GOVERNMENT OF INDIA (Ministry of Home Affairs) DIRECTORATE GENERAL CENTRAL RESERVE POLICE FORCE EAST BLOCK-7, SEC-1, R.K. PURAM, NEW DELHI-110066

(Email:- comncell@crpf.gov.in Tele/Fax:011-26107493)

No. B.V-7/2020-21-C (QRs)

Dated, the 20 November'2020

То

- DIG (Comn), ITBP Block No. 2, CGO Complex Lodhi Road, New Delhi-03
- 3. DIG (Comn), SSB East Block-V, R.K Puram New- Delhi-66
- DIG (Prov), BSF
 Block No. 10, CGO Complex
 Lodhi Road, New Delhi-03

- 2. DIG (Comn), NSG Meharam Nagar Palam, New Delhi-37
- 4. AIG (Comn), CISF Block No. 13, CGO, Complex Lodhi Road, New Delhi-03
- 6. Liaison Office, Assam Rifle Room No-171, North Block, MHA New Delhi -01

Subject: Regarding QRs/TDs of Communication Equipments

Please find enclosed QRs/TDs of "Tethered UAV with Digital VHF Repeater" and QRs/TDs of "Point to Multipoint communication with Aerostat" as Annexure-A & Annexure-B respectively duly approved by the competent authority is forwarded herewith for further necessary action.

Encl: 1.QRs & TDs of "Tethered UAV with Digital VHF Repeater" 2.QRs & TDs of "Point to Multipoint communication with Aerostat"

{P.R.Jha, DC (Comn)} For DIG (Equipment) Directorate General, CRPF

QRs of Tethered UAV with Digital VHF Repeater

	N	Parameter	Specifications
	1	Tethered UAV Sys	tem with digital VHF repeater should consist
		of following	
1	.1	UAV bird with back	k up battery pack
1	.2	Tethering power ba	ase station
1	.3	Ground control sta	tion
1	.4	Day & Night camer	a payload or Integrated camera payload
1	.5		ter and antenna with duplexer
1	.6	Universal battery o	harger with power supply system
	2	UAV Characteristi	ics
2	.1	Role	Seamless surveillance during day & night and
			enhance communication range
1 2	2.2	Launch and	i) Automatic Vertical Take Off and Landing
		Recovery mode	(VTOL)
		5	ii) Payload should not damage during landing o
			UAV
2	.3	Propulsion	Electrical with rechargeable batteries
		system	
2	.4	Payloads carrying	Should have capability to carry digital VHF
-	• •	capability	repeater with antenna and Day & Night camera
		capacity	payload or Integrated camera payload at the
		÷	same time
2	.5	Flight Modes	a) Fully Autonomous Vertical Take Off
-	.0	- ingite into and	b) Fully Autonomous Vertical Landing
			c)Hover at defined fixed altitude
			d) Remote piloted mode for video-based user
			navigation
			e) Vision based Autonomous Target Tracking of
			fixed and moving targets
			f) Should be controllable in real time from the
			GCS up to recovery
			g) Fully autonomous and stabilized
2	2.6	Endurance	08 hrs with all payloads. After 45 minutes of
			cooling period, bird will be ready for another 08
			hrs operational flights
2	2.7	Operating	100m AGL (Above Ground Level) or more
		Altitude	
2	2.8	Launch Altitude	2000m AMSL (Above Mean Sea Level) or more
0	2.9	Operating Wind	a) Take off: 20 km/h or more
2		Conditions	b) Landing: 20 km/h or more
F			c) Operate: 20 km/h or more
m	-		V D With Dajan Agn

Su

S N	Parameter	Specifications
2.10	Failsafe features	a) Automatic Return to Home on communication
		failure
		b) Automatic Return to Home/Land on low
		battery and power cut.
		c) Multiple GPS on-board for GPS failure
		redundancy
		d) Should support power line failure and
		seamless switching to backup battery
		e) High wind and high temperature indication
		f) Should support one motor failure during flight
3	Payload character	ristics
3.1	Payloads required	a) Should have capability to carry digital VHF
		repeater and antenna with duplexer
		b) Day & Night camera payload or Integrated
		camera payload
3.2	Payload and	a) EO/IR payload should be gimbals stabilized
	Video	on-board
	Stabilization	b) Video output should be digitally stabilized at all
		zoom levels
		c) Quality f video should not be affected by UAV
		vibrations
3.3	Electro optic (EO)	a) Color Camera with 360° pan and 90° tilt control
	Daylight Payload	
		b) Resolution: 1920 × 1080 pixel or better
		c) Optical zoom:-30X or more with minimum-
		FOV \leq 5°, maximum- FOV \geq 45° (wide field).
		Digital Zoom:- 4X or more
		d) Should be able to detect human size target at
		750-meter slant or more
3.4	Thermal Imager	a) Thermal Camera with 360° pan and 90° tilt
0.4	(TI) Night	control during flight
	Payload	b) Resolution: 640 X 480pixels or better
	Tayload	c)White/Black Hot modes
		d) Digital Zoom: 4X or more
		e) Should be able to detect human size target at
		400-meter slant or more

Lu Mo BMG

-2-

S N	Parameter	Specifications		
4	Ground control st	ation characteristics		
4.1	GCS should be MIL	STD-810G or better and IP65 Rugged laptop		
4.2	Computing Hardware			
	CPU	Intel Core i5 v Pro Processor, 2.3 GHz or better		
	Storage	1 TB or more		
	Memory	4GB or more		
	Display	10 inch or more – 1024 x 768 XGA sunlight readable screen, anti-glare		
	Keyboard & input	Touch screen		
4.3	Battery Operation	Minimum 02 hours at peak utilization		
4.4	Battery Charging time of GCS	Should be less than 3.5 hours		
4.5	Data portability	Ports for data transfer to external secondary storage devices		
4.6	Interface	VGA, HDMI, USB, 10/100/1000 Ethernet		
4.7	Capability	a) Transmit control commands to UAVb) Receive UAV flight and propulsion parametersc) Capability to control UAV during the flight		
4.8	GCS Application	a) Geographic map along with UAV location		
	Software	 b) Real-time video from the UAV with on-screen display of important parameters like:- i. Coordinate of target ii. UAV Position iii. Height of UAV above ground level iv. Mission time c) Geographic map and real-time video should be displayed at all times during the flight. d) Geographic map and real-time video views should be resizable and/or switchable to allow user to switch between big map/small video and small map/big video views through a single 		
		click/button input e) Artificial Horizon indicating UAV altitude		
4.9	Payload Controls	a) Selection and switch on/off of payloadb) Pan/Tilt/Zoom Controlsc) Point payload to ground co-ordinate function		

1 Cen

c) Point payload to ground co-ordinate function

S N	Parameter	Specifications	
4.10	Joystick Controls	a)Full Camera Control Pan/Tilt	
		b)Zoom In/Out Black/White Hot	
		c)RPV Mode	
		d)Altitude Control	
4.11	Pre-flight checks	Self-test of UAV system	
5	Communication I	ANALY COLORED TO THE REPORT OF THE REPORT	
5.1	Communication	i) Transmit control commands from GCS to UAV	
	link equipment	ii) Transmit parameter of UAV and payload to GCS	
	capability	iii) Transmit day and night video from UAV to GCS	
5.2	Type of link	Digital uplink & downlink with optic fiber cable	
5.3	Frequency Band	System should operate on S & C frequency band	
		uplink and down link, preferably on license free	
		band i.e 2.4 GHz or 5.8 GHz	
6	General System		
6.1	Weight	The weight of complete Tethered UAV bird	
0.1	Weight	including battery pack & one payload should	
		$\leq 70 \text{ kg}$	
6.0	A 11./	Less than15 minutes each	
6.2	Assembly/	Less than 15 minutes each	
	Disassembly time		
6.3	Environmental	The UAV and associated systems should operate	
	Conditions for	and stored at following environment conditions	
	Operation and	i) Damp Heat: 40°C at RH not less than 95%	
	Storage	ii) Operating temperature & Storage temp: -10°C to	
		+55°C	
		iii) Ability to withstand dust, drizzle and humid	
		conditions	
6.4	Portability and	The tethered UAV should be electrical and battery	
0.4	Operation	operated portable, light in weight, compact, for day	
	Operation	and night surveillance, capable of being carried and	
		operated by three men	
65	DettermedAV	The intelligent standard lithium based battery pack	
6.5	Battery of AV		
		should have back up of safely landing aerial vehicle	
		in event of ground transmission power failure	
6.6	Battery Charger	Suitable universal battery charger to charge the	
	of AV battery	battery.	
7	Tethering Power	Base Station	
7.1	Base station	40 kg or less	
	weight		
Cu	Mª A	the Anno Man Rajem Monver	
0/	pro Ch	my and the 19	

<u>-4-</u>

S N	Parameter	Specifications	
7.2	Input Voltage	220 V ±10%	
7.3	Wire Winch	Automatic cable winding and unwinding	
	System		
7.4	Display	Parameter such as output/input voltage	
		should be displayed	
7.5	Ventilation	Should have ventilation cooling system to	
	System	avoid system overheating	
7.6	Body Material	Should be of insulating material to avoid	
		electrical shock	
7.7	Safety Switch	Should have Safety switch to turn system off	
		in case of an accident	
8	Tether Cable	*	
8.1	Length	100 mtrs or more	
8.2	Tensile Strength	50kg or more	
8.3	Insulating	Should be of insulating material to avoid	
	covering	electrical shock	
9	Digital VHF Repe	ater	
9.1	Protocol	DMR	
9.2	RF Power Output	25 watt or more	
9.3	Frequency Band	136-174 MHz	
9.4	Туре	IP based digital VHF Repeater, should be able	
		to transmit data/voice using Ethernet/internet	
9.5	Antenna	Antenna with duplexer	
9.6	Ethernet Port	IP Ports for VoIP telephony using OFC in tether	
		wire	
10	Life of Tethered	The total technical life of tethered UAV should	
	UAV	not be less than 5 years and 6000 flying hours	
		whichever is earlier	
11	Comprehensive	2 years for Tethered UAV system and 1000	
	warranty on site	flying hours for aerial vehicle and LiPo battery	
M	$\mathbf{\tilde{f}}$	mt & A A Keyen Jone	apr l
1	, Rome (1)	m f	
	May		



S N	Parameter	Specifications	
12	2 Accessories a) Hard transportation boxes with who b) Field repair kit: 1 No's		
		c) Lithium based battery packs: 1 Nos	
	d) User, technical & maintenance		
		e) Spare landing gear sets: 1 No's	

Daud Topno, AC Insp/Tele. Sukhpal Singh Insp/RM. Apoorv Awasth SSB BSF ITBP Shashi Kant Singh, AD Dr. Raveesh Kumar, PSO(W) Maj. Rajan Kumar Aditya Bhardwaj, DC N\$G CISF DCPW BPR&D Harjinder Singh, DIG(Eqpt) Lt.Col. Harish Chander P. R. Jha, DC(Comn) CRPF Assam Rifles CRPF Ravideep Singh Sahi, IG(Comn &IT) Sanjay Arora, IPS, ADG(HQ) Virendra Agrawal, CRPF CRPF DIG(Comn),CRPF Approved/Not Approved

Dr. AP Maheshwari, IPS

-6-

Trial Directives of Tethered UAV with Digital VHF Repeater

			Directives
1	Tethered UAV Syste following	em with digital VHF repeater should	
1.1	UAV bird with back	up battery pack	BOO will
1.2	Tethering power bas		check
1.3	Ground control stati		practically.
1.4		a payload or Integrated camera payload	
1.5	Digital VHF Repeate	er and antenna with duplexer	
1.6		arger with power supply system	
2	UAV Characteristic		
2.1	Role	Seamless surveillance during day &	BOO will
2.1	RUIC		check
		night and enhance communication	
		range	practically.
2.2	Launch and	i) Automatic vertical takeoff and	
	recovery mode	landing (VTOL)	
		ii) Payload should not damage	
		during landing of UAV	
2.3	Propulsion system	Electrical with rechargeable batteries	BOO will check
	•		practically.
2.4	Payloads carrying	Should have capability to carry	BOO will check
	capability	digital VHF repeater with antenna	practically.
	capaonicy	and Day & Night camera payload	P
		or Integrated camera payload at the	
		same time	DOO 'll chool
2.5	Flight modes	a) Fully autonomous vertical take off	BOO will check
		b) Fully autonomous vertical landing	practically.
		c)Hover at defined fixed altitude	
		d) Remote piloted mode for video-	
	(based user navigation.	
		e) Vision based autonomous target	
		tracking of fixed and moving targets	
	Contraction of the second	f). Should be controllable in real	
	-	time from the GCS up to recovery	
			-
		g). Fully autonomous and stabilized	
2.6	Endurance	08 hrs with all payloads. After 45	BOO will check
		minutes of cooling period, bird will	practically fo
		be ready for another 08 hrs	03 cycles of 08
		operational flights	hrs each.
2.7	Operating altitude	100m AGL (Above Ground Level) or	BOO will check
		more.	practically.
2.8	Launch altitude	2000m AMSL (Above Mean Sea	Firm will
		Level) or more	submit OEM
2.9	Operating wind	a) Take off: 20 km/h or more	certificate.
	conditions	b) Landing: 20 km/h or more	Les Largesters
		c) Operate: 20 km/h or more	
2.10	Failsafe features	a) Automatic return to home on	BOO will chec
		communication failure	practically.
		b) Automatic Return to Home/Land	practice
1996	A STATE OF A STATE	on low battery and power cut	
		c) Multiple GPS on-board for GPS	Firm wi
		failure redundancy	submit OEI
1.3			certificate.
	Mo	1	1
		V A Q VI S	Vilar,
/	-1 9.		Day I meen
1	ISAN I IIIC	I V SO THE	14

May

SN	Parameter	Specifications	Trial Directives
		d) Should support power line	BOO will check
		failure and seamless switching	practically and firm
		to backup battery.	will submit OEM
		e) High wind and high	certificate.
		temperature indication	
		f) Should support one motor	Firm will submit OEM
		failure during flight	certificate.
3	Payload charac	teristics	
	•		BOO will check
3.1	Payloads required	a) Should have capability to carry	
	required	digital VHF repeater and antenna	practically.
		with duplexer.	
		b) Day & Night camera payload or	
		Integrated camera payload	
3.2	Payload and	a) EO/IR payload should be	BOO will check
	video	gimbals stabilized on-board.	practically.
	stabilization	b) Video output should be	1 5
	Stabilization	digitally stabilized at all zoom	
		levels.	
		c) Quality of video should not be	
		affected by UAV vibrations.	
3.3	Electro optic	a) Color Camera with 360° pan	
	(EO) daylight	and 90° tilt control during flight.	practically.
	Payload	b) Resolution: 1920 × 1080 pixel	Firm will submit OEM
		or better	certificate.
		c) Optical zoom:-30X or more with	
		minimum-FOV≤5°, maximum-	practically & firm will
		FOV \geq 45° (wide field).	submit OEM
		Digital Zoom:- 4X or more	certificate.
		d) Should be able to detect	
		human size target at 750-meter slant or more	practically.
3.4	Thermal	a) Thermal Camera with 360° pan	BOO will check
	imager (TI)	and 90° tilt control during flight.	practically.
	night payload	b) Resolution: 640 X 480pixels or	Firm will submit OEM
		better	certificate.
		c)White/Black hot modes	BOO will check practically.
		d) Digital Zoom: 4X or more	-
		e) Should be able to detect	
	1	human size target at 400-meter slant or more	
4	Ground contr	ol station characteristics	
4.1		e MIL STD-810G or better and IP65	Firm will submit
T. I		e MIL SID-810G of better and 1905	certificate of Govt.
	rugged laptop		Lab. or NABL/ILAC
1.1.1			accredited laboratory.
4.2	Computing Ha	rdware	
	CPU Inte	el Core i5 v Pro Processor, 2.3 GHz or	BOO will check
	bett	ter	practically and firm
			will also submit OEM
	Mn		certificate.
	510/1	X	Kyan Ngreent
		ATT ATT MUL	Heyen Jonenn
	(me)	with a de pe	R
	• (NA /	
			V

2

SN	Parameter	Specifications	Trial Directives
	Storage	1 TB or more	BOO will check
1.1	Memory	4GB or more	practically and
	Display	10 inch or more - 1024 x 768 XGA	firm will also
		sunlight readable screen, anti-glare	submit OEM
	Keyboard &	Touch screen	certificate.
	input		
4.3	Battery	Minimum 02 hours at peak	
	operation	utilization	
4.4	Battery	Should be less than 3.5 hours	
	charging time of GCS		
4.5	Data portability	Ports for data transfer to external secondary storage devices	
4.6	Interface	VGA, HDMI, USB, 10/100/1000 Ethernet.	
4.7	Capability	a) Transmit control commands to UAV	BOO will check practically.
		b) Receive UAV flight and propulsion	pructiculy:
		parameters c) Capability to control UAV during the flight	
4.8	GCS application software	a) Geographic map along with UAV location	BOO will check practically.
	Soleware	b) Real-time video from the UAV	
		with on-screen display of important	
		parameters like:-	
		i. Coordinate of target	
		ii. UAV Position	
	-	iii. Height of UAV above ground	
		level iv. Mission time	
		c) Geographic map and real-time video should be displayed at all	-
		times during the flight	
		d) Geographic map and real-time	
		video views should be resizable	
		and/or switchable to allow user to	
		switch between big map/small video	
		and small map/big video views	
		through a single click/button input e) Artificial horizon indicating UAV altitude.	-
4.9	Payload controls		BOO will check
4.9	rayload controls	payload	practically.
		b) Pan/Tilt/Zoom controls	practicuity.
		c) Point payload to ground co-	
		ordinate function	
4.10	Joystick	a)Full Camera Control Pan/Tilt	BOO will check
1.10	controls	b)Zoom In/Out Black/White Hot	
		c) RPV Mode	practically.
-	Mn	d)Altitude Control	
<u>zu</u>	Bur	hip & a set	afen Novient l

<u>-3-</u>

SN	Parameter	Specifications	Trial Directives
4.11	Pre-flight checks	Self-test of UAV system	BOO will check
5	Communication	Link	practically.
		i) Transmit control commands	BOO will check
5.1	Communication	from GCS to UAV	practically.
	link equipment	ii) Transmit parameter of UAV	practically.
	capability	and payload to GCS	
		iii) Transmit day and night video	
		from UAV to GCS	
5.2	Type of link	Digital uplink & downlink with	Firm will submit OEM
E 2	Engineery Dond	optic fiber cable	certificate Firm will submit OEM
5.3	Frequency Band	System should operate on S & C frequency Band uplink and	certificate
		down link, preferably on license	certificate
		free band i.e 2.4 GHz or 5.8 GHz	
6	General System		
6.1	Weight	The weight of complete Tethered	BOO will check
	0.00	UAV bird including battery pack	practically.
1		& one payload should ≤ 70 kg	1 5
6.2	Assembly/	Less than15 minutes each	
	Disassembly		
	time		
6.3	Environmental	The UAV and associated	Firm will submit
	conditions for	systems should operate and	certificate of Govt lab
-	operation and	stored at following environment	or NABL/ILAC
	storage	conditions.	accredited laboratory
		i) Damp heat: 40°C at RH not less than 95%	
1.4		ii) Operating temperature &	
-1 - 1900		Storage temp: -10°C to +55°C	
12-13		iii) Ability to withstand dust,	1
		drizzle and humid conditions	
6.4	Portability and		
	operation	electrical and battery operated	practically.
		portable, light in weight,	
		compact, for day and night surveillance, capable of being	
		carried and operated by three	
		men	
6.5	Battery of AV	The intelligent standard lithium	1
		based battery pack should have	
		back up of safely landing aerial	
		vehicle in event of ground	
6.6		transmission power failure	DOO
6.6	Battery charger	Suitable universal battery	
	of AV battery	charger to charge the battery	practically and firm will submit OEM
1	and the second		certificate.
	Mn		
	1	1	
	1 1914		
	' (She ()	L'és as a	Kayen Norneerton
	' Gm ()	ht the	& Stayen Nonenhogs

	Parameter	Specifications	Trial Directives
7	Tethering Power		
7.1	Base station	40 kg or less	BOO will check
	weight	10 kg 01 1035	practically and firm will
	weight		submit OEM certificate.
7.0	In mut Valtage	220 V ±10%	BOO will check
7.2	Input Voltage		practically and firm will
7.3	Wire Winch	Automatic cable winding	submit OEM certificate.
	System	and unwinding	submit OEM certificate.
7.4	Display	Parameter such as	
		Output/Input voltage should	
	11. Sec. 19.	be displayed	
7.5	Ventilation	Should have Ventilation	
	System	Cooling system to avoid	
		system overheating	
7.6	Body Material	Should be of insulating	
	5	material to avoid electrical	
		Shock	
7.7	Safety Switch	Should have Safety switch to	
	Salety Switch	turn system off in case of an	
		accident	
8	Tether Cable	accident	
8.1	Length	100 mtrs or more	BOO will check
5.1	Lengui	TOO INUS OF MOLE	practically and firm will
			submit OEM certificate.
	m 11 01 11	501	
8.2	Tensile Strength	50kg or more	Firm will submit OEM
			certificate.
8.3	Insulating	Should be of insulating	BOO will check
	covering	material to avoid electrical	practically and firm will
1. 1. 1.		shock	submit OEM certificate.
9	Digital VHF Rep	eater	
9.1	Protocol	DMR	BOO will check
9.2	RF Power	25 watt or more	practically and firm will
	Output		submit OEM certificate.
9.3	Frequency Band	136-174 MHz	
	Туре	IP based digital VHF	
9.4			
9.4	Type	Repeater, should be able to	
9.4	Type	Repeater, should be able to	
9.4	Type	transmit data/voice using	
		transmit data/voice using Ethernet /internet	
9.5	Antenna	transmit data/voice using Ethernet /internet Antenna with duplexer.	
		transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony	
9.5 9.6	Antenna Ethernet Port	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire	Firm will submit
9.5	Antenna Ethernet Port Life of Tethered	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of	
9.5 9.6	Antenna Ethernet Port	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be	
9.5 9.6	Antenna Ethernet Port Life of Tethered	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000	
9.5 9.6	Antenna Ethernet Port Life of Tethered	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is	
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier	undertaking
9.5 9.6	Antenna Ethernet Port Life of Tethered UAV Comprehensive	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV	undertaking
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV System and 1000 flying hours	undertaking
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV Comprehensive	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV	undertaking
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV Comprehensive	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV System and 1000 flying hours	undertaking
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV Comprehensive	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV System and 1000 flying hours for Aerial Vehicle and LiPo	undertaking
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV Comprehensive	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV System and 1000 flying hours for Aerial Vehicle and LiPo	undertaking
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV Comprehensive	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV System and 1000 flying hours for Aerial Vehicle and LiPo	undertaking
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV Comprehensive	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV System and 1000 flying hours for Aerial Vehicle and LiPo	undertaking
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV Comprehensive	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV System and 1000 flying hours for Aerial Vehicle and LiPo	undertaking
9.5 9.6 10	Antenna Ethernet Port Life of Tethered UAV Comprehensive	transmit data/voice using Ethernet /internet Antenna with duplexer. IP Ports for VoIP telephony using OFC in tether wire The total technical life of tethered UAV should not be less than 5 years and 6000 flying hours whichever is earlier 2 years for Tethered UAV System and 1000 flying hours for Aerial Vehicle and LiPo	undertaking

Pary.

Su

-5-

SN	Parameter	Specifications	Trial Directives
12	Accessories	a) Hard transportation boxes with wheels: 1set	BOO will check practically.
		 b) Field Repair kit: 1 No's c) Lithium based Battery packs: 1 Nos d) User, Technical & Maintenance Manual: 1set e) Spare Landing Gear sets: 1 No's 	

Insp/Tele. Sukhpal Singh

ITBP

Insp/RM. Apoorv Awasth BSF

Daud Topno, AC SSB

Shashi Kant Singh, AD Dr. Raveesh Kumar, PSO(W) Maj. Rajan Kumar Aditya Bhardwaj, DC DCPW

BPR&D

oweeshul

CISF

P. R. Jha, DC(Comn) CRPF

Lt.Col. Harish Chander Assam Rifles

Harjinder Singh, DIG(Eqpt) CRPF

Virendra Agrawal, DIG(Comn),CRPF

Ravideep Singh Sahi, IG(Comn &IT) Sanjay Arbra, IPS, ADG(HQ) CRPF

CRPF

Approved/Not Approved Dr. A P Maheshwari, IPS

DG, CRPF