked by the BOO.	The System must as per the requirement mentioned in the QRs.
24.	Battery/backup:- i) Supplied batteries should have warranty of 03 years or 500 cycles (after 500 cycles battery should not be less than 70% of its original initial capacity) Batteries should have the backup of minimum 1 hour for continuous operation (Neutralization/Jamming).	To be physically checked by the BOO by verifying the certificate/warranty of OEM. The system should also be operating independently on battery backup for specified time.	The System must as per the requirement mentioned in the QRs.
25.	Suitable battery charger: ii) Suitable battery charger to work with in the range of AC (110 V to 270V, 50 Hz). charging time max 06 Hrs for fully charging of battery with full charge indication.	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 V to 270 Volts. Check the charger for 'Charger ON' and 'Charge complete' indications. Charge a fully discharged battery with charger and charge the battery within 06 Hrs.	The System must as per the requirement mentioned in the QRs.
D	MISCELLANEOUS:		
26.	Should have ruggedized IP 67 carrying cases to make eqpt safe against damage during transportation.	The firm submit the certification in this regard.	The System must as per the requirement mentioned in the QRs.
27.	Operating manual user/operator will be provided by firm.	To be physically checked by the BOO.	The requirement must provide by the OEM/Firms.
28.	Technical manual for minor repair/maintenance will be provided by firm.	To be physically checked by the BOO.	The requirement must provide by the OEM/Firms.
29.	List of spare parts (if any) for minor repair will be	To be physically checked by the BOO.	The requirement must provide by

  
  
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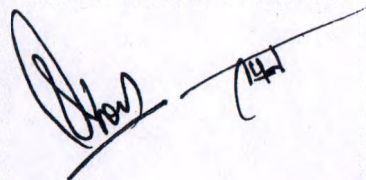
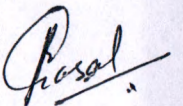
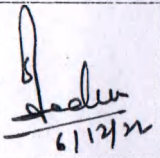
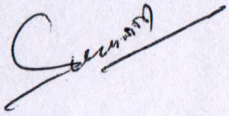
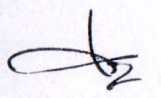
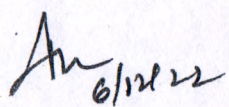

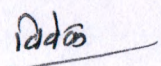
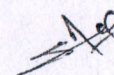
S/No	Technical Specification	Procedure suggested for trial	Result expected/desired
	provided by the firm.		the OEM/Firms.
30.	Tools for minor repair (if any) and maintenance will be provided by firm.	To be physically checked by the BOO.	The requirement must provide by the OEM/Firms.
	 (Pankaj Goomer), ADG (Log), BSF	 (S C Yadav), DIG(SIW) (Now IG), BSF	 (S S Rathore, Comdt (NIIE Cell) BSF
	 6 Dec 2022 (Happy Verma, Comdt Ord, BSF	 (Dr. M M Gosal), SSO, BPR&D	 (R. Yadagiri, Sc 'F', DLRL, DRDO, Hyderabad
	 (Jaspreet Singh), 2IC, ITBP	 06/xii/22 (Vivek Kumar Gupta), JAD, DCPW	 Sh Anoop Shukla, DC/AIA, BSF
	 (Anil Kumar Rajput), DC, NIIE Cell. BSF	 (Lalit Saxena), DC/Comn, CRPF	 (Vikrant Yadav), Sqn Cdr, NSG
	 (Kapil Kamdi), DC, CISF	 (Ph. K K Sharma, AC, SIW, BSF	 (Inspr/RM Ashwani Kumar), SIW, BSF
	 (Sub Balwan Singh), LO Assam Rifles	 (ASI/Comn Bhatt Shekhar), SSB	

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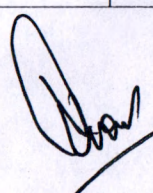
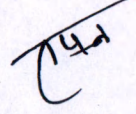
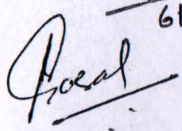
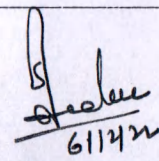
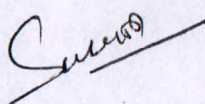
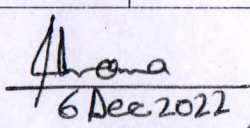
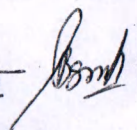
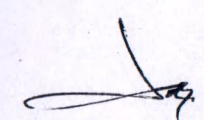
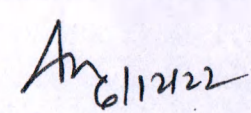

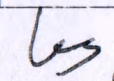
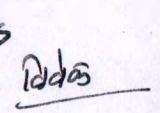
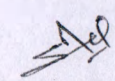
  
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QRs and TDs of Light Weight Lumen Torch Light

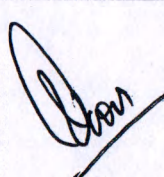
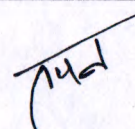
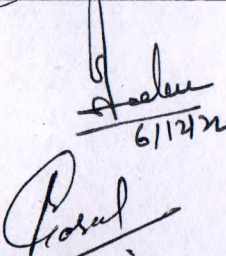
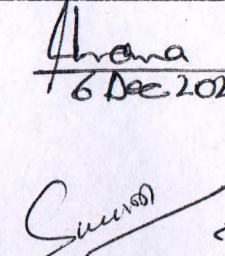
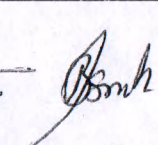
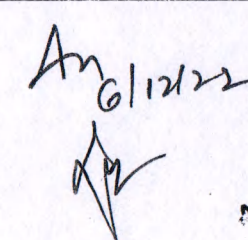
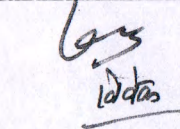

S No	Parameter	Specification	Procedure suggested for trial	Result expected / desired
1.	Body	Body should be tubular heavy duty:- a) Water Resistant b) Heat Resistant c) Shock Resistant d) Dust Resistant	Firm to submit Indian Govt. Institution / NABL Certificate for the same.	Body must be tubular heavy duty, water, heat, shock and dust resistant.
2.	Construction	a) Modular construction easy to operate by a trained soldier.	To be physically checked by the BOO.	Model of construction of torch light must be easy to operate.
		(b) Colour of the casing should be olive green or black.	To be physically checked by the BOO for its body colour.	Colour of the casing must be olive green or black.
		(c) Markers name and operational instructions in brief shall be printed on the casing of the body.	To be physically checked by the BOO.	Markers name and operational instructions must be printed on the casing of the body.
3.	Operating Temperature	Torch light shall be able to operate satisfactory in range temperature of $-20^{\circ}\text{C}$ to $+55^{\circ}\text{C}$ with 95% RH.	Firm has to submit any Indian Govt. Institution / NABL Certificate in respect of the same.	Firm must provide any Indian Govt. Institution / NABL Certificate in respect of the same.
4.	Lithium Battery with suitable charger	(a) Rechargeable lithium battery.	To be physically checked by BOO the type of battery used and its suitability with the LWHLTL physically and OEM to issue a standardized Certificate.	Rechargeable lithium battery of suitable size & shape suiting the design of the LWHLTL must be provided.
		(b) Charge time - 3 Hrs $\pm$ 1 Hrs, which makes it relatively easier and more probable to fully recharge.	To be physically checked by BOO.	Battery must be charged within 3 Hrs $\pm$ 1 Hrs, which makes it relatively easier and more probable to fully recharge.

S No	Parameter	Specification	Procedure suggested for trial	Result expected / desired
		(c) Discharge time - 5 Hrs $\pm$ 1 Hrs continuance use with full load.	To be physically checked by BOO by continuous operation of 5 hrs $\pm$ 1 hrs with full load.	Battery must be run for continuous operation of 5 hrs $\pm$ 1 hrs with full load.
		(d) Housing for the battery should be provided in the cabinet/casing of the Torch Light	To be physically checked by BOO by inserting the Battery in the cabinet/casing of the torch light.	Housing for the Battery must be provided in the cabinet/casing of the Torch Light.
		(e) The housing is such that the battery could be replaced easily.	To be physically checked by BOO by replacing the battery.	Housing must be easy to replace the battery.
		(f) Low battery indicator shall be provided.	To be physically checked by BOO by connecting through regulated power source by decreasing / increasing their Voltage.	Low battery indicator must be provided.
		(g) Input voltages 90 to 270 volts, 50 HZ single phase AC	To be physically checked by BOO by connecting the AC power through Rheostat /Dimmer. AC power supply Vary the Input from 90 Volt to 270 V. Check the out-put of the charger.	The out-put of the charger must not vary as the in-put varies from 90 volt to 270 volt.
		(h) Adequate protection shall be provided against short circuit and bty over charge.	To be physically checked by BOO against short circuit and battery over charging.	Adequate protection must be provided against short circuit and battery over charge.
		(j) Battery life - 1 Year (One year).	Check the Certificate in respect of operational life.	OEM must provide battery life Certificate or under taking in this regard.
5.	Wiring	Wiring should be neat and clean using minimum number of wires for ease of serviceability. Wire should be of heavy duty.	To be physically checked by the BOO.	Wiring must be neat and clean using minimum number of wires for ease of serviceability. Wire should be of heavy duty.

S No	Parameter	Specification	Procedure suggested for trial	Result expected / desired
6.	Switches/ Select	Suitable control for ON/OFF and function like flasher and dimmer.	To be physically checked by BOO.	Must be provided Suitable control for ON/OFF and function like flasher and dimmer.
7.	Beam distance/ Range of illumination	Torch Light should be able to detect a moving person at a distance of 300 Mtrs (Minimum).	Move group of 3 persons at the range of 300 meters (min) and move them horizontally and monitor the beam by person placed horizontally away from the beam source.	The group of 3 men must be detected from 300 meters (min).
8.	Beam Angle	7 to 11 degree	Firm has to submit any Indian Govt. Lab & OEM Certificate in respect of the same.	Beam Angle must be between 7 to 11 degree.
9.	Length	Upto 40 Cms	To be physically checked by BOO.	Length must be upto 40 Cms.
10.	Weight	700 Gram $\pm$ 100 Gram	To be physically checked by BOO.	Weight must be 700 Gram $\pm$ 100 Gram
11.	Diameter (head)	6 Cms to 7.5 Cms	To be physically checked by BOO.	Diameter (head) must be 6 Cms to 7.5 Cms
	Diameter (Body)	Upto 5 Cms	To be physically checked by BOO.	Diameter (Body) must be upto 5 Cms
12.	Light source.	LED based light source single or multiple	To be physically checked by BOO.	LED based light source single or multiple highly lumen.
13.	Reflector	Parabolic or better reflector mounted in shock resistance cap good quality rubber	To be physically checked by BOO.	Parabolic or better reflector must be shock resistant.
14.	Front Glass	The glass should be of good quality and should be heat and scratch resistant.	OEM to provide Certificate on the same.	The glass must be of good quality, heat and scratch resistant.
15.	Warranty	One year for Torch Light and Battery.	Check the Certificate in respect of Torch light and battery warranty.	OEM must provide Torch and battery life certificate.

S No	Parameter	Specification	Procedure suggested for trial	Result expected / desired
16.	Misc	User Manual should be provided with each Torch Light.	To be physically checked by BOO.	User Manual must be provided with torch light.

(Pankaj Goomer), ADG (Log), BSF

(S C Yadav), DIG(SIW) (Now IG), BSF

(Happy Verma), Comdt Ord, BSF

(Dr. M M Gosal), SSO, BPR&D

(Vivek Kumar Gupta), JAD, DCPW

(Anoop Shukla), DC/AIA, BSF

(Lalit Saxena), DC/Conn, CRPF

(Tapan Wadhwa), DC, CISF

(Vipin Kumar), AC-II, NSG

(Ph. K K Sharma), AC, SIW, BSF

(Inspr/RM Ashwani Kumar), SIW, BSF

(Inspr Jogender Lal), ITBP

(Sub Balwan Singh), LO Assam Rifles

(ASI/Conn Bhatt Shekhar), SSB

Approved / Not Approved

Director General  
Border Security Force