

क्रमांक. / No. H-18026/1(TS&TD)/2016-CDN

भारत सरकार / Government of India गृह मंत्रालय / Ministry of Home Affairs समन्वय निदेशालय / Directorate of Coordination





खंड संख्या 9/ Block No. 9, केन्द्रीय सरकार कार्यालय परिसर /CGO Complex, लोधी रोड, नई दिल्ली-3/Lodhi Road, New Delhi-3 दिनांक / Dated

Sub: - Technical Specifications and Trial Directives of Digital Radios

The Technical Specifications and Trial Directives of under mentioned Digital Radios have been finalised.

- A. Digital VHF Conventional Radios
- B. DMR Tier-III Radio Trunking
- C. APCO 25 Phase-II Radio Trunking
- D. TETRA Radio Trunking
- 2. MHA has approved that these specifications & trial directives may be used by State /UT Police and CAPFs for procurement of two way Digital Radios & Digital Radio Trunking networks as per applicable GFR or State Financial Rules.
- 3. Further, if required, due to any specific requirements, the Technical Specifications may be slightly modified by the user organisations with approval of Competent Authority.

4. The above mentioned technical specifications and trial directives are uploaded at DCPW website i.e. www.dcpw.nic.in under "Technical Specifications" tab.

(Rajesh Ekka) Deputy Director (CDN-I) Tele No.:- 011-24361767

To,

- 1. Director Generals CAPFs
- 2. Director Generals State / UT Police
- 3. Commissioner of Police Delhi, Mumbai, Kolkata & Chennai

Copy to:

CEO, Government e-Market (GeM), New Delhi: - with a request to kindly include the above items in GeM portal

QRs of DIGITAL CONVENTIONAL RADIO DMR Tier II

Digital VHF Conventional Radio

| Digital |
|--------------|
| VHF |
| Conventional |
| Radio |

| 20 | 4.8 | 4.7 | 4.6 | 4.5 | 4.4 | 4.3 | 4.2 | 4.1 | 4 | 3.6 | 3.5 | | 3.4 | | 3.3 | 3.2 | 3.1 | 3 | | 2.10 | 2.9 | 2.8 |
|------------------|------------------|------------------|---------------------------|--------------|------------------|-----------------------------------|---------------------|-----------------------|-----------------------------|-----------------------|----------------------|---------------------|--------------------|-----------------------------|----------------------|----------------------------|-------------------------------|--------------------|--|---|---------------------|---------------------|
| Low Pressure | Rain | Salt | Water intrusion & Dust | Shock & Drop | Vibration | Humidity | Storage Temperature | Operating Temperature | ENVIRONMENTAL | Audio Distortion | Audio Output | | Inter-modulation | Selectivity | Adjacent Chanel | Sensitivity (digital) | Sensitivity (Analog) | RECEIVER | Security (Optional) | Communication | Digital Vocoder | Audio Distortion |
| MIL-STD -810 F/G | MIL-STD -810 F/G | MIL-STD -810 F/G | MIL-STD -810 F/G or IP-67 | | MIL-STD -810 F/G | 95% Max. at +40° C non-condensing | -40°Cto+70°C | -30°Cto+55°C | | Less than 3 % | W III OOC IIIWI | Minimum son mW | 70dB or better | | 60dB or better | 0.30μV at 5% BER or better | 0.30μV (12dB SINAD)or better | | to support 3 rd Party Encryption. | System should have in built encryption and should also have provision | AMBE +2 | Less than 3 % |
| | | | | | | | | ational Recognised | OFM Certification supported | OSCI / LPC1 W 10 1031 | Hear / DCDW/ to test | User / DCPW to test | ational Recognised | OEM Cartification supported | Oser / DCF w to test | User / DCPW to lest | User / DCFW to test | TI / DCDW/ to toot | | User / DCPW to test | User / DCPW to test | User / DCPW to test |

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| eatu |
| re. |
| wise (|
| Configuration: |
| |

| Digita | 5.1.3 | 5.1.2 | 5.1.1 | 5.1 | SI |
|--------------------------------|-------------------------------|--|----------------------|--------------------|-------------|
| Digital VHF Conventional Radio | 5.1.3 Type of Battery Charger | 5.1.2 Output Voltage | Input voltage | Battery charger | ACCESSORIES |
| My white | Li-ion /Li-Poly | As per battery pack (Information will be provided by OEM/ Vendor). | 230V±10%, 50Hz | | |
| Among | User / DCPW to test | User / DCPW to test | User / DCP w to test | II / DCDW/ to toot | |
| AND BY | | | | | |

| | 6.3 Continuo (CTCSS) | 6.2 Low battery alert | 6.1 Simple p | 6 Configu | 5.15 Case | 5.14 No. of Battery | 5.13 Literature | 5.12 Programming Kit | | 5.1.7 No. of Ch | | 5 1.5 Indication | 5.1.4 Protection |
|--------------------------|--|-----------------------|-----------------------|-------------------------------------|---|--|--|--|---|-------------------------------------|---|--|--|
| The solone of analog and | Continuous Tone Coded Squelch System (CTCSS) | ery alert. | Simple press to talk. | Configuration VH1 (without display) | | ittery | | ning Kit | Hand free Kit (VOX unit with PTT) (optional). | No. of Charging Pocket | ime | | |
| | | | | | One good quality case with belt clip & shoulder strap to house the Radio Sets in operation. | Two lithium-Ion or Li-polymer batteries with each radio set. | a) User manual with each radio sets should be provided free of cost in soft as well as hard copy. b) Technical repairing & maintenance manual, with complete block diagram, circuit layout, PCB layout, component & wiring diagram etc should be provided as per user's requirement in soft as well as hard copy. | All necessary Software and Hardware required for programming of the set independently for lifelong support with regular updates. | The offered sets should be compatible with any one or more of the following variants 1. Bone Conduction 2. Ear Plug 3. Headphone, etc. | 1/2/6 (vendor to quote accordingly) | Standard chargers 6 to 14 Hrs Rapid Charger -1 to 3 Hrs | Visual indication for all modes of charging status | (1) Reverse polarity protection(2) Short circuit protection |
| lear / li CW TO Test | User / DCPW to test | Oser / DCP w to test | User / DCPW to test | Transformitte tot | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | Oser / DCF w to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test |

Digital VHF Conventional Radio

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| i. Time to First Fix (TTFF) cold start : < 2minutes ii. Time to First Fix (TTFF) hot start : <20seconds Horizontally accuracy : <10 meters | 8.2 Should have built-in GPS feature with following specifications: | 8.1 All features of configuration of VH2. | 8 Configuration VH3 (with GPS) - | 7.11 Text messages and predefined message (Optional with keypad) | 4 | - | 7.8 Emergency SOS/SIREN | 7.7 Chanel Scanning with call quieting facility. | 7.6 PTT ID Encode. | 7.5 Capable of VOX hand free operation. | _ | 7.3 Busy Channel Lockout. | 7.2 Any one of 2-Tone/5-Tone/ DTMF signalling. | 7 Configuration VH2 (with display) 7.1 All features of configuration VH1. |
|--|---|---|----------------------------------|--|---------------------|---------------------|-------------------------|--|----------------------|---|---------------------|---------------------------|--|---|
| | User / DCPW to test | User / DCPW to test | | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCF w to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test |

User Organisation may choose any of the above configurations.

Digital VHF Conventional Radio

ORS OF DIGITAL VHF CONVENTIONAL RADIO

B. MOBILE RADIO

| (Optional) | - | 2.8 Audio Distortion | 2.7 Audio Response | 2.6 Adjacent Channel Power | 2.5 FM Hum & Noise | 2.4 Modulation Limiting | 2.3 Digital Modulation | 2.2 FM Emission | 2.1 RF Power Output | 2 TRANSMITTER | 1.11 Air Interface Standards | | 1.10 EMI/EMC | 1.9 Weight | 1.8 Antenna Impedance | 1.7 Frequency Stability | | 1.6 Protection | 1.5 Operating Voltage | 1.4 Channel Spacing | 1.3 Channel Capacity | 1 | TOMA | | 1 1 Frequency Range | 1 GENERAL | |
|--|---|----------------------|---------------------|----------------------------|---------------------|-------------------------|------------------------|-------------------------------------|--------------------------------------|---|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------------|-----------------------|-------------------------|---------------------|---------------------------------|-----------------------|---------------------|--|--------------------------------|----------------------|----------------------------|------------------------|-----------------------|-----------------|
| provision to support 3 rd Party Encryption. | System should have in built encryption and should also have | Less than 3 % | +1,-3dB | -60 dBc or better | -40 dB or better | ±2.5KHz @ 12.5 KHZ | 4FSK | 11K0F3E, , 7K60FXE, /K00FXD,/K00FXW | 5 to 25 Watts or More (programmatic) | (((() () () () () () () () (| Shall be open standards britis is a | Chall be onen Standards DMR Tier-II | EISLEN 301 489-1 & E131301 402-27 | Less than 2 kg | 5082 | +1:2 11 11 01 00000 | +1 S PPM or hefter | b) Protection against high VSWR | 10.8 V to 15.0 VDC | 12.3 15.6 (17) | 1) SULTA CONTRACT CONTRACT AND CONTRACT AND CONTRACT CONTRACT AND CONTRACT CONTRACT AND CONTRACT | 255 or more (Set with display) | 2 – Slot | (Organisation may specify) | VHF / UHF | | |
| | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | International Recognised Laboratory | OEM Certification supported by | International Recognised Laboratory | OEM Certification supported by | User / DCPW to test | User / DCPW to test | User / DCPW to test | | User / DCPW to test | User / DCPW to test | User / DCPW to test | User / DCPW to test | USEI / DCF W to test | II and DODW to test | OSCI / D'CI 11 to took | I fear / DCPW to test | TRIAL DIRECTIVE |

Digital VHF Conventional Radio

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| 4.2 Storage Temperature 4.3 Humidity 4.4 Vibration 4.5 Shock & Drop 4.6 Water intrusion & Dust 4.7 Salt 4.8 Rain 4.0 Low Pressure | 3.5 Audio Output 3.6 Audio Distortion 4 ENVIRONMENTAL 4.1 Operating Temperature | 3.1 Sensitivity (Analog) 3.2 Sensitivity (digital) 3.3 Adjacent Chanel Selectivity 3.4 Inter-modulation | |
|--|---|--|--|
| -40°Cto+70°C 95% Max. at +40° C Non-condensing MIL-STD -810 F/G MIL-STD -810 F/G MIL-STD -810 F/G or IP-54 MIL-STD -810 F/G MIL-STD -810 F/G MIL-STD -810 F/G | Minimum 3 W Less than 3 % -30°Cto+55°C | 0.30μV (12dB SINAD)or better 0.30μV at 5% BER or better 60dB or better 70dB or better | |
| | OEM Certification supported by International Recognised Laboratory | User / DCPW to test OEM Certification supported by International Recognised Laboratory User / DCPW to test | |

User Organisation may choose any of the above configurations.

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Low Pressure

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ORS of DIGITAL VHF CONVENTIONAL RADIO

C. REPEATER

| 1 |) | | | |
|---|-------------------------------------|--|----------------------------|------|
| 3 | | | RECEIVER | ယ |
| | Coci De Carrier | Less than 3 % | Audio Distortion | 2.8 |
| | Hiser / DCPW to test | +1, -3db | Audio Response | 2.7 |
| | User / DCPW to test | -60 dBc or better | Adjacent Channel Power | 2.6 |
| | User / DCPW to test | -40 dB or better | FM Hum & Noise | 2.5 |
| | User / DCPW to test | ±2.5 KHz @ 12.5 KHz | Modulation Limiting | 2.4 |
| | User / DCPW to test | 4FSK | Digital Modulation | 2.3 |
| | User / DCPW to test | 11K0F3E, 7K60FXE, 7K60FX, 7K60FXW | FM Emission | 2.2 |
| | User / DCPW to test | 0 | RF Power Output | 2.1 |
| | Liser / DCPW to test | | TRANSMITTER | 2. |
| | International Recognised Laboratory | OTHER DO OFFICE COMPANIES OF STATE OF S | All lilleriace stailuai us | 1.17 |
| | OEM Certification supported by | Chall be open Standards DMR Tier-II | A. T. J E Standards | 1 |
| | International Recognised Laboratory | | EMILEMIC | 1.10 |
| | OEM Certification supported by | ETCLEN 301 489-1 & ETCL 301 489-5 | TIORCHOIL | 1.13 |
| | User / DCPW to test | Reverse polarity | Protection | 1 15 |
| | USET / DUT W 10 test | Better than 1.5 | VSWR | 1 14 |
| | USEI / DCI W 10 1631 | Indicator for Transmit & Receive | Display | 1.13 |
| | Vicer / DCDW/ to test | Less than 15Kg | Weight | 1.12 |
| | User / DCPW to test | 100 % | Duty Cycle | 1.11 |
| | User / DCPW to test | 50Ω | Antenna Impedance | 1.10 |
| | User / DCPW to test | Ethernet port for IP connectivity | Interface | 1.9 |
| | User / DCPW to test | | Frequency Stability | 1.8 |
| | User / DCPW to test | 11.25VDC and 230 VAC ± 10%, 50 Hz | Operating Voltage | 1.7 |
| | USEL / DCF W to test | 12.5 KHz | Channel Spacing | 1.6 |
| | User / DCDW to test | 16 or more | Channel Capacity | 1.5 |
| | User / DCPW to test | Fully automatic for Analog & Digital | Operating Selection | 1.4 |
| | The / DCBW/ to tost | Dual standard (Digital & Analog) | Operating Mode | 1.3 |
| | User / DCPW to test | 2-Slot | TDMA | 1.2 |
| | Hear / DCPW to test | (Organisation may specify) | | |
| | Oser/ DCr w to test | VHF / UHF | Frequency Range | 1.1 |
| | IRIAL DIRECTIVE | | GENERAL | 1 |
| | TRIAL DIRECTIVE | | | |

Digital VHF Conventional Radio

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| ii) Technical repairing & maintenance maintai with complete officers. |
|---|
| i) Users manual with each radio sets should be provided need to be sets should be set to be set |
| Programming kit All necessary Software and Hardware required for programming of the set independently. Software must support latest Windows OS. |
| Antenna 6 dB gain Omni Directional antenna with 45 meter Kr. Cable No- 217 for base station will be provided as per user's requirements. |
| & Mounting |
| Accessories: |
| Humidity 95% Max. at +40° C non- condensing |
| Storage Temperature -40°Cto+70°C |
| Operating Temperature -30 Cto+33 C |
| |
| Audio Distortion Less than 3 % |
| Inter-modulation 70 dB or better |
| Adjacent Chanel Selectivity 60 dB or better |
| Image Rejection 65dB or better |
| Sensitivity (Digital) 0.30 µV at 5% BEK or better |
| Sensitivity (Analog) 0.30 µV (12dB SINAD) or better |
| |

Note:-

The Technical Specifications & Trial Directives may be used for procurement as per the applicable GFR or State Financial Rules.

competent authority. Technical Specifications may slightly be modified by user organisations for specific requirement, if any, with the approval of

2. User Organisations may ask the vendors for lifetime support for supplied Software updates / patches, Warranty and Spare support

as per the need.

Digital VHF Conventional Radio

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Deputy Superintendent of Police, Haryana Police

Deputy Director, (R K Vermà)

> Assistant Commissioner of Police, Delhi Police (Amar Singh Meena)

Deputy Commissioner of Police, (Balkrishna Yadav) Mumbai Police

Additional Director, (Devendra Singh)

DCPW

Deputy Director, DCPW

(D. Mukhopadhyay Joint Director, DCPW

(Rajesh Ekka)

Deputy Commandant, CRPF

(N& FLakshmi)

Deputy Inspector General, Andhra Pradesh Police

Digital VHF Conventional Radio

ORs of RADIO TRUNKING SYSTEM - DMR Technology, Tier-III

A. BASE STATION UNIT (BSU):

| DMR Radio | 4.1 | 4 | 3.4 | ι. i.s | 3.2 | 3.1 | | 2.5 | 2.4 | 2.3 | 2.2 | 2.1 | 2 | 1.8 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | | S.I. No. | |
|--|--|-----------------|------------------------------|-------------------------------------|----------------------------|---------------------------------|----------|--------------------|--------------------|------------------------|--------------------|---|-------------|--------------------|--|---|--------------------|---------------------|---|--|------------------------------|----------|------------------|
| adio | Separate antenna system for Tx | Antenna System | Adjacent Channel Selectivity | Inter-modulation rejection | Sensitivity (Digital) | Sensitivity (Analog) | RECEIVER | Modulation | Audio Response | Adjacent channel power | FM Hum & Noise | Power | TRANSMITTER | Vocoder | Power Supply | Emission | Channel Spacing | Frequency Stability | Technology | Duplex Spacing | Frequency Range | GENERAL | SPECIFICATIONS |
| Water the the same of the same | Separate antenna system for Tx and Rx which shall include High Gain antenna system | | ≥ 65dB @ 12.5 KHz | 70dB or better | 0.30μV at 5% BER or better | 0.30 μV at 12db SINAD or better | | 4FSK | +1, -3dB | -60 dBc or better | -40 dB or better | 1 to 50W Or 50 to 100 W (User Selectable) | | AMBE+2 | $230 \text{ V} \pm 10\%$, 50 Hz | Analog - 11K0F3E Digital - 7K60FXE & 7K60FXD / 7K60FXW | 12.5 KHz | ±0.5 PPM or better | TDMA- two slot DMR Tier-III Radio Trunking Protocol, ETSI Standard | 10 MHz for 400 MHz Band 45 MHz for 800 MHz Band | 400 MHz Band OR 800 MHz Band | | |
| No. X | User/ DCFW to lest | TI/DONN to toot | User/ DCPW to test | International Recognised Laboratory | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | Trial Directives |

CEX 1 X

| | 95% Max. at +40°C non-condensing | Humidity | 0 3 |
|---|---|--|----------|
| | -40°Cto+70°C | Storage Temperature | 8.2 |
| International Recognised Laboratory | -30°Ct0+55 C | Operating Temperature | 8.1 |
| OEM Certification supported by | 20°C - EE°C | ENVIRONMENTAL | ∞ |
| | y. | Leased line independently. | |
| User/ DCPW to test | BASE STATION to BASE STATION AND MASTER STATION CONTROL INTERFACE: For inter cell traffic communication with microwave, optical fibre or PSTN | BASE STATION to BASI INTERFACE: For interest | 7 |
| OEM Certification supported by International Recognised Laboratory | AIR INTERFACE STANDARDS: Shall be open Standards DMR Tier-III | AIR INTERFACE STAN | 6 |
| User/ DCPW to test | Each channel should be configurable to traffic and control unit and vice-versa. | Each channel should be config | 5.2 |
| User/ DCPW to test | ah P | CHANNEL UNII: | , OI |
| | n KF cables | Surge protecting devices in KF cables | 4.2 |
| User/ DCPW to test | for Tx (1+1) and Kx. | Minimum 10dBi or better for 1x (1+1) and Kx. | - |
| | 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | |) |

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B. MASTER CONTROL UNIT

ESSENTIAL FEATURES:

| ESSEIN I | ESSENTIAL PEATONES. | | |
|----------|--|---------------------|--|
| | TELECATIONS | Trial Directives | |
| S.I. MO. | | - Control | |
| | g equipment. | User/ DCDW/ to test | |
| 1.2 | ssary sub systems/ modules and one time licensed system | OSEI/ DCI W to too | |
| | James aritch/controller and | Her/DCPW to test | |
| 1.3 | im to switch from primary to secondary switch/controller and | | |
| | 1 | User/ DCPW to test | |
| 1.4 | ite hot standby. | User/ DCPW to test | |
| 2 | | User/ DCPW to test | |
| w | Minimum No. of Carriers Station sites supported – 00 nos. | User/ DCPW to test | |
| 4 | - | User/ DCPW to test | |
| 5 | terminal supported- 2000 Willell will include income series persons | | |
| | | User/ DCPW to test | |
| 6 | Minimum No. of talk groups - 50 | User/ DCPW to test | |
| 7 | Dispatch Console: Minimum 2 Nos. Of Illote as per user requirement. | | |
| 7.1 | a) Individual calls, group calls, all calls, broadcast calls, emergency calls and patched group calls. | | |
| | | | |
| | | | |
| | e) The Dispatch console shall maintain call and activity log for audit. | | |
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|---|--|---|--|--|--|
| Late Entry: Shall support to Group calls. | Scanning: Shall support talk group scan, priority scan | Voice Call Type: Group call, individual calls, emergency calls, broadcast calls. Non Voice calls / data calls: a) Inhibit / Uninhibit b) Authentication registration c) Location information transfer d) Status, short data messages e) Packet data transfer facility for customized application f) Shall support AVLS | Fault management: To monitor and to display the status and status history of a system componen and should also perform diagnostics when needed | a) NMT shall work in closed captive Network environment and should have hot standby redundancy b) NMT shall be equipped with all necessary sub-systems/ modules and installed with necessary licensed software. c) The NMT shall provide map of the equipment in the network, such as switch controllers, radio base stations, servers and work stations etc. in Trunked Radio System with status and alarm indication. d) NMT should display real time channel activity and store activity logging of system components. e) The NMT shall provide user friendly GUI to the NMS administrator and operators with pull-down menu, function keys, online help screens, windows, color pictures and statistical graphs for easy operation and interpretation of information. f) The call processing shall not affected by failure of network management system/ terminal. | Noticel Management Terminal (NMT) |
| User/ DCPW to test | User/ DCPW to test | | | | User/ DCPW to test |
| | | Scanning: Shall support talk group scan, priority scan Late Entry: Shall support to Group calls. | Non Voice Calls / data calls: a) Inhibit / Uninhibit b) Authentication registration c) Location information transfer d) Status, short data messages e) Packet data transfer facility for customized application f) Shall support AVLS Scanning: Shall support talk group scan, priority scan Late Entry: Shall support to Group calls. | Fault management: To monitor and to display the status and status history of a system component and should also perform diagnostics when needed Voice Call Type: Group call, individual calls, emergency calls, Broadcast calls. Non Voice calls / data calls: a) Inhibit / Uninhibit b) Authentication registration c) Location information transfer d) Status, short data messages e) Packet data transfer facility for customized application f) Shall support AVLS Scanning: Shall support talk group scan, priority scan Late Entry: Shall support to Group calls. | a) NMT shall work in closed captive Network environment and should have hot standby redundancy. b) NMT shall be equipped with all necessary sub-systems/ modules and installed with necessary licensed software. c) The NMT shall provide map of the equipment in the network, such as switch controllers, radio base stations, servers and work stations etc. in Trunked Radio System with status and alarm indication. d) NMT should display real time channel activity and store activity logging of system components. e) The NMT shall provide user friendly GUI to the NMS administrator and operators with pull-down menu, function keys, online help screens, windows, color pictures and statistical graphs for easy operation and interpretation of information. f) The call processing shall not affected by failure of network management system/ terminal. Fault management: To monitor and to display the status and status history of a system component and should also perform diagnostics when needed Non Voice calls / data calls: a) Inhibit / Uninhibit b) Authentication registration c) Location information transfer d) Status, short data messages e) Packet data transfer facility for customized application f) Shall support talk group scan, priority scan 1.4 Late Entry: Shall support to Group calls. |

| 1 | | User/ DCPW to test |
|-----|--|---------------------|
| 8.6 | Add/remove subscribers | |
| | a) Add/remove multiple subscribers | |
| | _ | |
| | | |
| | _ | |
| | Add a system call group | User/ DCPW to test |
| 87 | m Management Features: | |
| : | a) Transmission Trunking | |
| | | |
| | | |
| | | |
| | - | |
| | | |
| | | |
| | _ | |
| | i) Roaming | |
| | j) Group location restrictions | |
| | k) Subscriber location / restrictions | User/ DCPW to test |
| × | on, recovery software allu database backup | Thom/ DCDW/ to test |
| | Demote Killing: Provision to kill or disable the Radio remotely. | OSEI/ DCI W 10 1001 |
| 9 | Remote range and the capability of tracking | User/ DCPW to test |
| 10 | Accounting management: The accounting management reasons about the traffic on the activity of radio users on the system and allow the customer to produce reports about the traffic on | |
| | the system. | User/ DCPW to test |
| 1 | ice management: The performance readure shall have the captures of existent resolutees. | |
| | optimize the utilization of system resources. | User/ DCPW to test |
| 12 | a) System should support multiple number of network management user accounts. | |
| | b) Access rights to the various network management approximations. c) Multiple levels of access rights to users for performing tasks with these applications. | |
| | The security management feature shall have the capacitity of the log-on names and passwords to the NMS. | |
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OPTIONAL FEATURE: -

| | the Dispatcher's screen) as the Dispatcher moves the curson. Latitude and rought | |
|---------------------|---|------|
| OSCI/ DCI W W WS | Map Grid: Shall be capable of continuously reporting one or more of the following grid references (to | 11.4 |
| Hear/ DCPW to test | d. Database information associated with a graphic symbol. | |
| | c. Address ranges. | |
| | b. Co-ordinate positions. | |
| | a. Street/road and cross-street/road names. | |
| User/ DCPW to test | Map Query: Shall undertakes a number of queries based upon specific map features to determine: | 11.3 |
| Oser, Dor w to test | Shall be capable of locating and displaying geographical information using defined attribute type | 11.2 |
| Ular DCPW to test | ar ar | 11.1 |
| User/ DCPW to test | _ | 11 |
| User/ DCPW to test | expandable Carrier AND DISPATCHING | |
| | | |
| | j) Data should be recorded in main site and other (fall back/Disaster recovery) site recorder | |
| | | |
| | | |
| | D, Group ID, etc or Provision to search records, replay the voice conversations, back-up and restore facility | |
| | ay with its metadata, ie Date, | |
| | e) Telephone call through telephone gateway | |
| | d) Individual call recording with facility to disable this feature. | |
| | c) Calls to and from Dispatch console and subscriber radios. | |
| | requirement b) Grown call within subscriber radios | |
| | a) Minimum 16 Nos. of Channel and should be modularly expandable as per the user | 10.1 |
| User/ DCPW to test | | |
| | Voice Recording System: | 10 |

DMR Radio

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| 12 | | 11.6 | | 10 |
|--|--|--|--|--|
| Health Status: Health Status of Remote radio silouid be available in the second of the | automatically updated as the status-changes. | The incident and resource symbols should be able to be come and the state of the st | Automatic Vehicle Location (AVL). He had be colour coded and have that colour User/ DCPW to test | Resource symbols shall be able to be automatically placed on the map display at the location as reported from Automatic Vehicle Location. For the continuous streaming of coordinates, the system shall be able to continuously update the vehicle symbol as the coordinates are received from the |
| | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test |

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C. DIGITAL HANDHELD RADIO:

| DMR Radio | 2.5 | 2.4 | 2.3 | 2.2 | 2.1 | 2 | | 1.13 | 1 12 | | 1.10 | 1.9 | 1.8 | | 1.7 | 1.6 | 1.5 | 1.7 | 14 | 12 | 1.2 | 1.1 | | SI No. | C. DIGITA |
|------------------|--------------------------------|------------------------------|----------------------|--------------------|------------------------------------|-------------------------------|---------------------|-----------------------|--------------------------------|--------------------|--------------------|---------------------|--|---|---|--------------------|--------------------|------------------------------------|--------------------|--------------------|-------------------------|--|--------------------|----------------|-----------------------|
| Idio | Adjacent Channel Power | FM Hum & Noise | Modulation Deviation | Digital Modulation | RF Power Output | TRANSMITTER | minimum two vendors | Interoperability with | Protection | VSWR | Display | Frequency Stability | Battery Capacity | numbers) | Number of contacts (individual / group call | Channel Spacing | Number of Channel | Emission | Operation Modes | TDMA | Duplex Spacing | Frequency Range | GENERAL | SPECIFICATIONS | DIGHAL HANDHEDD XXXXX |
| My Handy Charles | -60 abc of belief at 12:2 ixin | -40 dB or better at 12.5 KHz | ±2.5 KHZ at 12.5 KHZ | 4FSK DMR TIER-III | 3W for 800 MHz Band (programmable) | AW for 100 MHz (programmable) | Association. | Working Group (| Reverse Polarity and High VSWK | Better than 1.5 | Alphanumeric | ±1.5 PPM or better | capacity. Bidder to specify the specific voltage | The large ship recharges his hattery of capacity 2000 mAh or higher | 1000 or better | 12.5 kHz | 1000 or better | 11K0F3E, 7K60FXE, 7K60FXD, /K60FAW | DMR Tier III | 2-Slot | 45 MHz for 800 MHz Band | 400 MHz Band On 300 Pilitarian Strain | | | |
| KHEKE DOL CHE | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW To Test | | Trial Directives |

| DAD Radio | 5.9 | 5.8 | 5.7 | 5.6 | 5.5 | 5.4 | 5.3 | 5.2 | 5.1 | U) | 43 | 4.2 | 4.1 | 4 | 3.6 | 3.5 | | | 3.4 | | 3.3 | 3.2 | 3.1 | ω L | 2.7 | 2. / | *** |
|---------------|---------------|-----------------|------------------|------------------------|--------------------------|------------------|-------------------------|---------------------|-----------------------|-------------------|--|-----------------------------|------------------------------|--------------------|--------------------|---------------|--------------------|--------------------|-----------------------|----------------------------|-------------------|----------------------------|----------------------|---------------------------------|--------------------|---------------------|---------------------|
| | Low Pressure | Rain | Salt | Water intrusion & Dust | Drop | Vibration | Humidity | Storage Temperature | Operating Temperature | ENVIRONMENTAL | Horizontal accuracy | Time to first fix hot Start | Time to first fix cold start | GPS | Audio Distortion | Audio Carpur | Andio Output | | Illel-Illoading | Selectivity | Adjacent Chanel | Sensitivity (digital) | Sensitivity (Analog) | RECEIVER | Digital Vocoder | Audio Response | |
| Hank. Amore | WILL-DID CASA | MII-SID-810 F/G | WIL-31D -810 F/G | 11. | MIL-SID -810 F/G & IP-67 | MIL-310 -810 1/G | 95% Max. at 140 C 11011 | -40°Cto+70°C | - 100 CE 100 C | 20°つかナスス°つ | < 10 Interest | 20 Second | 20 Second | ✓ Minutes | | Less than 3 % | Minimum 500m W | | | 70dB or better | | 60dR or better at 12.5 KHz | BER or b | 0.30., V (12dB SINAD)or better | AMDL | AMRE +2 | +1_3dR |
| HAKE KON SEWE | | | | | | | | | Recognised Laboratory | OEM Certification | and the state of t | OSEI/ DCI W to took | User/ DCPW/ to test | User/ DCPW to test | Heer/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | Recognised Laboratory | supported by International | OEM Certification | OSCI, DOL 11 10 | User/ DCPW to test | User/ DCPW to test | Ther/ DCPW to test | OSET/ DCF W 10 1035 | User/ DCPW/ to test |

| No. of Battery Literature | Programming Kit Leather Case | unit with PTT) (Optional) | No. of charging pockets | Indication Charging Time | Charger Protection | A CESSORIES Battery Charger Input Voltage Output Voltage Type of Battery | |
|--|---|--|--|-----------------------------|---|--|--|
| a) User manual with each radio sets should be provided free of cost in soft as well as hard copy. b) Technical repairing manual, with complete block diagram, circuit layout, PCB layout, component & wiring diagram etc should be provided as per user's requirement in soft as well as hard copy. | All necessary Software and France in the independently for lifelong support with regular updates. One good quality leather case with belt clip and shoulder strap. One for Lie only batteries with each radio sets. | Bone Conduction Ear Plug Headphone, etc Hardware required for programming of the set | with minimum any of the two or more variants | | Reverse Polarity Protection Short Circuit Protection Short Circuit Protection The state of for all modes of charging status | 230V + 10%, 50 Hz As per battery pack (Information will be provided by OEM / Vendor) ULi-lon / Li-poly | |
| User/ DCPW to test | User/ DCPW to test User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test User/ DCPW to test | User/ DCPW to test User/ DCPW to test User/ DCPW to test User/ DCPW to test | |

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2. QRs of RADIO TRUNKING SYSTEM - DMR Technology, Tier-III

| DMR Radio | | 2.5 Adjacent Channel Power | | | | .1 | 2 TRANSMITTER | | 113 Interoperability with | 1.11 VOWN | | | 1.8 Operating voices | | (individual / group curr | | | 1.5 Number of Channel | 1.7 Emission | | | TDMA | 1.2 Duplex Spacing | 1.1 Frequency Range | 3 | SI No. SPECIFICATIONS | D. DIGITAL MIOBILE RADIO: |
|---------------------|---|----------------------------|------------------------------|----------------------|---------------------|--------------------|----------------------------|---------------------|------------------------------|--|--------------------|---------------------|----------------------|--------------------|--------------------------|----------------|-----------|-----------------------|--------------------|-----------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------|-----------------------|---------------------------|
| My Start (Starte) | +1,-3uD | -60 dBC of ocurs in series | -40 dB or better at 12.5 KHz | ±2.5 KHZ at 12.5 KHZ | AFON DIVIN TIEST OF | William 25 W 105 | Minimum 25 W for all bands | Association | ation from Technical Women's | Reverse Polarity and High VSWK Tochnical Working Group (TWG) of the DMR | Better than 1.5 | Alphanumeric | ±1.5 PPM or better | 11.25 VDC | | 1000 or better | 12.3 8.12 | 10 & 1:112 | 1000 or befter | 11K 0F3F 7K60FXE, 7K60FXD,7K60FXW | DMR Her III | 2 – Slot | 45 MHz for 800 MHz Band | Ban | OR 800 MHz Band | | |
| \$ P 2 | \$ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ | Osell Der in so | User/DCPW to test | User/ DCPW to test | User/ DCPW to test | 11cer/DCPW to test | Hiser/DCPW to test | Ilser/ DCPW to test | | R User/ DCPW to test | User/ DCPW to test | User/ DCP w to test | User/ DCPW to test | User/ DCPW to test | User/DCPW to test | | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | Heer/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | Hear/ DCPW to test | I ser/ DCPW to test | Trial Directives |

| 5.9 | 5.8 | 5.7 | 5.6 | 5.5 | | 5.4 | 5.3 | 5.2 | | 5.1 | 5 | 4.3 | 4.2 | 2 : | 41 | 4 | 3.6 | 3.5 | | | 3.4 | 3.3 | 3.2 | | | | 27 |
|------------------|------------------|------------------|------------------------|----------------------|------------------|------------------|-----------------------------------|---------------------|-----------------------|----------------------------|-------------------|---------------------|-----------------------------|-----------------------------|------------------------------|--------------------|------------------|--------------------|--------------------|-----------------------|----------------------------|-----------------------------|---------------------------|----------------------------|-------------------------------|-------------------|---------------------|
| Low Pressure | Rain | Salt | Water intrusion & Dust | | C1- 1- 0- D | Vibration | Humidity | Storage Temperature | | Operating Temperature | ENVIRONMENTAL | Horizontal accuracy | I lille to mar mar nor orms | Time to first fix hot Start | Time to first fix cold Start | GPS | Audio Distortion | Audio Output | | | Inter-modulation | Adjacent Chanel Selectivity | Sensitivity (digital) | Sensitivity (Analog) | Canality (Analog) | RECEIVER | Digital Vocoder |
| MIL-STD -810 F/G | MIL-STD -810 F/G | MIL-STD -810 F/G | | THE CAR OLD CAR IDSA | MIL_STD -810 F/G | MIL-STD -810 F/G | 95% Max. at +40° C non-condensing | -40°Cto+70°C | | -30°Cto+55°C | | 4 | < 10 Meter | < 20 Second | <2 Minutes | | Less than 3 % | IVIIIIIIIIII 5 W | Minimum 3 W | | /Odb or bener | 600B of better at 12.5 Kitz | 0.30µ v m 3/8 DEX 0. COMP | 0.20 V at 4% RFR or hefter | 0.30 U (12dB SINAD)or better | | AMBE +2 |
| | | | | | | | | | Recognised Laboratory | supported by International | OEM Certification | | User/ DCPW to test | OSCI/ DCI W to test | Illow/ DCDW/ to test | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | Recognised Laboratory | supported by International | OEM Certification | User/ DCPW to test | User/ DCPW to test | Oser/ DCf w to test | II/ DCDW/ to test | OSEI/ DCI W to test |

Note:-The Technical Specifications & Trial Directives may be used for procurement as per the applicable GFR or State Financial Rules.

Technical Specifications may slightly be modified by user organisations for specific requirement, if any, with the approval of competent

DMR Radio

2. User Organisations may ask the vendors for lifetime support for supplied Software updates / patches, Warranty and Spare support as

per the need.

3. If required, submitted OEM Certificates results may be verified from the available certified laboratories.

Deputy Superintendent of Police, Haryana Police

Deputy Director, R'K Verma

> Assistant Commissioner of Police,

Delhi Police

Deputy Commissioner of Police, (Balkrishna Yadav) Mumbai Police

(Amar Singh Meena)

(Rajesh Ekka) DCPW

(D. Mukhopadhyay) Joint Director,

DCPW

Deputy Director,

Deputy Commandant, CRPF

Deputy Inspector General, Andhra Pradesh Police (N S J Lakshmi)

Additional Director, (Devendra Singh)

DCPW

QRs of RADIO TRUNKING SYSTEM - APCO PHASE-II Technology

A. BASE STATION UNIT (BSU):

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| | | | PIO IIPOCTIVOS |
|----------|------------------------|---|---|
| S.I. No. | GENERAL | | A H ASSA A D AR A G G G G G G G G G G G G G G G G G |
| Ξ | Frequency Range | 400 MHz Band OR 800 MHz Band | User/ DCPW to test |
| 1.2 | Duplex Spacing | 10 MHz for 400 MHz Band | User/ DCPW to test |
| | , | 45 MHz for 800 MHz Band | |
| 1.3 | Technology | TDMA- two slot | User/ DCPW to test |
| | | APCO P25 Phase-II | |
| 1.4 | Frequency Stability | ±0.5 PPM or better | User/ DCPW to test |
| 1.5 | Channel Spacing | 12.5 KHz | User/ DCPW to test |
| 1.6 | Emission | 9K80D7W | User/ DCPW to test |
| 1.7 | Power Supply | 230 V ± 10% 50 Hz | User/ DCPW to test |
| 1.8 | Vocoder | AMBE+2 (Dual Rate) | User/ DCPW to test |
| 2 | TRANSMITTER | | |
| 2.1 | Power | 1 to 50W Or 50 to 100 W (User Selectable) | User/ DCPW to test |
| 2.2 | FM Hum & Noise | -40 dB or better | User/ DCPW to test |
| 2.3 | Adjacent channel power | -60 dBc or better | User/ DCPW to test |
| 2.4 | Audio Response | +1, -3dB | User/ DCPW to test |
| 2.5 | Modulation | Inbound: HCPM (TDMA) | User/ DCPW to test |
| | | Outbound: HDQPSK (TDMA) | |
| 3 | RECEIVER | | |
| 3.1 | Sensitivity (Analog) | 0.30 μV at 12db SINAD or better | User/ DCPW to test |
| 3.2 | Sensitivity (Digital) | 0.30μV at 5% BER or better | User/ DCPW to test |
| 3.3 | Inter-modulation | 70dB or better | OEM Certification |
| | rejection | | supported by International |
| | | | Recognised Laboratory |
| 3.4 | Adjacent Channel | ≥ 65dB @ 12.5 KHz | User/ DCPW to test |
| | Selectivity | | |
| 4 | Antenna System | | |

APCO-II Radios

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| 4.1 | Separate antenna system for Tx and R 10dBi or better for Tx (1+1) and Rx. | Separate antenna system for Tx and Rx which shall include High Gain antenna system Minimum 10dBi or better for Tx (1+1) and Rx . |
|----------|---|---|
| 4.2 | Surge protecting devices in RF cables | ables |
| Ŋ | CHANNEL UNIT: | |
| 5.1 | Shall be Modular/Expandable. | |
| 5.2 | Each channel should be config | Each channel should be configurable to traffic and control unit and vice-versa. |
| 6 | AIR INTERFACE STANDA | AIR INTERFACE STANDARDS: Shall be open Standards APCO P25 Phase-II |
| 7 | BASE STATION to BASE STATION For inter cell traffic communications. | BASE STATION to BASE STATION AND MASTER STATION CONTROL INTERFACE: For inter cell traffic communication with microwave, optical fibre or PSTN Leased line |
| | independently. | |
| ∞ | ENVIRONMENTAL | |
| 8.1 | Operating Temperature | -30°Cto+55°C |
| | , | |
| 8.2 | Storage Temperature | -40°Cto+70°C |
| 8.3 | Humidity | 95% Max. at +40° C non-condensing |

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B. MASTER CONTROL UNIT:

ESSENTIAL FEATURES:

| | T | Trial Directives |
|---------|---|---------------------|
| SI. No. | SPECIFICATIONS | |
| | | User/ DCPW to test |
| | | User/ DCPW to test |
| 1.2 | ary suo systems, mosesses | TODAY to tot |
| | | User/ DCP w to test |
| 1.3 | High availability failover mechanism to switch from relative failure and network failure. | Hear/ DCPW to test |
| | | User/ DCPW to test |
| 4.1 | | User/ DCPW to test |
| 1 6 | 6 nos. | User/ DCPW to test |
| 4 | clude mobile/static/portable radio | User/ DCPW to test |
| S | | User/ DCPW to test |
| 6 | s – 50 | |
| 7 | 2 Nos. Or more as per user requirements | User/ DCPW to test |
| 7.1 | a) Individual calls, group calls, all calls, broadcast calls, emergency calls and patched group calls. | |
| | b) Data services like status, 323 and 132 and | |
| | | |
| | The Dispatch console shall maintain call and activity log for audit. | |
| | | |
| | | |
| | | |

APCO-II Radios

| | 8.5 | 8.4 | 8.3 | | | 8.3 | 8.2 | | | | | | 8.1 | ∞ |
|--|---|---|--|--|---|--|--|---|---|--|---|---|--|--------------------|
| b) In case of Base Station failure, the user terminals should operate in Fail Soft Mode. | Fault Tolerance: a) In case of failure in network, isolated site shall be switched to single site Trunking mode at | Late Entry: Shall support to Group calls. | Scanning: Shall support talk group scan, priority scan | d) Status, short data messages e) Packet data transfer facility for customized application f) Shall support AVLS | Non Voice calls / data calls: a) Inhibit / uninhibit | Voice Call Type: Group call, individual calls, emergency calls, Broadcast calls. | Fault management: To monitor and to display the status and status makes of a component and should also perform diagnostics when needed | f) The call processing shall not affected by failure of network management system learning. | e) The NMT shall provide user friendly GUI to the NMS administrator and operators with pull-down menu, function keys, online help screens, windows, color pictures and statistical graphs for easy operation and interpretation of information. | alarm indication. d) NMT should display real time channel activity and store activity logging of system | c) The NMT shall provide map of the equipment in the network, such as switch controllers, radio base stations, servers and work stations etc. in Trunked Radio System with status and | b) NMT shall be equipped with all necessary sub-systems/ modules and installed with necessary | Network environment and should have not standary | _ |
| | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | User/DCPW to test | | User/ DCPW to test | | | | | | User/ DCPW to test |

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THE YEAR

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To Home

OPTIONAL FEATURES:

| D-II Radios A D- To M SHAIN | Resource symbols shall be able to be automatically placed on the map display at the location as reported from Automatic Vehicle Location. For the continuous streaming of coordinates, the system shall be able to continuously update the vehicle symbol as the coordinates are received | 11.4 Map Grid: Shall be capable of continuously reporting one or more of the references (to the Dispatcher's screen) as the Dispatcher moves the cursor: Latitude | c. Address ranges.d. Database information associated with a graphic symbol. | 11.3 Map Query : Shall undertakes a number of queries based upon specific map features to determine: a. Street/road and cross-street/road names. | 11.2 Shall be capable of locating and displaying geographical information using defined | 11.1 Shall be capable of displaying a map with the geo-code at the centre of the map and at a predefined scale based on a predefined display screen rules. | | 11 AVI.S. GIS INTERFACE FOR CALL TAKING AND DISPATCHING | k) The system should have minimum 100 TB of storage capacity and should expandable | | i) Digital call recorder shall support Encryption. | - | g) Provision to search records, replay the voice conversations, back-up and should to be built-in-suitable GUI, application shall be provided. | PTT ID, Group ID, etc | f) Calls through conventional analog FM gateway with its metadata, ie Date, time, duration, | d) Individual call recording with facility to disable this feature. e) Telephone call through telephone gateway | c) Calls to and from Dispatch console and subscriber radios. | b) Group call within subscriber radios | a) Minimum 16 Nos. of Channel and should be modularly expandab | 10.1 The Voice Recording System shall support: | 10 Voice Recording System: |
|------------------------------|---|--|--|--|---|--|---------------------|---|--|-------------------------|--|------------------------|--|-----------------------|---|--|--|--|--|--|----------------------------|
| 3/3 | lisplay at the location as ing of coordinates, the coordinates are received | of the following grid Latitude and longitude. | | p features to determine: | g defined attribute type | the map display window | ures: | | nd should be modularly | recovery) site recorder | | ate/ Time criteria etc | up and restore facility | | e Date, time, duration, | | | | pandable as per the | | |
| To Co | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | Oser/ DCr w to test | Illow DCDW to toot | | | | | | | | | | | | User/ DCPW to test | Trial Directives |
| The a | | | | | | | | | | | | | | | | | | | | | |

APCO-II Radios

| from the Automatic Vehicle Location | 11.6 The incident and resource symbols should automatically updated as the status-changes. | 12 Health Status: Health Status of Ker |
|--|--|--|
| from the Automatic Vehicle Location (AVL). User/ DCPW to test | changes. | Health Status: Health Status of Remote radio Should by arminer |
| User/ DCPW to tes | User/ DCPW to test | |

| 2.3 FM Hum & Noise Adjacent Channel Power | 2.2 Digital Modulation | 2 TRANSMITTER 2.1 RF Power Output | 1.14 Interoperability with minimum two vendors | 1.10 Frequency Stability 1.11 Display 1.12 VSWR 1.12 Drotection | 1.9 Battery Capacity | | 1.5 Emission 1.6 Number of Channel 1.7 Channel Spacing | 1.3 TDMA 1.4 Operation Modes | | S.I. No. SPECIFICATIONS 1 GENERAL 1 Frequency Range | C. DIGITAL HANDHELD RADIO: |
|---|--|---|--|---|--|--|--|---|--|---|----------------------------|
| 1 | Inbound: HCPM (1DMA) Outbound: HDQPSK (TDMA) An AB or better at 12.5 KHz | 4W for 400 MHz Band (programmable) 3W for 800 MHz Band (programmable) | APCO Association | Alphanumeric Better than 1.5 Better than 1.5 Reverse Polarity and High VSWR Reverse Polarity and Technical Working Group (TWG) of the | capacity. Bidder to specify the specific voltage | 1000 or better 1000 or better 1000 or better 1000 or better | 1000 or better 12.5 kHz | 2 – Slot APCO P25 Phase II 9K80D7W. | 10 MHz for 400 MHz Band 45 MHz for 800 MHz Band | 400 MHz Band OR 800 MHz Band | |
| 2X | User/ DCPW to test User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test User/ DCPW to test | User/ DCPW to test | User/ DCPW to test User/ DCPW to test | Trial Directives |

APCO-II Radios

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Adjacent Channel Power

| MIL-STD -810 F/G | Low Pressure | 5.9 |
|-----------------------------------|------------------------------|-----|
| MIL-STD -810 F/G | Rain | 5.8 |
| MIL-STD -810 F/G | Salt | 5.7 |
| MIL-STD -810 F/G & IP-67 | Water intrusion & Dust | 5.6 |
| MIL-STD -810 F/G | Shock & Drop | 5.5 |
| MIL-STD -810 F/G | Vibration | 5.4 |
| 95% Max. at +20° C non-condensing | Humidity | 5.3 |
| -40°Cto+70°C | Storage Temperature | 5.2 |
| | | |
| -30°Cto+55°C | Operating Temperature | 5.1 |
| | ENVIRONMENTAL | SI |
| < 10 Meter | Horizontal accuracy | 4.3 |
| < 20 Second | Time to first fix hot Start | 4.2 |
| <2 Minutes | Time to first fix cold Start | 4.1 |
| | GPS | 4 |
| Less than 3% | Audio Distortion | 3.6 |
| Minimum 500m W | Audio Output | 3.5 |
| | | |
| 70dB or better | Inter-modulation | 3.4 |
| | Selectivity | |
| 60dB or better at 12.5 KHz | Adjacent Chanel | 3.3 |
| 0.30μV at 5% BER or better | Sensitivity (digital) | 3.2 |
| 0.30μV (12dB SINAD)or better | Sensitivity (Analog) | 3.1 |
| | RECEIVER | w |
| AMBE +2 (Dual Rate) | Digital Vocoder | 2.6 |
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| Datton: Charger | T | |
|---------------------------------------|--|---------------------|
| Ballery Charge | | User/ DCPW to test |
| | OEM / Vandor) | User/ DCPW to test |
| že . | As per battery pack (Information will be provided by OLIVI / VEHECL) | User/ DCPW to test |
| Charger Li-I | | User/ DCPW to test |
| | tion | |
| | | User/ DCPW to test |
| Indication Visual Indication | Visual Indication for all modes of charging status | User/ DCPW to test |
| Time | | |
| | to 3 hrs | User/ DCPW to test |
| No. of charging pockets 1/2/6 (Vendor | | User/ DCPW to test |
| | The offered sets should be compatible with minimum any or the two or minimum | |
| nal) variants | | |
| 1. Bone Conduction | duction | |
| 2. Ear Plug | | |
| 3. Headphone, etc | e, etc | User/ DCPW to test |
| Programming Kit All necessary So | All necessary Software and Hardware required for programming or most. | |
| | One good quality leather case with belt clip and shoulder strap. | User/ DCr w to test |
| | Two I i-ion or Li-poly batteries with each radio sets. | User/ DCDW/ to test |
| iciy | a) User manual with each radio sets should be provided tree of cost in soil | OSEI/ DCI W 10 1030 |
| Literature as well as | as well as hard copy. | |
| b) Technica PCB lay | Technical repairing manual, with complete block diagram, circuit layou, PCB layout, component & wiring diagram etc should be provided as per | |

D. DIGITAL MOBILE RADIO :

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| User/ DCPW to test | AMBE +2 (Dual Rate) | Digital Vocoder | 2.6 |
|--------------------|--|--------------------------|------|
| User/ DCPW to test | +1,-3dB | Audio Response | 2.5 |
| User/ DCPW to test | -60 dBc or better at 12.5 KHz | Adjacent Channel Power | 2.4 |
| User/ DCPW to test | -40 dB or better at 12.5 KHz | FM Hum & Noise | 2.3 |
| | Outbound: HDQPSK (TDMA) | | |
| User/ DCPW to test | Inbound: HCPM (TDMA) | Digital Modulation | 2.2 |
| User/ DCPW to test | Minimum 25 W for all bands | RF Power Output | 2.1 |
| | | TRANSMITTER | 2 |
| | Association | minimum two vendors | |
| User/ DCPW to test | IOP Certification from Technical Working Group (TWG) of the APCO | Interoperability with | 1.13 |
| User/ DCPW to test | Reverse Polarity and High VSWR | Protection | 1.12 |
| User/ DCPW to test | Better than 1.5 | VSWR | 1.11 |
| User/ DCPW to test | Alphanumeric | Display | 1.10 |
| User/ DCPW to test | ±1.5 PPM or better | Frequency Stability | 1.9 |
| User/ DCPW to test | 11.25 VDC | Operating Voltage | 1.8 |
| | | numbers) | |
| | | (individual / group call | |
| User/ DCPW to test | 1000 or better | Number of contacts | 1.7 |
| User/ DCPW to test | 12.5 kHz | Channel Spacing | 1.6 |
| User/ DCPW to test | 1000 or better | Number of Channel | 1.5 |
| User/ DCPW to test | 9K80D7W | Emission | 1.7 |
| User/ DCPW to test | APCO P25 Phase II | Operation Modes | 1.4 |
| User/ DCPW to test | 2-Slot | TDMA | 1.3 |
| | 45 MHz for 800 MHz Band | | |
| User/ DCPW to test | 10 MHz for 400 MHz Band | Duplex Spacing | 1.2 |
| User/ DCPW to test | 400 MHz Band OR 800 MHz Band | Frequency Range | 1.1 |
| | | GENERAL | 1 |
| | | | No. |
| Trial Directives | | SPECIFICATIONS | SI |
| | | | |

APCO-II Radios

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| 5.9 | 5.8 | 5.7 | 5.6 | 5.5 | 5.4 | 5.3 | 5.2 | | 5.1 | 2 | 4.3 | 4.2 | | 4.1 | 4 | 3.6 | 3.5 | | | در 4 | | | 3.2 | | သ |
|------------------|------------------|------------------|--------------------------|------------------|------------------|-----------------------------------|---------------------|--|-----------------------|---------------|---------------------|-----------------------------|-------|------------------------|-----|--------------------|--------------------|-----------------------|----------------------------|-------------------|-------------|----------------------------|----------------------------|-------------------------------|----------|
| Low Pressure | Rain | Salt | Water intrusion & Dust | Shock & Drop | Vibration | Humidity | Storage Temperature | | Operating Temperature | ENVIRONMENTAL | Horizontal accuracy | Time to first fix hot Start | Start | Time to first fix cold | GPS | Audio Distortion | Audio Output | | TITOM | Inter-modulation | Selectivity | Adjacent Chanel | Sensitivity (Digital) | Sensitivity (Analog) | RECEIVER |
| MIL-STD -810 F/G | MIL-STD -810 F/G | MIL-STD -810 F/G | MIL-STD -810 F/G & IP-54 | MIL-STD -810 F/G | MIL-STD -810 F/G | 95% Max. at +20° C non-condensing | -40°Cto+70°C | | -30°Cto+55°C | | < 10 Meter | < 20 Second | | <2 Minutes | | Less than 3% | Minimum 3 W | | | 70dB or better | | 60dB or better at 12.5 KHz | 0.30μV at 5% BER or better | 0.30μV (12dB SINAD)or better | |
| | | | | | | | | supported by International Recognised Laboratory | OEM Certification | | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | Recognised Laboratory | supported by International | OEM Certification | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | |

Note:1. The Technical Specifications & Trial Directives may be used for procurement as per the applicable GFR or State Financial Rules.

Technical Specifications may slightly be modified by user organisations for specific requirement, if any, with the approval of competent

authority.

APCO-II Radios

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3. If required, submitted OEM Certificates results may be verified from the available certified laboratories, 2. User Organisations may ask the vendors for lifetime support for supplied Software updates / patches, Warranty and Spare support as per the need

Deputy Superintendent of Police, Deputy Director, Haryana Police Prem Dangi) **DCPW** Assistant Commissioner of Police, Deputy Commissioner of Police, (Amar Singh Meena) (Balkrishna Yadav) Mumbai Police Delhi Police (D. Mukhopadhyay) Deputy Director Joint Director, DCPW **DCPW** 527.7,17 Deputy Inspector General, Andhra Pradesh Police Deputy Commandant, CRPF (N S J Lakshmi) (PRJha)

(Devendra Singh) Additional Director,

DCPW

ORS of RADIO TRUNKING SYSTEM - TETRA Technology

| | 4.2 | 4.1 | | 3.4 | | 3.3 | | | | 2.5 | | | | | | | | | | | 1 4 Fre | 1.3 Te | 1.2 | \perp | SI No. GE | COECIEICATIONS | A. BASE STA | |
|------|--------------------------------|--------------------------------|--|------------------------------|--------------------|-----------------------------|----------------------------|----------------------------|---------------------------------|------------------|------------|--------------------|------------------------|--------------------|--------------------|--------------------|--|--------------------|-------------------|--------------------|---------------------|--------------------|-------------------------|-------------------------|--------------------|----------------|--------------------------|--|
| | Surge protecting devices in Kr | or better for Tx (1+1) and Rx. | Antenna System On The System for T. | Adjacent Channel Selectivity | | Inter-Inountation reference | ensilivity (Digital) | Sensitivity (Digital) | Sensitivity (Analog) | Modulation | I dilation | Audio Response | Adjacent channel power | FM Hum & Noise | Power | TRANSMITTER | Vocoder | Power Supply | Emission | Channel Spacing | Frequency Stability | Technology | Dupies opaciiis | Frequency Range | GENERAL | SNOT | BASE STATION UNIT (BSU): | |
| | Capies | | Antenna System Concrete antenna system for Tx and Rx which shall include High Gain antenna system Minimum 10dB1 | > 65dB @ 12.5 KHZ | | | 70dB or better | 0.30μV at 5% BER or better | 0.30 μV at 12db SINAD or better | | π/4-QDPSK | +1, -3dB | -60 dBc or better | -40 dB or better | 2010 TOO W | | ACELP | 230 V ± 10% 30 11Z | 21K0D1W | 25 KHz | ±0.5 PPM or better | TETRA Standard | 45 MHz for 800 MHz Band | 10 MHz for 400 MHz Band | | | | |
| Si X | | User/ DCPW to test | 0dBi User/ DCr w to test | + | User/ DCPW to test | Recognised Laboratory | supported by International | OEM Certification | User/ DCPW to test | Her/DCPW to test | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | The state of the s | User/ DCPW to test | User/DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | TRIAL DIRECTIVES | |

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5.2

Shall be Modular/Expandable.

AIR INTERFACE STANDARDS: Shall be open Standards TETRA

Each channel should be configurable to traffic and control unit and vice-versa.

CHANNEL UNIT:

8.1

Operating Temperature

-30°C

to

+55°C

ENVIRONMENTAL

inter cell traffic communication with microwave, optical fibre or PSTN Leased line independently.

BASE STATION to BASE STATION AND MASTER STATION CONTROL INTERFACE: For

User/ DCPW to test

supported by International

OEM Certification

Recognised Laboratory

supported by International

Recognised Laboratory

OEM Certification

User/ DCPW to test

User/ DCPW to test

8.4 8.3

Vibration, Shock, Water

MIL-STD-910 F/G

95% Max. at +40° C non-condensing

-40°Cto+70°C

intrusion & Dust

Humidity

Storage Temperature

De ofte

4 QRs of RADIO TRUNKING SYSTEM - TETRA Technology

B. MASTER CONTROL UNIT:

ESSENTIAL FEATURES:

| | | | 7.1 | 7 | 6 | | 5 | 4 | ω | 2 | 1.4 | 1.3 | 1.2 | | | S.I. No. |
|------|--|---|---|--|---------------------------------|-----------------|---|--|---|---|--|---|---|--------------------|---------------------|------------------|
| | The Dispatch console shall have Kadio enable and disable/Stunun-stun facility. e) The Dispatch console shall maintain call and activity log for audit f) No call failure | a) Individual calls, group calls, all calls, broadcast calls, emergency calls and patched group calls.b) Data services like status, SDS and free form text messaging | The Dispatcher Console shall be able to handle: | Dispatcher Console: Minimum 2 Nos. Or more as per user requirement | Minimum No. of talk groups – 50 | and gateway etc | Minimum Radio terminal supported - 2000 which will include mobile/static/portable radio dispatchers | Network should support at least 125 Carriers | Minimum No. of Carriers Station sites supported - 03 nos. | Minimum No. of Base Station supported - 10 nos. | Data base shall be mirrored in both the hot standby. | High availability failover mechanism to switch from primary to secondary switch/controller and vise-versa for hardware failure, software failure and network failure. | Shall be equipped with all necessary sub systems/ modules and one time licensed system software as required for whole life. | • | Switching System | SPECIFICATIONS |
| 5400 | | | User/ DCPW to test | | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | Cool DOL II to too | Hear/ DCDW/ to test | Trial Directives |

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| | Network Management Terminal (NMT) | |
|---------------|---|--------------------|
| 8.1 | a) NMT shall work in closed captive Network environment and should have hot standby | User/ DCPW to test |
| | redundancy b) NMT shall be equipped with all necessary sub-systems/ modules and installed with necessary | |
| | licensed software. c) The NMT shall provide man of the equipment in the network such as switch controllers radio | |
| | base stations, servers and work stations etc. in Trunked Radio System with status and alarm | |
| | indication. | |
| | d) NMT should display real time channel activity and store activity logging of system components. | |
| | e) The NMT shall provide user friendly GUI to the NMS administrator and operators with pull-down | |
| | menu, function keys, online help screens, windows, color pictures and statistical graphs for easy | |
| | operation and interpretation of information. | |
| | f) The call processing shall not affected by failure of network management system/ terminal. | |
| 8.2 | Fault management: To monitor and to display the status and status history of a system component | User/ DCPW to test |
| | aria sironia aiso berrottii aragitosties miteli lieeaea | |
| <u>«</u> ن | Voice Call Type: Group call, individual calls, emergency calls, Broadcast calls. Non Voice calls / data calls: | User/ DCPW to test |
| | a) Inhibit / Uninhibit | |
| | b) Authentication registration | |
| | c) Location information transfer | |
| | d) Status, short data messages | |
| | e) Packet data transfer facility for customized application | |
| | f) Shall support AVLS | |
| 8 .3 | Scanning: Shall support talk group scan, priority scan | User/ DCPW to test |
| 8.4 | Late Entry: Shall support to Group calls. | User/ DCPW to test |
| 8.5 | Fault Tolerance: | User/ DCPW to test |
| | a) In case of failure in network, isolated site shall be switched to single site Trunking mode at that | |
| | time | |
| | b) In case of Base Station failure, the user terminals should operate in Fail Soft Mode. | |
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|---|---|--|--|---|---|---|--|
| Security management: a) System should support multiple number of network management user accounts. b) Access rights to the various network management applications. c) Multiple levels of access rights to users for performing tasks with these applications. The security management feature shall have the capability of allowing the establishment of authorized log-on names and passwords to the NMS. | Performance management : The performance feature shall have the capability to monitor, control and optimize the utilization of system resources. | Accounting management: The accounting management feature shall have the capability of tracking the activity of radio users on the system and allow the customer to produce reports about the traffic on the system. | Remote Killing: Provision to kill or disable the Radio remotely, | Maintenance: license for OS, application, recovery software and database backup features. | System Management Features: a) Transmission Trunking b) Subscriber unit registration/ de-registration c) Group call with late entry, talk group ID | a) Add/remove multiple subscribers b) Customize call type permissions c) Add/remove multiple talk groups d) Add a broadcast call group e) Add a system call group | Subscriber Management Features: Add/remove subscribers |
| User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test |

TETRA Radios

OPTIONAL FEATURES:

| 10 | Voice Recording System: | |
|------|---|--------------------|
| 10.1 | The Voice Recording System shall support: a) Minimum 16 Nos. of Channel and should be modularly expandable as per the user | User/ DCPW to test |
| | requirement | |
| | c) Calls to and from Dispatch console and subscriber radios. | |
| | d) Individual call recording with facility to disable this feature. | |
| | e) Telephone call through telephone gateway | |
| | f) Calls through conventional analog FM gateway with its metadata, ie Date, time, duration, PTT | |
| | ID, Group ID, etc | |
| | g) Provision to search records, replay the voice conversations, back-up and restore facility | |
| | should to be built-in-suitable GUI, application shall be provided. | |
| | h) Calls can be located and replay by radio I/D, talk group, I/D, Alias, date/ Time criteria etc | |
| | i) Digital call recorder shall support Encryption. | |
| | j) Data should be recorded in main site and other (fall back/Disaster recovery) site recorder | |
| | simultaneously. | |
| | a) The system should have minimum 100 TB of storage capacity and should be modularly | |
| | expandable | |
| 11 | AVLS: GIS INTERFACE FOR CALL-TAKING AND DISPATCHING | User/ DCPW to test |
| | The AVLS System should be capable of providing the following basic features: | |
| 11,1 | Shall be capable of displaying a map with the geo-code at the centre of the map display window and at | User/ DCPW to test |
| | a predefined scale based on a predefined display screen rules. | |
| 11.2 | Shall be capable of locating and displaying geographical information using defined attribute type | User/ DCPW to test |
| 11.3 | Map Query: Shall undertakes a number of queries based upon specific map features to determine: | User/ DCPW to test |
| | a. Street/road and cross-street/road names. | |
| | b. Co-ordinate positions. | |
| | c. Address ranges. | |
| | d. Database information associated with a graphic symbol. | |
| 11.4 | Map Grid: Shall be capable of continuously reporting one or more of the following grid references (to | User/ DCPW to test |
| | the Dispatcher's screen) as the Dispatcher moves the cursor: Latitude and longitude. | |
| 11.5 | Resource symbols shall be able to be automatically placed on the map display at the location as | User/ DCPW to test |

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|---|--|---------------------------|
| The above equipments may be procured as per GFR-2017. | Health Status: Health Status of Remote radio should be available in NMS. | oded and have that colour |
| | User/ DCPW to test | User/ DCPW to test |
| | | |

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shall be able to continuously update the vehicle symbol as the coordinates are received from the reported from Automatic Vehicle Location. For the continuous streaming of coordinates, the system

Automatic Vehicle Location (AVL).

ORs of RADIO TRUNKING SYSTEM - TETRA Technology

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C. DIGITAL HANDHELD RADIO:

| | , | | |
|----------------------|--|-----------------------------------|----------|
| User/ DCPW to test | -60 dBc or better at 25 KHz | Adjacent Channel Power | 2.5 |
| User/ DCPW to test | -40 dB or better at 25 KHz | FM Hum & Noise | 2.4 |
| User/ DCPW to test | π/4-QDPSK | Digital Modulation | 2.2 |
| User/ DCPW to test | 1 W or better | RF Power Output | 2.1 |
| | | TRANSMITTER | 2 |
| | Association | minimum two vendors | |
| User/ DCPW to test | IOP Certification from Technical Working Group (TWG) of the TETRA | Interoperability with | 1.13 |
| User/ DCPW to test | Reverse Polarity and High VSWR | Protection | 1.12 |
| User/ DCPW to test | Better than 1.5 | VSWR | 1.11 |
| User/ DCPW to test | Alphanumeric | Display | 1.10 |
| User/ DCPW to test | ±1.5 PPM or better | Frequency Stability | 1.9 |
| Osen DCF w to test | capacity. Bidder to specify the specific voltage | Dattery Capacity | 1.0 |
| II Com/ DCDW to toot | I : ion/I : Boly rechargookle bettern of canonity 2000 on Ah on higher | Battary Canacity | 1 × |
| | 1000 or better | (individual / group call numbers) | |
| User/ DCPW to test | 9.0 | Number of contacts | 1.7 |
| User/ DCPW to test | 25 kHz | Channel Spacing | 1.6 |
| User/ DCPW to test | 1000 or better | Number of Channel | 1.5 |
| User/ DCPW to test | 21K0D1W | Emission | 1.7 |
| User/ DCPW to test | TETRA Standard | Operation Modes | 1.4 |
| | TETRA Standard | | |
| User/ DCPW to test | 4-Slot | TDMA | 1.3 |
| | 45 MHz for 800 MHz Band | | |
| User/ DCPW to test | 10 MHz for 400 MHz Band | Duplex Spacing | 1.2 |
| User/ DCPW test | 400 MHz Band OR 800 MHz Band | Frequency Range | 1.1 |
| | | GENERAL | 1 |
| Trial Directives | | o. SPECIFICATIONS | S.I. No. |
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|-----------------|------------------|------------------|--------------------------|------------------|------------------|-----------------------------------|---------------------|-----------------------|-----------------------|---------------|---------------------|-----------------------------|------------------------------|-----|--------------------|--------------------|-----------------------|-------------------|-----------------------------|----------------------------|-------------------------------|----------|--------------------|--------------------|
| Low Pressure | Rain | Salt | Water intrusion & Dust | Shock & Drop | Vibration | Humidity | Storage Temperature | | Operating Temperature | ENVIRONMENTAL | Horizontal accuracy | Time to first fix hot Start | Time to first fix cold Start | GPS | Audio Distortion | Audio Output | | IIIOanianon | Adjacent Chanel Selectivity | Sensitivity (Digital) | Sensitivity (Analog) | RECEIVER | Digital Vocoder | Audio Nesponse |
| MIL-STD-810 F/G | MIL-STD -810 F/G | MIL-STD -810 F/G | MIL-STD -810 F/G & IP-67 | MIL-STD -810 F/G | MIL-STD -810 F/G | 95% Max. at +20° C non-condensing | -40°Cto+70°C | | -30°Cto+55°C | | < 10 Meter | < 20 Second | <2 Minutes | | Less than 3% | Minimum 500m W | | /Odb of better | 60dB or better at 25 KHz | 0.30μV at 5% BER or better | 0.30μV (12dB SINAD)or better | | ACELP | +1,-30B |
| | | | | | | | | Recognised Laboratory | OEM Certification | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | Recognised Laboratory | OEM Certification | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test |

23) CEX

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| CCESSORIES | | |
|--------------------------|---|--------------------|
| Battery Charger | | |
| Input Voltage | 230V + 10%, 50 Hz | User/ DCPW to test |
| Output Voltage | As per battery pack (Information will be provided by OEM / Vendor) | User/ DCPW to test |
| Type of Battery Charger | Li-Ion / Li-poly | User/ DCPW to test |
| Protection | 1. Reverse Polarity Protection | User/ DCPW to test |
| | 2. Short Circuit Protection | |
| Indication | Visual Indication for all modes of charging status | User/ DCPW to test |
| Charging Time | Standard Charger – 6 to 14 hrs | User/ DCPW to test |
| | Rapid Charger – 1 to 3 hrs | |
| No. of charging pockets | 1/2/6 (Vendor to quote accordingly) | User/ DCPW to test |
| Hands free Kit (VOX unit | The offered sets should be compatible with minimum any of the two or more | User/ DCPW to test |
| with PTT)(Optional) | variants | |
| | 1. Bone Conduction | |
| | 2. Ear Plug | |
| | 3. Headphone, etc | |
| Programming Kit | All necessary Software and Hardware required for programming of the set | User/ DCPW to test |
| | independently for lifelong support with regular updates. | 3 |
| Leather Case | One good quality leather case with belt clip and shoulder strap. | User/ DCPW to test |
| No. of Battery | Two Li-ion or Li-poly batteries with each radio sets. | User/ DCPW to test |
| Literature | a) User manual with each radio sets should be provided free of cost in soft | User/ DCPW to test |
| | as well as hard copy. | |
| | b) Technical repairing manual, with complete block diagram, circuit | |
| | layout, PCB layout, component & wiring diagram etc should be | |
| | provided as per user's requirement in soft as well as hard copy. | |

QRs of RADIO TRUNKING SYSTEM - TETRA Technology

D. DIGITAL MOBILE RADIO:

| | | lios | TETRA Radios |
|---------------------|---|--------------------------|--------------|
| User/ DCPW to test | ACELP | Digital Vocoder | 2.7 |
| User/ DCPW to test | +1,-3dB | Audio Response | 2.6 |
| User/ DCPW to test | -60 dBc or better at 25 KHz | Adjacent Channel Power | 2.5 |
| User/ DCPW to test | -40 dB or better at 25 KHz | FM Hum & Noise | 2.4 |
| User/ DCPW to test | ±2.5 kHz at 25 kHz | Modulation Deviation | 2.3 |
| User/ DCPW to test | π/4QDPSK | Digital Modulation | 2.2 |
| User/ DCPW to test | Minimum 25 W for all bands | RF Power Output | 2.1 |
| | | TRANSMITTER | 2 |
| | TETRA Association | minimum two vendors | |
| User/ DCPW to test | IOP Certification from Technical Working Group (TWG) of the | Interoperability with | 1.13 |
| User/ DCPW to test | Reverse Polarity and High VSWR | Protection | 1.12 |
| User/ DCPW to test | Better than 1.5 | VSWR | 1.11 |
| User/ DCPW to test | Alphanumeric | Display | 1.10 |
| User/ DCPW to test | ±1.5 PPM or better | Frequency Stability | 1.9 |
| User/ DCPW to test | 11.25 VDC | Operating Voltage | 1.8 |
| | | numbers) | |
| Cach DCI W to test | 1000 or better | (individual / group call | |
| Hear/DCDW to test | | Number of contacts | 1.7 |
| User/ DCPW to test | 25 kHz | Channel Spacing | 1.6 |
| User/ DCPW to test | 1000 or better | Number of Channel | 1.5 |
| User/ DCPW to test | 21K0D1W | Emission | 1.7 |
| User/ DCPW to test | TETRA Standard | Operation Modes | 1.4 |
| User/ DCPW to test | 4 – Slot TETRA Standard | TDMA | 1.3 |
| | 45 MHz for 800 MHz Band | | |
| I ser/ DCPW to test |) MHz Ban | Duplex Spacing | 1.2 |
| User/ DCPW to test | 400 MHz Band OR 800 MHz Band | Frequency Range | 1.1 |
| | | GENERAL | 1 |
| Trial Directives | | SPECIFICATIONS | S.I. No. |
| | | | |

TETRA Radios

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| 5.9 | 5.8 | 5.7 | 5.6 | 5.5 | 5.4 | 5.3 | 5.2 | | 3 | 5.1 | S | 4.3 | 4.2 | 4.1 | 4 | 3.6 | 3.5 | | | 3.4 | ယ | 3.2 | 3.1 | 3 | 3 |
|------------------|------------------|------------------|--------------------------|------------------|------------------|-----------------------------------|---------------------|-----------------------|----------------------------|-----------------------|---------------|---------------------|-----------------------------|------------------------------|-----|--------------------|--------------------|-----------------------|----------------------------|-------------------|-----------------------------|-----------------------------|----------------------------|---------------------------------------|---------|
| Low Pressure | Rain | Salt | Water intrusion & Dust | Shock & Drop | Vibration | Humidity | Storage Temperature | | , | Operating Temperature | ENVIRONMENTAL | Horizontal accuracy | Time to first fix hot Start | Time to first fix cold Start | GPS | Audio Distortion | Audio Output | | i | Inter-modulation | Adjacent Chanel Selectivity | Sensitivity (Digital) | Sensitivity (Analog) | KECEIVEK | DECEMBE |
| MIL-STD -810 F/G | MIL-STD -810 F/G | MIL-STD -810 F/G | MIL-STD -810 F/G & IP-54 | MIL-STD -810 F/G | MIL-STD -810 F/G | 95% Max. at +20° C non-condensing | -40°Cto+70°C | | | -30°Cto+55°C | | < 10 Meter | < 20 Second | <2 Minutes | | Less than 3% | Minimum 3 W | | | 70dB or better | 60dB or better at 12.5 KHz | 0.30µ V at 5% BEK or better | 0.30 I CAS SINAL JOI DEUEI | O O O O O O O O O O O O O O O O O O O | |
| | | | | | | | | Recognised Laboratory | supported by International | OEM Certification | | User/ DCPW to test | User/ DCPW to test | User/ DCPW to test | | User/ DCPW to test | User/ DCPW to test | Recognised Laboratory | supported by International | OEM Certification | OseI/ DCF w to test | OSCI DOI W 10 ICSI | User/ DCBW to test | Hear/DCDW to test | |

1. The Technical Specifications & Trial Directives may be used for procurement as per the applicable GFR or State Financial Rules.

Technical Specifications may slightly be modified by user organisations for specific requirement, if any, with the approval of competent

authority.
TETRA Radios

- 2. User Organisations may ask the vendors for lifetime support for supplied Software updates / patches, Warranty and Spare support as
- 3. If required, submitted OEM Certificates results may be verified from the available certified laboratories.

per the need.

Deputy Superintendent of Police, Haryana Palice

Deputy Director, (R K Verma) **DCPW**

> Assistant Commissioner of Police, Delhi Police (Amar Singh Meena)

Deputy Commissioner of Police, (Balkrishna Yadav) Mumbai Police

Additional Director, (Devendra Singh)

DCPW

Deputy Director, DCPW (Rajesh Ekka)

(D. Mukhopadhyay Joint Director,

> Deputy Commandant, CRPF PR Jha

(N S J Lakshmi)

Deputy Inspector General, Andhra Pradesh Police

TETRA Radios