

ANNEX D TO**TENDER NO- 06.06.0000.275.07.189.23****DATED: 10 JANUARY 2024****TECHNICAL SPECIFICATION OF ITEM (DP-5)****TENDER SPECIFICATION FOR PROCUREMENT AND INSTALLATION OF 01 x DIGITAL TRUNKING SYSTEM****Introduction**

1. Bangladesh Air Force (BAF) has planned to procure **Digital Trunking System** for Dhaka area as a Turn-key project. All the repeaters/ sites will be interconnected through optical fiber to form a single network with centralized control and management system.
2. For better understanding and to evaluate all the prospective bidders on the same platform, the tender specification has been divided into three parts:
 - a. **Part-1** : General Information and bidders' Responsibility.
 - b. **Part-2** : Operational and Technical Specification (Essential and Optional Requirement).
 - c. **Part-3** : General Terms and Conditions.

PART- 1: GENERAL INFORMATION AND BIDDERS' RESPONSIBILITY**General Information**

3. Prospective bidders are to comply with all the requirements, terms and conditions mentioned in Part-1, Part-2 and Part-3 of the tender specifications. Bidders are requested to provide details explanation of the technical matters wherever necessary and cross reference to relevant pages of their offer / original supporting documents. Bidders are also to provide performance data, technical data, specific figures and information as asked against each condition.
4. In Part-2, there are essential features/items. Bidders failing to comply with essential features will be considered as disqualified.
5. Prospective bidders are to submit their following two offers in two separate envelopes:
 - a. Technical Offer
 - b. Financial Offer
6. Bidders who qualify in technical offer will only be eligible for evaluation of their financial offer. Bidders shall quote price of all main equipment (externally imported) as mentioned in Part-2 in foreign currency (US Dollar) on FOB basis. Bidders shall quote price of all locally procured equipment as mentioned in Part-2 in local currency considering existing financial regulations.

Eligibility of the Bidders

7. The Bidder/ Manufacturer must have experience of setting up a functional Digital trunking sys comprising of at least 8 interconnected repeaters sites. Necessary certificates/ testimony are to be attached with the offer. Bidders are to participate in the tender through their local agents as per the existing regulation of the Directorate General of Defence Purchase (DGDP) in Bangladesh.

Bidder's/Manufacturer's Responsibility

8. It is the responsibility of bidders/manufacturers to have valid Government Assurance Certificate that there is no restriction from the respective Government to export proposed Digital Trunking System to Bangladesh.

9. Bidders are to submit full specifications and relevant documents in English, latest brochures of proposed Digital Trunking System along with the offer. The information in the brochure needs to be self-explanatory and must support and validate the information mentioned in the tender specification. Deviation or variation of information between the brochure and formally offered documents would be treated as non-compliance.

10. Bidders are to provide performance / technical data, specific figures and information as asked against each condition of tender specification. In addition, bidders are to mention compliance/non-compliance against each condition. BAF reserves the right to reject those offers which merely mention 'Complied' / 'Agreed' without highlighting required detail information/ data/ figures/ graphs as asked against each condition.

11. Bidders may request for technical clarifications on any issue relating to the information contained in the tender specification from Air Headquarters, Directorate of Communication and Electronics in writing with an intimation to DGDP and apply to DGDP for a meeting (if felt necessary) on pre-agreed schedule from Directorate of Communication and Electronics and DGDP.

12. If principal supplier is not the manufacturer of the items, the bidder is to submit authorization certificate from manufacturer in favour of them to participate in the tender. The bidder is also to submit authorization certificate in favour of their local agent along with the offer.

Pre-bid Survey and Pre-bid Meeting

13. The bidder is to make a survey of existing resources of BAF at their own expense before submitting the offer. The bidder is also to submit a study report mentioning number of repeater along with related items (minimum 08 sites) to cover Dhaka city area (google map attached) with the offer. Bidders are to submit necessary information and bio-data including photographs and NID/passport information of the team to Air Headquarters (Directorate of Communication and Electronics) at least 03 weeks before the date of survey/meeting for arranging necessary security clearance.

Evaluation Procedure

14. The offers submitted by the bidders shall be evaluated on the basis of following elements (not in any priority order):

- a. Compliance to eligibility criteria for bidding.
- b. Compliance to the Technical Specifications and General Terms and Conditions.
- c. Performance evaluation of the offered Digital Trunking System by BAF team (if necessary).
- d. Financial competitiveness.

15. **Presentation by Bidders.** Bidders may require to give a presentation physically/through VTC at Air Headquarters if desired by BAF any time after submitting the offer at bidder's expense. In that case, bidder is to submit necessary information and bio-data including photographs and NID/passport information of the team to Air Headquarters (Directorate of Communication and Electronics) at least 03 weeks before for necessary security clearance.

16. **Additional/ Optional Features Offered by the Bidders.** The bidder may offer additional/ optional features for the system which is not mentioned in this tender schedule. In that case bidders have to explain the advantage of that/ those features of the system along with additional financial implication(if any).

17. **Alternate Offer.** Alternate offers are not accepted.

18. **Acceptance or Rejection of the Offer.** DGDP/ BAF reserves the right to accept or reject any bid or to annul the bidding process and reject all bids at any time prior to contract award (without assigning any reason to the bidders).

PART-2: OPERATIONAL AND TECHNICAL SPECIFICATIONS ESSENTIAL REQUIREMENTS**19. Key Features.**

a. Bidder must plan and install sufficient Base stations/ Repeaters (not less than 32 repeaters/ base stations and not less than 08 sites) to cover the designated area of Dhaka city (Google map attached). All the repeater sites / base stations should be connected through suitable optical fiber link that bidder will provide. A comprehensive plan with necessary technical justification and diagram is to be added with the offer.

b. The network must support the following options:

- (1) One to all call
- (2) One to group call (any logical group)
- (3) One to one call (private call)
- (4) Radio to PABX call and vice versa
- (5) Emergency group call (any logical group)
- (6) Messaging

c. Number of concurrent calls for any repeater site will not be less than 07. MSO must have the capability to handle aggregated concurrent calls.

d. Bidder must plan the equipment as per the frequencies allotted to BAF by BTRC. Bidder may propose for other suitable band also, subject to allotment from BTRC. The allotted frequency range is given below:

UHF Band: 400-470 MHz

e. Bidder will plan to maximize the utilization of existing resources like existing towers of BAF. Utilization of existing radio equipment (if possible) will be considered as an added advantage. Bidders are encouraged to make a survey of existing resources at their own expense. The towers of Govt organization i.e. Bangladesh Police, RAB etc (if any) may be planned for utilization depending on prior permission from respective organization. List of probable location are given below:

Serial Number	Location of Tower	Height	Availability of Eqpt Room	Owner
01	BAF Comm (U)	112 meters	Yes	BAF
02	C&E Sqn BBD	40 meters	Yes	BAF
03	Retreat area near Farmgate	No Tower	No	BAF
04	71 Sqn BAF	20 meters	Yes	BAF

f. The network should be of DMR Tier 3 protocol. All the radio equipment should be inter-operable with standard DMR Tier 3 equipment from other vendors. The proposed network must support future expansions to cover whole Bangladesh.

g. The network must be encrypted with AES-256 bit end to end encryption. Encryption key must be selectable by BAF.

h. The network must have facility to interface with standard digital PABX, GSM/LTE and 4G Body Camera.

j. The bidder must provide necessary air conditioners for the equipment room (Minimum 02 x 02 Ton AC for each equipment room).

k. The bidder must install necessary protection devices like lightning arresters, earthlings, groundings, surge protection devices as per requirement. Earthing resistance should be less than 1 ohm.

l. Supplier must provide all the equipment including necessary accessories, software and **license** (if required) as a full package. All the licenses must be perpetual in nature and never expired. All the updates, bug fixing, patches are to be provided by supplier throughout the service life at free of cost.

m. There should be a 'DMR Switching Station', from where position of all the mobile radios can be monitored. The radios must have built in **GPS facility**.

n. 'DMR Switching Station' must have call recording facility for at least 20 concurrent channels. The recording device/ server should have sufficient storage facility for the recorded data for at least 30 days.

p. All the repeater sites should be equipped with online UPS to provide at least 6 (six) hours back up.

20. **Technical Specification of Digital Base Stations/Repeaters with all accessories.**

Following technical specification shall be applicable for Digital Base Station/Repeater of Digital Trunking System:

a. **Brand**: To be mentioned by the bidder.

b. **Model**: To be mentioned by the bidder.

c. **Quantity**: Required number of repeater (minimum 32) for coverage of Dhaka city designated area (map attached). Detail study report including simulated coverage to be provided as per Tender Terms and Condition clause no-19.

d. **Country of origin**: USA/ Japan/ EU Countries.

e. **Country of manufacturing**: To be mentioned.

f. **VHF Frequency Range**: 136-174 MHz.

g. **UHF Frequency Range**: 400-470 MHz.

h. **Duplexer**: To be mentioned by the bidder.

j. **Antenna**: To be mentioned by the bidder.

k. **Power Module**: To be mentioned by the bidder.

l. **RF cables, connectors**: To be mentioned by the bidder.

m. **Power output**: Not less than 50 watt.

n. **All necessary accessories**: To be mentioned by the bidder.

p. **Programming kit, cables, software etc**: To be mentioned by the bidder.

q. **Necessary power supply module and power backup with online UPS**: At least 06 hours with online UPS.

r. **Receiver sensitivity**: 0.3 μ V @ BER 5% or better.

s. **Duty cycle**: To be mentioned by the bidder.

t. **Adjacent Channel Selectivity**: \geq 60 dB.

u. **Mean Time Between Failure (MTBF)**: 100,000 hours or better.

v. **Mean Time to Repair (MTTR)**: 30 minutes or less.

w. **ETSI DMR Tier 3**: Standard.

21. **Optical Fiber Link specification.** All the repeater site must be connected with atleast 2 Mbps (Layer-2 tunneling). MSO must have aggregated bandwidth. Repeater site to MSO connection must be encrypted with AES-256 bit encryption (Layer-3). Optical fiber link connectivity

is to be leased from any authorized NTTN of Bangladesh. Installation and operational cost will be borne by supplier for entire warranty period. Recurrent cost will be borne by BAF after warranty period. Bidder is to provide details of the recurrent cost (after warranty period) in the offer which will not be considered for selecting lowest bidder.

22. **Mobile/ Fixed terminals.** Following technical specification shall be applicable for Mobile/Fixed Terminal of Digital Trunking System:

a. **General.**

- (1) Quality of the proposed Fixed/Mobile radio shall be of state of the art and has to support Military Standards 810 C/D/E/F/G and IP54 or better.
- (2) The proposed Fixed/Mobile radio shall support four modes: DMR Tier3 Trunking, DMR conventional mode, analog conventional mode or equivalent modes.
- (3) The proposed Fixed/Mobile radio shall support Private call, Group call, All call and Full-duplex call (preferable) in DMR Tier3 Trunking mode.
- (4) Fixed/Mobile radio must be available with dispatching software.
- (5) The proposed Fixed/Mobile radio shall support up to 256 character SMS.
- (6) The proposed Fixed/Mobile radio should be equipped with end to end AES-256 bit encryption.
- (7) The proposed Fixed/Mobile radio must have built-in GPS module.
- (8) The proposed Fixed/Mobile radio shall support over the air programming via the network management software.
- (9) The proposed Fixed/Mobile radio shall have the capability of background noise suppression/noise cancellation/noise reduction/noise rejection to avoid missing a call in loud or noisy environment.
- (10) The proposed Fixed/Mobile radio shall support ethernet port for secondary application development.
- (11) The proposed Fixed/Mobile radio shall support connection to other Fixed/Mobile via the IP connection to realize voice call forwarding among these mobile terminals.
- (12) The proposed Fixed/Mobile radio shall support built-in bluetooth (not lower than 4.0 version) feature for wireless radio accessories connection or data transmission.
- (13) The proposed Fixed/Mobile radio shall support the radio to display caller's location after the call set-up.

b. **Fixed/Mobile Radio:** Following technical specification shall be applicable for Fixed/Mobile Radio of Digital Trunking System:

- (1) **Brand:** To be mentioned by the bidder.
- (2) **Model:** To be mentioned by the bidder.
- (3) **Quantity:** 75 (Fixed Station:35, Mobile Station:40).
- (4) **Country of origin:** USA/ Japan/ EU Countries.
- (5) **Country of manufacturing:** To be mentioned.
- (6) **UHF Frequency Range:** 400-470 MHz.
- (7) **Channel Capacity:** At least 50.
- (8) **Channel Spacing:** Analog: 25/20/12.5kHz and Digital: 12.5kHz.

- (9) Digital Protocol: TDMA (DMR Tier3 ETSI).
- (10) Modulation Analogue: FM and Digital: 4FSK or equivalent.
- (11) Weight: To be mentioned by the bidder.
- (12) LCD Display: High resolution & brightness, color LCD or better.
- (13) Operating Voltage: 13.6 V \pm 15%.

c. **Transmitter:**

- (1) Output RF Power: 25 watt or higher.
- (2) Frequency Stability: \pm 0.5 ppm or better.
- (3) Modulation Limiting: \pm 2.5/4.0/5.0kHz @ 12.5/20/25 kHz or better.
- (4) Adjacent Channel Power: 60dB@12.5kHz, 70dB@20/25kHz or better.
- (5) Audio distortion: Equal or less than 3%.
- (6) FM Noise: 40dB or better.

d. **Receiver:**

- (1) Frequency Stability: \pm 0.5 ppm or better.
- (2) Sensitivity: Analogue : 0.3 μ V for 12dB SINAD or better.
Digital: 0.3 μ V at 5% BER or better.
- (3) Adjacent Channel Selectivity: ETSI: 60dB @12.5 KHz/70dB @20/25 KHz, TIA-603: 60dB @12.5 KHz/70dB @20/25 KHz.
- (4) Spurious Rejection: 70- 90dB or better.
- (5) Inter-modulation: 65-75 dB.
- (6) Accessory for mobile radio: Antenna, GPS antenna, Handset microphone with keypad, Programming kit & Software are required.
- (7) Accessory for fixed radio: Omni-directional Antenna, 150 feet feeder cable with each radio set, power supply, short jumper with proper connector, Handset microphone with keypad, Programming kit are required.

23. **Common User Handheld terminals with covert type headset and hand PTT**: Following technical specification shall be applicable for headset and hand PTT of Digital Trunking System:

a. **General:**

- (1) Quality of the proposed walkie-talkie shall be of state of the art and has to Military Standards 810 C/D/E/F/G and IP57 water and dust proof or better.
- (2) The proposed walkie-talkie shall support four modes: DMR Tier 3 Trunking, DMR conventional mode, analog conventional mode or equivalent modes.
- (3) The proposed walkie-talkie shall support to send 256 character SMS.
- (4) The proposed walkie-talkie should be equipped with end to end AES-256 bit encryption.
- (5) The proposed walkie-talkie must have built-in GPS.
- (6) The proposed walkie-talkie shall support private call, group call, all call, Text Messages and caller ID.
- (7) The proposed walkie-talkie shall support over the air programming via the network management software.

- 11)
- (8) The proposed walkie-talkie shall have acoustic feedback suppressor that blocks audio feedback from other nearby radios to eliminate howling noise.
 - (9) The proposed Fixed/Mobile radio shall have the capability of background noise suppression/noise cancellation/noise reduction/noise rejection to avoid missing a call in loud or noisy environment.
 - (10) The radio must have a display with good resolution and brightness and must have keypad.
 - (11) The proposed Fixed/Mobile radio shall support built-in bluetooth (not lower than Bluetooth 4.0 version) feature for wireless radio accessories connection.
 - (12) The proposed Fixed/Mobile radio shall support the radio to display caller's location after the call set-up.

b. **Radio Specifications:**

- (1) Brand: To be mentioned by the bidder.
- (2) Model: To be mentioned by the bidder.
- (3) Quantity: 600.
- (4) Country of origin: USA/ Japan/ EU Countries.
- (5) Country of manufacturing: To be mentioned.
- (6) UHF Frequency Range: 400-470 MHz.
- (7) Channel Capacity: At least 100.
- (8) Channel Spacing: Analogue: 25/12.5kHz and digital:12.5kHz.
- (9) Digital Protocol: TDMA (DMR tier 3 ETSI).
- (10) Modulation: Analog FM and Digital 4FSK or Equivalent.
- (11) Standard Battery: At least 2350mAh Li-ion battery.
- (12) Charge retention time: At least 10 Hours for analogue and at least 13 Hours for digital (High TX Power).
- (13) Weight: To be mentioned, smaller in size and weight will be advantageous.
- (14) Operating Voltage: 7.4V±5% (Rated).

c. **Transmitter:**

- (1) Output RF Power: Not less than 4 Watt.
- (2) Frequency Stability: ±0.5 ppm or better.
- (3) Modulation Limiting: ±2.5/4.0/5.0kHz @ 12.5/20/25 kHz.
- (4) Adjacent Channel Power: 60dB@12.5kHz, 70dB@20/25kHz.
- (5) Audio distortion: Less than 3%.
- (6) FM Noise: 40dB or better.

d. **Receiver:**

- (1) Frequency Stability: ±0.5 ppm or better.
- (2) Sensitivity: Analogue : 0.3µV for 12dB SINAD or better.
Digital : 0.3µV at 5% BER or better.

- (3) Adjacent Channel Selectivity: 60dB@12.5kHz, 70dB@20/25kHz.
- (4) Spurious Rejection: (70- 90)dB or better.
- (5) Inter-modulation: (65-75)dB or better.
- (6) Accessory: Additional Battery/Programming Software kit (cable + disk)/ Earpieces with PTT are required which must be voice sensitive PTT. Bluetooth or any other wireless headphones will be advantageous. Bidder may mention optional price for these accessories.

24. **Executive Hand held terminals with covert type headset and hand PTT**: Following technical specification shall be applicable for Executive Hand held terminals with covert type headset and hand PTT of Digital Trunking System:

a. **General**:

- (1) Quality of the proposed walkie-talkie shall be of state of the art and has to Military Standards 810 C/D/E/F/G and IP57 water and dust proof or better.
- (2) The proposed walkie-talkie shall support four modes: DMR Tier 3 Trunking, DMR conventional mode, analog conventional mode or equivalent modes.
- (3) The proposed Fixed/Mobile radio shall support to send 256 character SMS.
- (4) The proposed walkie-talkie should be equipped with end to end AES-256 bit encryption.
- (5) The proposed walkie-talkie must have built-in GPS.
- (6) The proposed walkie-talkie shall support private call, group call, all call, Text Messages and caller ID.
- (7) The proposed walkie-talkie shall support over the air programming via the network management software.
- (8) The proposed walkie-talkie shall have acoustic feedback suppressor that blocks audio feedback from other nearby radios to eliminate howling noise.
- (9) The proposed walkie-talkie shall have the capability to adjust radio volume automatically to compensate for background noise, so the radio users don't have to adjust their radio volume to avoid missing a call on loud situation or disturbing others when they move into quiet places.
- (10) The radio must have a display with good resolution and brightness and must have keypad.
- (11) The radio must have private call option including group call facility (voice and video).
- (12) The radio must be specially designed handset and have the facility to talk over cellular network. The radio shall support automatically switch between the DMR Tier 3 trunking system and PTTtoC (push to talk over cellular) system and network preference can be configured.
- (13) The radio shall support to register with the PTTtoC (push to talk over cellular) system and DMR networks using the same ID when an individual call is initiated from DMR trunking network or cellular network.
- (14) The radio shall be equipped with high performance hardware platform with atleast 8-core 1.8GHz processor and built-in 3GB RAM and 32GB ROM and shall support dual-SIM dual-standby.

b. **Handheld Executive Radio Specifications:**

- (1) **Brand:** To be mentioned by the bidder.
- (2) **Model:** To be mentioned by the bidder.
- (3) **Quantity:** 75 sets with upgraded facilities and features which must be mentioned in the specification and brochure.
- (4) **Country of origin:** USA/ Japan/ EU Countries.
- (5) **Country of manufacturing:** To be mentioned.
- (6) **UHF Frequency Range:** 400-470 MHz.
- (7) **Channel Capacity:** At least 100.
- (8) **Channel Spacing:** Analogue: 25/12.5kHz and digital:12.5kHz.
- (9) **Digital Protocol:** TDMA (DMR tier 3 ETSI).
- (10) **Modulation:** Analog FM and Digital 4FSK or Equivalent.
- (11) **Standard Battery:** At least 3500mAh Li-ion battery.
- (12) **Charge retention time:** At least 10 Hours for analogue and at least 13 Hours for digital (High TX Power).
- (13) **Weight:** To be mentioned, smaller in size and weight will be advantageous.
- (14) **Operating Voltage:** 7.4V±5% (Rated).

c. **Transmitter:**

- (1) **Output RF Power:** Not less than 4 Watt.
- (2) **Frequency Stability:** ±0.5 ppm or better.
- (3) **Modulation Limiting:** ±2.5/4.0/5.0kHz @ 12.5/20/25 kHz.
- (4) **Adjacent Channel Power:** 60dB@12.5kHz, 70dB@20/25kHz.
- (5) **Audio distortion:** Less than 3%.
- (6) **FM Noise:** 40dB or better.

d. **Receiver:**

- (1) **Frequency Stability:** ±0.5 ppm or better.
- (2) **Sensitivity:** Analogue : 0.3µV for 12dB SINAD or better.
Digital : 0.3µV at 5% BER or better.
- (3) **Adjacent Channel Selectivity:** 60dB@12.5kHz, 70dB@20/25kHz.
- (4) **Spurious Rejection:** (70- 90)dB or better.
- (5) **Inter-modulation:** (65-75)dB or better.
- (6) **Accessory:** Additional Battery/Programming Software kit (cable + disk)/ Earpieces with PTT are required which must be voice sensitive PTT. Bluetooth or any other wireless headphones will be advantageous. Bidder may mention optional price for these accessories.

25. **Central Switching Unit/ Mobile Switching Office (MSO):** Following technical specification shall be applicable for Central Switching Unit/ Mobile Switching Office of Digital Trunking System:

a. **General:**

- (1) The offered MSO (Mobile Switch Office) should be able to support at least 60 trunking radio base stations/ repeater sites, and also can support the Multi-MSO mode for the large scale project .If multi-MSO mode is not supported, the single MSO must support at least 100 repeater sites.
- (2) The offered MSO (Mobile Switch Office) shall be logically consist of control server, central switch, router, MTU (media translating unit), and power distribution unit.
- (3) The offered MSO shall be of complete modular design and must allow customization to match capacity and performance required for this project and to provide all necessary functions to operate the system-wide trucking radio communications.
- (4) The system MSO shall be scalable to allow later network extension in capacity and coverage by adding server platforms and software licenses.
- (5) The system MSO must be enabled to remotely control the trunked site controllers within its specific area.
- (6) The server platforms of the System MSO shall use Intel® or other famous brand processors and chipset.
- (7) The offered System MSO shall be capable to provide gateway connectivity and voice trans-coding to telephony networks.
- (8) The offered System MSO shall provide at least one Voice-over-IP (VoIP) interface.
- (9) The offered MSO shall be equipped with 02 x online UPS (each UPS should have individual set of batteries). Each online UPS shall have minimum 6 (six) hours backup and capable to support entire load of MSO independently. Both online UPS must be configured as hot stand-by.

b. **Specification:**

- (1) **Brand:** To be mentioned by the bidder.
- (2) **Model:** To be mentioned by the bidder.
- (3) **Country of origin:** USA/ Japan/ EU Countries.
- (4) **Country of manufacturing:** To be mentioned.

26. **Dispatch System:** Following technical specification shall be applicable for Management and Monitoring Terminal of Digital Trunking System:

- a. **Brand:** To be mentioned by the bidder.
- b. **Model:** To be mentioned by the bidder.
- c. **Country of origin:** USA/ Japan/ EU Countries.
- d. **Country of manufacturing:** To be mentioned.
- e. It enables scientific management and effective utilization of limited resources by means of GIS and GPS, realizing reliable and intuitive dispatching service in case of emergency. The services are as :

- (1) GPS polling (idle or calling)
- (2) GPS positioning
- (3) Real-time track
- (4) Track playback
- (5) Geo-fencing alarm
- (6) Customizable data update interval for each terminal in order to save network resources and avoid congestion.
- (7) Bidder must provide a min 85 inch display (or better) and server or pc for monitoring.

27. **Recording device/ Server / Storage:** Following technical specification shall be applicable for Recording device/ Server / Storage of Digital Trunking System:

- a. **Brand:** To be mentioned by the bidder.
- b. **Model:** To be mentioned by the bidder.
- c. **Country of origin:** USA/ Japan/ EU Countries.
- d. **Country of manufacturing:** To be mentioned.
- f. At least 20 channel recorder with sufficient memory to store data at least for 30 days.

28. **Protection Devices for all sites and all equipments:**

- a. Lightning Arrester and down conductors and earthing with ground impedance less than 1 ohm.
- b. Power and equipment ground with impedance less than 1 ohm.
- c. Surge protection devices.

29. **Air conditioners for the equipment room:**

- a. **Brand:** To be mentioned by the bidder.
- b. **Model:** To be mentioned by the bidder.
- c. **Quantity:** To be mentioned by the bidder according to the study report.
- d. **Country of origin:** To be mentioned.
- e. **Country of manufacturing:** To be mentioned.
- f. At least 2 (Two), 02 ton (24000 BTU/h) Split type AC in each equipment room.

30. **Necessary cable, connectors, accessories:** As per requirement.

31. **Specifications of De-humidifier :** Following technical specification shall be applicable for the De-humidifier:

- a. Suitable de-humidifying equipment is to be provided for round the year/hour operations.
- b. The quantity shall be mentioned as per study report by the bidder for equipment room with capacity of each minimum 5 liters/hour for the Digital Trunking System.

32. **Fire-Fighting Equipment and Fire Detection System :** Automatic fire and smoke detection system with manual fire extinguishing equipment (using FM200 or similar extinguishing agent) is to be provided for the equipment of Digital Trunking System, Generator/UPS Room, Operation Room, Site Store and workshop.

33. **Publications/Manuals:** Following Publications/Manuals are to be provided free of cost and language should be in English:

- a. 03 x sets of Illustrated Parts Catalogue (IPC) with price up to component level, i.e the parts catalogue of component to be provided in hard and soft copy.
- b. 03 x sets of Operational and Technical Manual of all equipment are to be provided in hard and soft copy.
- c. Maintenance /Technical Manual up to 3rd line maintenance to be provided in 03 x sets in hard and soft copy.
 - (1) Trouble shooting with rectification procedures through flow chart.
 - (2) Any other information which will be required to take reference for smooth operation and maintenance of whole system including all equipment of Digital Trunking System, testers etc.

34. **Brochure/Manual/Bulletins:** All mandatory and other Service Bullentins/ Modifications which are applicable /mentional in the bulletin for upgraded Digital Trunking System (already due/will fall due during the delivery of the item) should be provided in English language.

35. Bidder is to provide a Certificate from OEM regarding regular supply of technical bulletins, alert service bulletins (ASB), ammendments to manuals and other documents throughtout the service life of the Digital Trunking System.

36. **List of Tools and Equipment:** The bidder is to provide a list of suitable tools and equipment (if any) with quantity and type which will be supplied as a part of the offered Digital Trunking System.

37. **Backup Spares:** The bidder is to provide a detailed list of backup spares required for 02 (two) years uninterrupted operation of the Digital Trunking System after warranty period and to be quoted separately. BAF shall have the option to select/accept all, some or none of the proposed backup spares. As such, the price will not be considered for determining the lowest bidder.

38. **Repair and Spare Support Assurance:** Bidder is to provide Guarantee Certificate from OEM for providing spare support to BAF throughout the service life of the Digital Trunking System.

39. **Necessary software, programming/ configuration software with interface cables, software perpetual license etc:** All the configurations are to be provided to BAF in a suitable media.

40. **All required network accessories and any other accessory required for the completion of the project:** As per requirement

41. **Service Life:**

- a. System service life should be 10 (ten) years or more.
- b. The supplier must provide assurance to provide continuous supply of spares throughout the entire service life.

42. **Demonstration:** As per BAF requirement, the bidder should be able to practically demonstrate the overall system at BAF designated site.

43. **Training of BAF Personnel:** Theoretical and practical training shall be conducted for 05 x BAF personnel at the manufacturer's premises. Detailed theoretical and practical training will be as under:

- a. **Operation and Maitenance Training.** The bidder shall offer elaborate theoretical and practical training for 05 x BAF personnel on operation and maitenance of the whole system which will include class room training and hands on equipment training at the manufacturer's premises. Duration of training will be 05 x weeks, 08 hours/day, 05 working days per week (holidays not to be counted). The bidder is to include detail of the training with recommended duration with the offer.

b. **Training Expenditure.** All expenditures including both way air tickets for the trainees up to the manufacturer's premises/ training institute, food, accomodation, basic medical support, internal transportation of the training team are to be ogranised and borne by the bidder. All the air tickets will be economy class. Officers will have single room in at least 3 star or equivalent hotel and other ranks personnel will have double sharing 3 star or equivalent accomodation. Supplier will provide pocket money to each trainee 75 USD/per day.

44. The bidder is to mention elaborate breakdown of the training, including syllabus,contents, schedule and place of training (where necessary). BAF will have the option to accept/reject/modify/discard all or part of the training schedule/syllabus.The bidder shall quote the cost of operation and maintenance training in the financial part of the contact.

45. **Mobile Switching room, Network room, Battery Room, Store Room and Workshop for Digital Trunking System.**

a. **Local Items.** The bidder is to supply necessary local items for equipment room and MSO of Digital Trunking System. Utility services, fittings & furniture, hardstand/ basement with antenna mountings are to be provided by supplier.

b. **Drawing.** Supplier is to provide detailed layout plan of provisioning associated utility services for Digital Trunking System. **The bidder must survey the site before submitting the offer.**

c. **Utilities.** Supplier is to facilitate the rooms with appropriate electricity connections (including power cable from nearest distribution point), water supply, drainage system and lightning and surge protection system.

d. **Furniture.** Supplier is to furnish all the equipment rooms and office room with appropriate furniture. Supplier is to provide list of furniture with brand name (HATIL/ AKHTAR/ NAVANA) and quantity.

e. **Timeline.** Supplier is to complete all associated layout within 3 months of signing of contract. Detailed timeline and all necessary layout/ diagrams of the above-mentioned plans are to attach along with the offer.

PART-3: GENERAL TERMS AND CONDITIONS

46. **Pre-shipment Inspection (PSI).**

a. A pre-shipment inspection of complete Digital Trunking System and its associated items will be carried out by 02 x members of BAF team at the Manufacturer's premisses. Duration of PSI will be 05 days and all expenses of PSI team will be borne by BAF. The Bidder is to intimate BAF 60 days in advance about the PSI schedule.

b. The Bidder must show Original Equipment Manufacturer's (OEM) certificates of the items and its manufacturing date at the time of PSI. The same are to be handed over to BAF during acceptance.

c. The team will have full access to all the relevant shops and documents. The bidder will also ensure that BAF team is allowed to check log books, certificates, compliance of bulletins, genuineness of assembled components and any other associated documents/ items during their stay at the Manufacturer's facility. The bidder is to provide assistance regarding security clearance and visa formalities (if required) for PSI team.

47. **Shipment.** The contracted Digital Trunking System and its associated equipments/ items are to be delivered by air/ sea to BAF within 06 months after signing the contract. Items must be packed and supplied in standard sea/air worthy packing with sealed conditon while delivery. The bidder is to deliver the contracted Digital Trunking System and its associated equipment/ items to Bangladesh at Chattogram port (if delivered by sea) or 201 MU BAF (if delivered by air).



The bidder is to deliver the items from Chattogram sea port/ 201 MU BAF to Dhaka by land at the bidder's own expenses and arrangement.

48. **Site Survey.** The bidder is to make a survey of existing resources of BAF at their own expense before submitting the offer. The bidder shall conduct a detail Site Survey at the BAF specified location designated area (Map attached) for installation of Digital Trunking System. The survey shall include all the site preparation activities (earth filling/hardening, power supply connection from nearest HT source with load calculation, water line set up and radio interference mitigation etc). The bidder shall provide a site survey report to BAF within 30 days after signing the contract. All site preparation activities including transformer set up (if required) is to be accomplished by the bidder. The bidder is also to submit a study report mentioning number of repeater along with related items to cover designated area (map attached) for minimum 10 sites.

49. **Installation:** All necessary installation jobs are to be installed by the supplier at different places in Dhaka area (minimum 08 sites). The supplier is to hand over the equipment to BAF in serviceable and operational condition. Necessary harness, fittings, diagram and any other necessities are to be provided within the quoted cost by the supplier for installation. After the successful completion of site preparation, the supplier shall install the Digital Trunking System at BAF designated site. During installation, any damage, burnt-out or de-shaped part, equipment or spare should be replaced with a new one; no repaired or modified item will be accepted. After completion of installation of the Digital Trunking System, the supplier shall carry out a detail test of all the equipment of the Digital Trunking System in presence of BAF experts. Turn-around time for completion of installation will be maximum 90 days from the date of arrival of all equipment at installation site.

50. **Functional/ Operational Check.** Operational/functional check of Digital Trunking System and its associated equipment will start after the satisfactory preliminary functional test and will be carried out by BAF experts and the bidder's representative. The Functional/ Operational check will be carried out for 30 days (12 hours daily). The Calibration of the Digital Trunking System may be carried out during the functional/ operational check. During the Operational/ Functional check period, if Digital Trunking System remains unserviceable for more than 5 days at a time due to the shipment of any parts, Operational/ Functional check period will stop and fresh Functional/ Operational check will be restarted.

51. **Acceptance Check.** Acceptance will be carried out after the satisfactory Functional/ Operational check. During functional/ operational check, if the system is found unsatisfactory, acceptance will be held up till the same is corrected.

52. **Technical Support Team (TST).** Bidder is to keep a minimum 01 member Technical Support Team (TST) consisting of foreign OEM expert for a duration of 03 months TST and 09 months online support after completion of acceptance check to render technical support of Digital Trunking System, associated equipment and all of its relevant software for smooth operation of the system.

- a. TST is to be sent to Bangladesh after acceptance of the Digital Trunking System and its associated equipment in Bangladesh by BAF. TST would ensure the followings:
 - (1) Routine maintenance and care of the Digital Trunking System and associated equipment.
 - (2) Diagnosis, trouble shooting and repair of Digital Trunking System and associated equipment.
 - (3) Support for operation.
 - (4) The TST is to provide support for raising warranty claim for unserviceable items and expedite for quick arrival of items.
- b. The TST will assist BAF in carrying out the first major schedule inspections as applicable of the Digital Trunking System, communication and any other equipment. Necessary spares, consumable items are to be provided by the bidder within the warranty period.

c. BAF will arrange security clearance for the TST. The list of the team members along with necessary information is to reach Air Headquarters (Directorate of C&E) at least 30 days before their date of arrival.

d. The bidder shall quote the cost for TST service which will be included in the financial part of the contract. All other expenditure (including food, accomodation, transportation and medical care etc) of TST will be borne by the supplier.

53. **On-site Practical Training.** TST will provide "On Site Practical operational and Maintenance Training" at BAF site to the BAF technicians and operators (minimum 12 persons for 05 weeks) for smooth operation and maintenance of the Digital Trunking System at no extra cost.

54. **Warranty:** One (01) year replacement warranty for all network, VHF/ UHF Radio & accessories unit and additional 01 year after sales service. PG will be returned after completion of warranty.

55. Items/ Equipment, if any, found unserviceable/ defective during warranty period, the same is to be replaced/ repaired by the bidder free of cost within 30 days from the date of reporting. Both ways airfreight and insurance charges for the unsatisfactory/ unserviceable item will be borne by the supplier.

56. The period of unserviceability at a time up to 18 (eighteen) hours will be considered as unserviceability period of 1(one) day. During the total warranty period of Digital Trunking System or any ancillaries of the system upto 15 days (including holidays) will be permissible. Any unserviceability beyond 15 days will be added to the warranty period for the purpose of respective period calculations.

57. Both ways Freight and Insurance charges will be borne by the bidder for the warranty replacement items.

58. If the bidder fails to repair/ replace an item/ equipment under warranty claim within the stipulated days as given before then the warranty period would be extended by the number of days of delay in repairing/ replacing the item/ equipment under warranty.

59. Foreign specialist team coming for installation job, where tester/test equipment/special tools are required to be brought to Bangladesh as accompanied or unaccompanied luggage and which will be taken back after installation, is to be declared the same at Hazrat Shahjalal International Airport or the port of entry. Specialist team is also requested to intimate BAF well in advance so that BAF may assist in clearing the same from custom authority during arrival and departure.

60. The bidder is to submit detail proposal with cost for maintenance support, which would be needed after expiry of warranty period. This detailed proposal should be put as the list of optional items in both technical and financial offers. During the service life of the Digital Trunking System, if requires any rectification, modification or up-gradation of the Digital Trunking System, the bidder is to provide necessary technical assistance at BAF expense.

61. **Overhaul/ Performance Check.** The bidder is to produce a certificate of OEM that OEM experts would carry out a performance check of the Digital Trunking System every after five years and will do necessary tuning/ alignment adjustment/ rectifications (if any) at BAF's expenditure which will be negotiated at that time.

62. **Miscellaneous Terms & Conditions.** The following miscellaneous terms and conditions are to be followed for Digital Trunking System :

a. Each item should be brand new, unused and latest product. Bidder should mention the year of production in the offer and it should not be earlier than 2023.

b. The bidder shall mention the name and full address of the local agent (if any) in the offer.

- c. Compliances/ Non-compliances is to be mentioned against each tender clause.
- d. BAF/ DGDP reserves the right to increase/ decrease quantity of items and accept/ reject any/ all tender without assigning any reasons.
- e. The cost of Digital Trunking System and additional equipment/ job including all charges is to be 'Firm and Fixed'.
- f. Freight charge will be paid at actual as per original AWB/BL but not exceeding the contracted freight. As such, the freight is to be mentioned in appropriate column of original AWB/BL, otherwise only FOB value will be paid.
- g. Cost of freight and insurance for any surplus spares/ modules/ accessories, which will be taken back after completion of installation of Digital Trunking System, is to be borne by the bidder.
- h. Delivery schedule mentioned in the tender specifications may be changed by DGDP/ BAF due to delay in concluding the contract.
- j. The bidder shall mention the prices in USD/Euro (except for the local supplied items/ services) unit wise which is to be firm and fixed. No increase in price at any stage after submission of offer will be accepted by BAF.
- k. The bidder is to quote the freight charge by sea or air up to Chattogram/Dhaka, Bangladesh. The local transportation of Digital Trunking system in Bangladesh (From the port of arrival to the Digital Trunking system site) is to be arranged and paid by the bidder.
- l. The bidder is to mention the port/country of shipment.
- m. The trans-shipment is not allowed, but if the bidder needs trans-shipment then they are to mention it in their offer about their requirement. In case of such requirement trans-shipment will only be allowed under single Bill of lading (BL)/Air way Bill (AWB).
- n. Partial shipment is allowed but part payment is not allowed.
- p. Trans-shipment is not allowed, however, it may allow one presentation of single BL or airways bill. Transportation charge will be paid as actual (on production of all original shipping document) but not exceeding contracted amount.
- q. BAF may disqualify the offer of a bidder/ supplier who has previous record of poor performance, such as abandoning the works, not properly completing the contract, excessive delay to supply the contracted items, litigation history or financial failures.
- r. BAF may disqualify any offered equipment/ item which model of equipment/ item has previous record of dissatisfactory performance during operation/ functional check in BAF.
- s. The bidder should be able to arrange demonstration of the offered/ proposed overall system with equipment at the BAF selected site within 30 days after submitting the offer.
- t. Prior permission from BTRC is to be taken by supplier before shipment of radio equipment.
- u. Physical inspection of the equipment will be carried out at 201 MU BAF. Functional check of the equipment will be carried out in presence of supplier's representative at 205 MU BAF/ installation site. All the equipment is to be handed over to BAF by the supplier in serviceable and operational condition. Any item found unserviceable /improper during inspection/ acceptance check is to be replaced with serviceable one by the supplier within 30 days.
- v. No conditional offer will be accepted.

63. **Cost to be Quoted.** The bidder shall quote the price of each items separately as mentioned below:

- a. Cost of essential (Price of Digital Trunking System, communication equipment, air-conditioning system and power equipment) requirements. (Para-06).

- b. Cost of optional requirements (Para-16).
- c. Cost of tools and equipments (Para-36).
- d. Cost of 02 years backup support (Para-37).
- e. Cost of BAF personnel Foreign Training (Para-43).
- f. Cost of locally supplied items (Para-45).
- g. Freight charge for shipment (Para-62).
- h. Cost of Installation (Para-49).
- j. Cost of Technical Support Team (Para-52).
- k. Name and the cost of any other additional features.

64. **Factors for Determining the Lowest Bidder.** The supplier is to offer all the items as a package under a turn-key project. Lowest bidder will be determined on the basis of overall price of all the offered items. Offer of partial line item will not be accepted. The bidder shall quote the price of the items as mentioned below which will be considered for determining the lowest bidder:

- a. Cost of Digital Trunking System associated system and power equipment (price of each item is to be quoted separately).
- b. Cost of Foreign Training (Para-43).
- c. Cost of Installation including locally supplied items (Para-45 & 49).
- d. Cost of Technical Support Team (TST) (Para-52).
- e. Freight charge for shipment. (Para-62).
- f. Cost of Tools and Equipment (Para-36).
- g. Backup Spares (Para-37).

65. **Payment Terms.** 100% Payment will be made through irrevocable Letter of Credit. Letter of Credit amounting to 100% LC value will be opened in favor of bidder. Payment may be made as under:

- b. 60% of the CFR/ CPT value may be released on production of following documents:
 - (2) Clean/original Bill of lading issued by the carrier in 06 copies (with one original). Freight amount must be shown in the Bill of lading. Otherwise only FOB value will be paid 06 sets (01x Original & 05x copies.)
 - (2) Supplier's proforma/customs invoice issued for 100% of CFR/CPT value of the shipped goods - 06 copies (with one original).
 - (3) Packing list - 06 copies (with one original).
 - (4) Origin certificate from chamber of commerce - 06 copies (with one original).
 - (5) Manufacturers' Factory/ Suppliers Inspection Report/ certificate -06 copies (with one original).
 - (6) Supplier Warranty/ Guarantee certificate - 06 copies (with one original).
 - (7) Pre-shipment Inspection certificate signed by the BAF member of PSI Team - 06 copies (with one original).
- b. 20% of the CFR/ CPT value may be released on satisfactory acceptance of all the items in serviceable condition as per the contract at BAF installation site and on production of Certificate Receipt Voucher (CRV) to DGDP.

- c. 10% of the CFR/ CPT value may be released after 30 days on satisfactory operation of the Digital Trunking System system and satisfactory certificate from BAF.
- d. Rest 10% of the CFR/ CPT value may be released after the expiry of the warranty period and warranty completion certificate from user.
- e. 100% cost of TST may be released after satisfactory completion of TST service as per the contract and on production of TST completion certificate from user/BAF.
- f. 100% cost of Foreign Training may be released after satisfactory completion of Foreign Training as per the contract and on production of Foreign Training completion certificate from user/BAF.

66. **Payment of Locally Supplied Items.** Payment for the locally supplied items in local currency will be made as follows:

- a. 40% of the total cost will be paid after completion 40% of the total job.
- b. 40% of the total cost will be provided after completion of rest of the job.
- c. 20% of the total cost will be provided after completion of all installation.

67. **Schedules** The bidders are to provide the following schedules:

- a. Overall project implementation programme.
- b. Schedule for Pre-shipment Inspection.
- c. Delivery schedule.
- d. Installation, setting, calibration and organized training schedule.
- e. After sales services programme.
- f. Major maintenance/inspection schedule.

68. **Vendors List.** Full address of the vendors including FAX number and e-mail address are to be provided for all vendor items, used in Digital Trunking System and its associated equipment.

69. Any other tender terms and condition not covered here will be as per the standing rules of BAF/DGDP.

70. Offer shall remain valid for minimum 180 days from the date of opening the tender. Within the validity of the offer, withdrawal of offer or unwillingness to sign the contract by the bidder is not accepted and in such cases action would be taken against the principal and local agent as per DGDP rules.

71. However, any of the common feature/ specification may be relaxed/ amended to meet BAF requirement.



