



GOVERNMENT OF PAKISTAN
Frequency Allocation Board
Plot No. 112, H-10/4, Islamabad

Tender No. NFMMS-1/2026

**SUPPLY AND COMMISSIONING OF SPECTRUM MONITORING
SYSTEM FOR ESTABLISHMENT OF ISLAMABAD MONITORING
STATION HOUSING FAB HQS BUILDING**

“Frequency Allocation Board, Islamabad” a public sector organization invites electronic bids as “**Single stage, two envelopes bidding procedure**” from original manufacturers / authorized dealers / distributors / manufacturers, registered with Income Tax and Sales Tax Department and who are on active taxpayers list of the Federal Board of Revenue for **supply and commissioning of spectrum monitoring system for establishment of Islamabad Monitoring Station Housing FAB HQs Building**.

2. **Electronic Bidding Documents**, containing detailed terms and conditions, method of procurement, procedure for submission of bids, bid security, bid validity, opening of bid, evaluation criteria, clarification / rejection of bids performance guarantee etc, are available for the interested bidders at **e-Pak Acquisition and Disposal System (EPADS)** at (www.eprocure.gov.pk), PPRA (www.ppra.org.pk) and FAB (www.fab.gov.pk) websites.

3. **Pre-bid meeting** shall take place at FAB HQs with online access for remote participants **at 1100 hours on May 13, 2026 PST**. The Bids shall **only** be submitted through EPADS **on or before 1100 hours on May 25, 2026 PST**. Manual / Hardcopy bids shall not be accepted. **Technical Bids** will be electronically opened on same day at **1130 hours on May 25, 2026** in the presence of bidders at FAB HQs with online access for remote participants.

4. In terms of Rule 48 of Public Procurement Rules, 2004 Grievance Redressal Committee (GRC) is constituted for subject procurement. Notification of said GRC is provided on FAB website (www.fab.gov.pk) and on EPADS at (www.eprocure.gov.pk)

Project Officer (NFMMS)

FAB Headquarters, Plot No. 112, Khayaban-e-Jouhar,
Sector H-10/4, Islamabad
Postal Code 44000, Islamabad, Pakistan
Telephone: +92-51-9257892 Fax: +92-51-9257595
Email: projectnfmms@fab.gov.pk



FAB

(TENDER DOCUMENT)

**Supply and Commissioning of Spectrum
Monitoring System for Establishment of
Islamabad Monitoring Station Housing FAB
HQs Building**

Government of Pakistan
FREQUENCY ALLOCATION BOARD (FAB)
Headquarters, Plot No. 112, Sector H-10/4,
Khayaban-e-Jouhar, Islamabad.
Phone No. 051-9257892, 9257721 Ext (155)

CONTENTS OF BIDDING DOCUMENTS

SECTION-1: INSTRUCTIONS TO THE BIDDERS (ITB)

SECTION-2 BID DATA SHEET

SECTION-3: EVALUATION OF THE PROPOSALS

SECTION-4: TECHNICAL SPECIFICATIONS

SECTION-5: GENERAL CONDITIONS OF CONTRACT

SECTION-6: SPECIAL CONDITIONS OF CONTRACT

ANNEXURES

ANNEX-A LETTER OF INTENT

ANNEX-B STAMP PAPER FORMAT OF BLACK-LISTING CERTIFICATE

ANNEX-C DETAILS OF LOCAL PARTNERS/AUTHORIZED DEALERS/SUPPLIER

ANNEX-D THE BIDDER FIRM'S REFERENCES

ANNEX-E PRICE SCHEDULE/BILL OF QUANTITY (BOQ)

ANNEX-F FORM OF CONTRACT

ANNEX-G FORM OF PERFORMANCE BANK GUARANTEE

ANNEX-H FORM OF ADVANCE BANK GUARANTEE

ANNEX-I INTEGRITY PACT

ANNEX-J GUIDELINE FOR TECHNICAL EVALUATION PROCEDURE - LOT (I) DIGITAL RF RECEIVERS (ANALYZERS)

ANNEX-K GUIDELINE FOR TECHNICAL EVALUATION PROCEDURE - LOT (II) RF SENSORS SYSTEM

Table of Contents

SECTION-1: INSTRUCTIONS TO THE BIDDERS (ITB)	5
1. INVITATION TO BID.....	6
2. ELIGIBLE BIDDERS.....	7
3. SOURCE OF FUNDS	7
4. ELIGIBLE GOODS, EQUIPMENT AND SERVICES	7
5. COST OF BIDDING.....	7
6. CLARIFICATIONS REGARDING TENDER DOCUMENTS.....	8
7. AMENDMENT OF BIDDING DOCUMENT.....	8
8. LANGUAGE OF DOCUMENTS.....	8
9. BID PRICE.....	8
10. BID SECURITY / EARNEST MONEY	9
11. VALIDITY OF BIDS	10
12. SUBMISSION OF BID DOCUMENTS.....	10
13. MODIFICATION AND WITHDRAWAL OF BIDS	10
14. OPENING OF BID	10
15. CLARIFICATIONS / CORRECTIONS OF BID	10
16. PROCESS TO BE CONFIDENTIAL.....	11
17. AWARD OF CONTRACT.....	11
18. PERFORMANCE GUARANTEE	11
19. ADVANCE BANK GUARANTEE.....	12
20. TIME FOR COMPLETION OF THE PROJECT.....	12
21. FORCE MAJEURE	12
22. LIQUIDATED DAMAGES	12
23. TERMS OF PAYMENT	12
24. CORRUPT OR FRAUDULENT PRACTICES.....	13
25. CONFIDENTIALITY	13
26. INTEGRITY PACT	13
27. DISPUTE RESOLUTION	13

SECTION-2: BID DATA SHEET15

SECTION-3: EVALUATION OF THE PROPOSALS19

1. PRELIMINARY EVALUATION (MANDATORY)20

2. TECHNICAL EVALUATION CRITERIA.....21

3. FINANCIAL EVALUATION.....32

SECTION-4: TECHNICAL SPECIFICATIONS34

SECTION-5: GENERAL CONDITIONS OF CONTRACT51

SECTION-6: SPECIAL CONDITIONS OF CONTRACT67

Annexures.....73

SECTION-1: INSTRUCTIONS TO THE BIDDERS (ITB)

INSTRUCTIONS TO BIDDERS (ITB)

1. INVITATION TO BID

- 1.1. **Frequency Allocation Board** (hereinafter referred to as “**the procuring agency**”) desires to purchase Spectrum Monitoring System for Establishment of Islamabad Monitoring Station Housing FAB HQs Building as per details outlined in **Section-3 and 4** of the Bidding Document.
- 1.2. The procuring agency invites electronic bid / proposal from registered firms / companies for provision of following Spectrum Monitoring System for Establishment of Islamabad Monitoring Station Housing FAB HQs Building:

Lot No.	Type of Equipment		Qty
i.	RF Sensors/Monitoring Units (Having Built-in Receiver along with GPS, internal storage and data transmission capability) for Islamabad City.	Digital RF Receivers (Analyzers)	3
ii.		RF Sensors System	4

- 1.3. The bidding will be conducted lot wise as per Section 1 clause 12 of ITB.
- 1.4. The bidders must fulfill mandatory requirements for each lot to qualify for further assessment and evaluation through test & trials as defined in Section 3.
- 1.5. One year hardware and software warranty with effect from date of commissioning of equipment.
- 1.6. The bidder must have local service and repair center either maintained by bidder itself or managed through any third-party agreement, with qualified experienced staff. The bidder shall provide a letter of the principal OEM verifying the capability of such facility to carry out necessary repair & maintenance procedures of technical equipment proposed by the bidder.
- 1.7. After Sales Support of Hardware and Software for at least 10 years will be ensured by the bidder, following completion of warranty period.
- 1.8. Bidders may submit bids / proposals for a single lot, or for more lots **SEPARATELY**, and their bids / proposals shall be evaluated accordingly. Bidders must clearly indicate in the Letter of Intent **ANNEX-A**, the equipment, respective lot number and name against which the bidder intends to submit bid / proposal.
- 1.9. Bidders must submit separate financial bids against each lot and financial evaluation of each lot will be conducted separately.
- 1.10. Bid submitted without undertaking, valid documentary evidence, supporting documents and the manner for the various requirements mentioned in the **Section-3 (Evaluation of the Proposal)** of the Bidding Document are liable to be rejected

at the initial stage. No objection regarding the Bidding Document shall be entertained at a later stage during procurement process.

- 1.11. All terms not otherwise defined or provided herein shall have the same meaning ascribed to them in PPRA Rules 2004.

2. ELIGIBLE BIDDERS

- 2.1. All suppliers / authorized dealers / distributors / manufacturers having legal presence in Pakistan and registered with Federal Board of Revenue (FBR) for income tax and sales tax purposes are invited to submit their electronic bid / proposal.
- 2.2. Bidders must ensure that they have submitted all mandatory documents indicated in **Section-3 (Evaluation of the Proposal)** of the Bidding Document. Failure to submit any mandatory document will result in non-responsive and lead to disqualification.
- 2.3. This Invitation to Bid is open to prospective bidders from all countries except India and Israel.
- 2.4. Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by the Government of Pakistan.

3. SOURCE OF FUNDS

- 3.1. The procuring agency is a self-funded organization and shall make payment from its own resources.

4. ELIGIBLE GOODS, EQUIPMENT AND SERVICES

- 4.1. All goods, equipment and related services to be supplied under the Contract shall have their origin in eligible source countries defined by Government of Pakistan for procurement, and all expenditures made under the Contract shall be limited to such goods and services.
- 4.2. For purposes of this clause, "origin" means the place where the goods are manufactured or produced, or the place from which the related services are supplied to major parts of the world. Goods are produced when, through manufacturing, processing, or substantial and major assembly of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.
- 4.3. The origin of goods, equipment and services can be distinct from the nationality of the Bidder.

5. COST OF BIDDING

- 5.1. The Bidder shall bear all costs associated with the preparation and submission of its bid, and the procuring agency in no case shall be responsible or liable for those costs regardless of the conduct or outcome of the bidding process.

6. CLARIFICATIONS REGARDING TENDER DOCUMENTS

- 6.1. A prospective bidder requiring any clarification of the bidding documents may notify the procuring agency electronically through EPADS. The procuring agency will respond to any request for clarification of the bidding documents, which it receives not later than 5 days prior to the deadline for the submission of bids prescribed in the Bid Data Sheet (**BDS**).
- 6.2. The Bidder may visit and examine the project site(s) subject to prior clearance / permission from the procuring agency and obtain for itself on its own responsibility all information that may be necessary for preparing the bid and entering into a contract. The costs of visiting the site shall be at the Bidder's own expense.
- 6.3. The Bidder's designated representative is invited to attend a **pre-bid meeting** (physically/online), which shall take place at Frequency Allocation Board (FAB) HQs **at 1100 hours on May 13, 2026**. The purpose of the meeting shall be to clarify issues and to answer questions on any matter that may be raised at a later stage. The Bidder is requested, as far as possible, to submit any question in writing not later than 24 hours before the meeting.

7. AMENDMENT OF BIDDING DOCUMENT

- 7.1. At any time prior to the deadline for submission of bids, the procuring agency may, for any reason, whether at its own initiative or in response to a clarification requested by prospective bidder, modify the bidding document by issuing an addendum or corrigendum, as the case may be.
- 7.2. All prospective bidders that have obtained the bidding documents will be notified of the amendment on EPADS / PPRA, FAB websites and print media, and the same will be binding on them.
- 7.3. Any addendum or corrigendum thus issued shall form an eternal part of the bidding document. While taking into account the addendum or corrigendum, the procuring agency, at its discretion, may extend the deadline for the submission of bids in order to allow prospective bidders reasonable time for preparation of bids.

8. LANGUAGE OF DOCUMENTS

- 8.1. Bidding Documents and related correspondence shall be in the English language.
- 8.2. The bid should have a covering letter on printed letterhead of the firm/company. All pages of the bid must be initialed / signed and shall bear official seal of the person(s) authorized to sign/endorse.

9. BID PRICE

- 9.1. In preparing the bid price, the bidder is expected to take into account the requirements and conditions outlined in the bidding document. Items against which no price is entered by the Bidder, shall not be paid by the procuring agency.
- 9.2. Price / bid offer should be quoted in **Pak Rupees (PKR)**.

- 9.3. The bidder shall indicate on the appropriate Price Schedule/Bill of Quantities (BOQ) total bid price of each lot i.e. lot (i & ii) it proposes to supply, especially the unit price of test mobile phone of lot – i as per format attached at **Annex-E**.
- 9.4. The price / bid offer quoted shall be firm, final and clearly written / typed in figures and words without any ambiguity.
- 9.5. The bid price should include all the government taxes, custom duties, levies, fee or any other charges as per applicable tax laws of the country.
- 9.6. Bid price should be inclusive of cost of import, transportation/carriage charges, installation and commissioning charges, fixing charges and any other cost which is essentially required to complete the job.
- 9.7. The bidder shall be deemed to have obtained all relevant information with regards to the requirements of the procuring agency which may affect the bid price.

10. BID SECURITY / EARNEST MONEY

- 10.1. The bidder shall furnish sealed bid security / earnest money as per follows:

Lot No.	Bid Security (PKR)
i	8,000,000/-
ii	2,000,000/-

The bid security shall be submitted in the form of a Bank / Demand Draft / Pay Order in favour of the “Frequency Allocation Board, HQs Islamabad”. Furthermore, the Bidder shall provide an affidavit stating that the Bid Security equivalent of above mentioned amount has been furnished. The Bid Security must be submitted physically to the procuring agency before the opening of the bids on EPADS. A copy of the same must also be uploaded on EPADS.

- 10.2. No financial instrument for bid security shall be acceptable to the procuring agency other than specified in Clause 10.1.
- 10.3. Bids not accompanying Bid Security shall be rejected without any right of appeal or claim otherwise.
- 10.4. Bid Security of unsuccessful (technically non-responsive) bidders will be returned before the award of Contract to Most Advantageous Bidder. However, Bid Security of successful (technically responsive / qualified) bidders will be returned after the signing of the Contract with Most Advantageous Bidder.
- 10.5. Bid security shall be forfeited in case it is determined that the bidder, directly or through an agent, participated or competed in this tender or secured the Contract, by any means of corrupt and fraudulent practices as defined under Rule 2 (f) of PPRA Rules, 2004.
- 10.6. The bid security of the Most Advantageous Bidder shall be returned only when the bidder furnishes the Performance Guarantee of an amount equivalent to ten (10%) percent of the total Contract price.
- 10.7. The bid security / earnest money may be forfeited / confiscated: -

- (a) If a bidder withdraws his bid during the period of bid validity.
- (b) In the case of a successful bidder, if he fails to furnish the required Performance Guarantee.

11. VALIDITY OF BIDS

- 11.1. All bids shall remain valid for (**9 x MONTHS**) from the date of opening of technical bids.

12. SUBMISSION OF BID DOCUMENTS

- 12.1. Separate technical and financial bids for each lot are required to be submitted electronically on EPADS as per PPRA rules for “**Single stage, two envelopes bidding procedure**” described under PPRA Rules 2004.
- 12.2. Separate technical and financial evaluation will be carried out for each lot.
- 12.3. Bids must be received by the procuring agency electronically on EPADS not later than the time and date stated in the **BDS**.
- 12.4. No late bids can be submitted electronically on EPADS. Therefore, all bidders must submit their bids before prescribed time limits.

13. MODIFICATION AND WITHDRAWAL OF BIDS

- 13.1. The Bidder may modify or withdraw its bid after submission electronically on EPADS, prior to the deadline prescribed for bid submission.
- 13.2. Bid modification or withdrawal notices received after the bid submission deadline shall not be considered and the submitted bid shall be considered a valid bid.

14. OPENING OF BID

- 14.1. The procuring agency will open the bids electronically on EPADS in the presence of bidders’ designated representatives and anyone who chooses to attend either physically or online, at the time, date, and location stipulated in the Bid Data Sheet (BDS). The bidders’ representatives who are present shall sign a register evidencing their attendance.
- 14.2. Initially, only the Technical bid shall be opened by the Procuring Agency on EPADS. The Financial Bid of technically responsive bidder will also be opened electronically on EPADS at later stage as per PPRA Rules.
- 14.3. Technical and Financial Proposals shall be evaluated as per procedure laid down in **Section-3 (Evaluation of the Proposal)** of the Bidding Document.
- 14.4. The procuring agency reserves the right to reject any one or all of the bids / proposals as per PPRA Rules 2004.

15. CLARIFICATIONS / CORRECTIONS OF BID

- 15.1. To assist in the examination, evaluation and comparison of the bids, the evaluation committee at its discretion may ask the bidder for clarification of its bid. The

request for clarification and the response shall be through EPADS and no change in the price or substance of the bid shall be sought or permitted.

- 15.2. Arithmetical errors can be rectified on the following basis: -
- (a) If there is a discrepancy between the words and figures, the amount in words shall prevail.
 - (b) If there is a mistake in addition / totaling that can be corrected.
 - (c) If the bidder does not accept the corrected amount of bid, his bid shall be rejected and his bid security shall be forfeited.

16. PROCESS TO BE CONFIDENTIAL

- 16.1. No Bidder shall contact the procuring agency on any matter relating to its bidding process from the time of opening of the technical bid till the time of award of Contract.
- 16.2. Any effort by the bidder to influence the procuring agency in the evaluation, comparison or selection decision, or process of award of Contract may result in the rejection of its bid.

17. AWARD OF CONTRACT

- 17.1. Prior to the expiration of the period of bid validity, the procuring agency will notify the successful Bidder on EPADS as well as in writing by registered letter or by email or facsimile that its bid has been accepted.
- 17.2. The procuring agency shall award the Contract as per attached format at **Annex-E** to the Most Advantageous Bidder who shall within **fifteen (15) working days** from the date of intimation by the procuring agency sign the Contract after fulfilling all the formalities and return it to the procuring agency.

18. PERFORMANCE GUARANTEE

- 18.1. The Most Advantageous Bidder shall be required to furnish a Performance Guarantee as per **Annex-G** equivalent to ten [10%] percent of the total contract amount in the shape of Bank Guarantee issued by a scheduled Pakistani bank prior to the signing of the contract.
- 18.2. The Performance Guarantee shall be retained by the procuring agency till the expiry of the warranty period.
- 18.3. Failure of the Most Advantageous Bidder to furnish Performance Guarantee as per timeline defined in Section – I (Clause 17.2 and 18.1) shall constitute sufficient ground for the annulment of award of the Contract and forfeiture of its bid security. In such event, the procuring agency shall have the right to award the Contract to the next lowest evaluated bidder or call for new bids, as the case may be.
- 18.4. The bidder shall ensure that the Performance Guarantee remains valid till the completion of warranty period.

19. ADVANCE BANK GUARANTEE

- 19.1. The Most Advantageous Bidder must submit Advance Bank Guarantee equivalent to the ten (10%) of the Contract amount on the date of signing of the Contract as per **Annex-H**, in addition to Performance Guarantee, specified in Section – I (Clause 18).
- 19.2. Advance Bank Guarantee shall be retained till the delivery and supply of Goods / equipment at the premises prescribed for delivery by the procuring agency.

20. TIME FOR COMPLETION OF THE PROJECT

- 20.1. The Supplier is required to complete the project within **6 months**. The timeline for completion of each milestone shall be specifically defined in the Contract.
- 20.2. Performance and Advance Bank Guarantees should be valid for at least one year, however if project is delayed renewals of the same shall be done by the bidder.

21. FORCE MAJEURE

- 21.1. “**Force Majeure**” means an event which is beyond the reasonable control of a Party and which makes a Party’s performance of its obligations under the Contract impossible or so impractical as to be considered impossible under the circumstances.
- 21.2. Neither Party shall be responsible for delay caused by Force Majeure Event. The timeline for completion of a project shall be extended in case of Force Majeure.

22. LIQUIDATED DAMAGES

- 22.1. Subject to Clause 21 (*Force Majeure*), if the bidder fails to supply Goods/equipment to the Procuring Agency within timeline to be stipulated for such delivery and supply in the Contract, then Liquidated Damages shall be imposed on the bidder at the rate of **(0.5%) of the total Contract price per week**. Provided that in any case the maximum amount of Liquidated Damages imposed on the bidder shall not exceed **ten (10%) percent of the total Contract price**.

23. TERMS OF PAYMENT

- 23.1. All payments shall be made through cross cheques in **Pak Rupees**.
- 23.2. Payment shall be made after deduction of applicable taxes at source as per applicable tax laws of the country and adjustment of Liquidated Damages (if any).
- 23.3. Payment shall be made as per following plan:

Sr. No.	Milestone	Payment Trigger	Payment Due
(1)	Advance Payment	After submission of Performance Bank Guarantee, Advance Bank	10 %

		Guarantee and Signing of Contract	
(2)	Factory Acceptance Test (FAT)	Upon successful completion of Factory Acceptance Test and submission of commercial invoice.	20 %
(3)	Delivery of Goods/ Equipment	Upon successful delivery at procuring agency's premises and submission of commercial invoice.	50 % Payment & Release of Advance Bank Guarantee
(4)	Site Acceptance Test (SAT)/Local Training	Upon successful completion of Site Acceptance Test (SAT)/ Local Training and submission of commercial invoice	20 %
(5)	Completion of Warranty Period	After completion of warranty period.	Release of Performance Guarantee

24. CORRUPT OR FRAUDULENT PRACTICES

- 24.1. The procuring agency requires that Bidders observe the highest standard of ethics during the procurement process and execution of subsequent Contract, in pursuance of this policy, for the purposes of this provision, the terms defined in Rule 2 (f) of PPRA Rules, 2004 shall apply as it is.
- 24.2. The procuring agency shall reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the Contract in question.

25. CONFIDENTIALITY

- 25.1. The bidder will maintain in confidence and will not disclose, disseminate or use any Confidential Information belonging to FAB, whether or not in written form and shall treat all Confidential Information of FAB with the same degree of care as bidder accords its own Confidential Information. The bidder is duty bound to protect its own Confidential Information and agrees that it shall disclose Confidential Information only to those of its employees who need to know such information.

26. INTEGRITY PACT

- 26.1. Procurements exceeding the prescribed limit shall be subject to an integrity pact between the procuring agency and the suppliers or contractors as per **Annex-I**.

27. DISPUTE RESOLUTION

- 27.1. In the event any dispute arises with respect to the bidding and procurement process, prior to the enforcement of the procurement contract, the bidders shall file

a written complaint to the Grievance Redressal Committee (GRC) which will be dealt according to clause 48 of PPRA rules 2004.

SECTION-2: BID DATA SHEET (BDS)

Bid Data Sheet

The following bid-specific data for the spectrum monitoring system to be procured shall amend and/or supplement the provisions in the Instructions to Bidders (ITB). Whenever there is a conflict, the provisions herein shall prevail over those in the ITB.

INVITATION	
ITB 1.1	<u>Name of the procuring agency:</u> Frequency Allocation Board (FAB), Islamabad, Pakistan.
ITB 1.1	<u>Name of Project:</u> Supply and Commissioning of Spectrum Monitoring System for Establishment of Islamabad Monitoring Station Housing FAB HQs Building.
ITB 1.1	<u>Name of Contract:</u> Supply and Commissioning of Spectrum Monitoring System for Establishment of Islamabad Monitoring Station Housing FAB HQs Building.
ITB 6.1	For <u>Clarification of Bid Purposes</u> only, the Procuring Agency's address is: Attention: Project Officer (NFMMS) FAB Headquarters, Plot No. 112, Khayaban-e-Jouhar, Sector H-10/4, Islamabad Postal Code 44000, Islamabad, Pakistan Telephone: +92-51-9257892 Fax: +92-51-9257595 Email: projectnfmms@fab.gov.pk
ITB 12.1	Single stage, two envelopes bidding procedure
ITB 1.3	Lot wise bidding (2 x lots)
ITB 6.3	<u>Venue, Time and Date of Pre-Bid Meeting:</u> A pre bid meeting will take place at the above mentioned address at 1100 hours local time on May 13, 2026.
ITB 8.1	<u>Language of Bid:</u> "English"
BID PRICE AND CURRENCY	
ITB 9.2	<u>Currency:</u> Pak Rupee.
ITB 9.4	The price shall be fixed.
ITB 9.5	The bid price should include all the government taxes, custom duties, levies, fee or any other charges as per applicable tax laws of the country.
BID PREPARATION AND SUBMISSION	
ITB 10.1	<u>Amount of Bid Security (PKR):</u>

	Lot – i: 8,000,000/- Lot – ii: 2,000,000/-
ITB 11.1	<u>Bid validity period:</u> 09 Months.
ITB 12.1	Bids to be submitted electronically on EPADS (www.eprocure.gov.pk).
ITB 12.2	<u>The Deadline for the Submission of Bids:</u> <u>Date: May 25, 2026 Time: 1100 Hours (local time)</u>
ITB 14.1	<u>Date of Opening of Bids on EPADS</u> Location is same as in ITB 6.1. <u>Date: May 25, 2026 Time: 1130 Hours (local time)</u>
CONTRACT AWARD	
ITB 18.1	<u>Amount of performance guarantee:</u> 10% of the total contract price
ITB 19.1	<u>Amount of advance bank guarantee:</u> 10% of the total contract price
ITB 20.1	<u>Completion Deadline</u> Time for completion is within 6 months after award of contract (date of signing the contract by the procuring agency and the Contractor).
TIMELINE	
	<ol style="list-style-type: none"> 1. Tender float on ePADS: 08 May 2026 2. Pre-Bid Meeting: 13 May 2026 3. Publishing of MoM and updated Tender/Bidding Document: 15 May 2026 4. Opening of technical bids: 25 May 2026 5. Preliminary Evaluation of Bids and intimation to short listed bidders for arrangement of equipment for Test & Trials: 26 May 2026 6. Availability of equipment for test & trial by the bidder at the procuring agency Premises: 01 June 2026 (1100 hrs) 7. Evaluation of Technical Proposals and test & trial of equipment: 02 June 2026 to 08 June 2026 8. Upload tech evaluation report on ePADS: 10 June 2026 9. Submission of grievance (if any) till: 17 June 2026

	<p>10. Grievance redressal: 18 – 27 June 2026</p> <p>11. Opening of Financial Proposals of technically qualified bidders: 30 June 2026</p> <p>12. Uploading of Final Evaluation Report: 01 July 2026</p> <p>13. Submission of grievance (if any) till: 06 July 2026</p> <p>14. Grievance redressal: 07 – 16 July 2026</p> <p>15. Issuance of letter / intimation to most advantageous bidder for award of contract: 17-July-2026</p> <p>16. Award of Contract within 15 days of issuance of letter to most advantageous bidder</p> <p>Note: The TEC shall have the absolute right to relax the above overall timeline of the bidding process by a maximum of ten (10) working days in aggregate across all bidding events, and not in respect of any single bidding event, as it may deem necessary in the interest of the procurement process. Provided further that in case any of the above bidding events falls on a weekend or an official public holiday declared by the Government of Pakistan, the TEC shall reschedule such event to the immediately following working day, unless it decides otherwise, in which case advance notice in writing shall be given to all bidders.</p>
WARRANTY PERIOD AND AFTER SALES SUPPORT	
ITB 1.6	One year hardware and software warranty with effect from date of commissioning of equipment.
ITB 1.8	After Sales Support of Hardware and Software for at least 10 years will be ensured by the bidder, following completion of warranty period.

SECTION-3: EVALUATION OF THE PROPOSAL

EVALUATION OF THE PROPOSAL

1. EVALUATION PROCEDURE

- 1.1. The technical proposal of the participating bidders shall undergo evaluation to determine compliance with mandatory requirements listed below as per procedure in Para 1.8: -

S#	Mandatory Requirements	Compliant/Non-Compliant
(1)	Letter of Intent duly completed and signed by the Bidder or an authorized representative as per Annex-A . Authority letter in favor of the signatory shall also be attached.	Mandatory
(2)	Firm/Company Profile (history, address/contacts and services) and copy of NTN Certificate.	Mandatory
(3)	Undertaking certificate on an official letter head of the firm/company that bid security is enclosed with Financial Proposal.	Mandatory
(4)	The firm/company must have 5 years' experience from the date of registration/incorporation (Attach Form-C issued by Registrar of Firms in case of firm or SECP Incorporation Certificate in case of company).	Mandatory
(5)	Documentary Proof that the firm is on Active Tax Payer list of FBR Pakistan.	Mandatory
(6)	Undertaking on stamp paper of Rs. 100/- that firm/company is not black listed by any Govt/Semi Govt/Autonomous body as per Annex-B .	Mandatory
(7)	Authorized Dealer/Distributor/ Manufacturer Firm's certificate from the manufacturer.	Mandatory
(8)	Bidders are required to provide a copy of duly executed Joint Venture or Consortium Agreement, in case of a Joint Venture or Consortium, which shall clearly bind all parties to the Joint Venture or Consortium Agreement jointly and severally liable to the procuring agency for the fulfillment of the Contract, and shall also designate one party to act as a leader of joint venture or consortium (if applicable).	Mandatory
(9)	Submission of complete sets of Audited Reports for the last two years, statement of financial position (balance sheet), statement of comprehensive income (profit and loss), cash flow statement and statement of owner's equity. The account should be for the Bidder and not the parent or group company.	Mandatory
(10)	Details of Local Partner/Authorized Dealer/Supplier as per Annex-C .	Mandatory
(11)	The bidder must have local service and repair center either maintained by bidder itself or managed through any third-party agreement, with qualified experienced staff. The bidder shall provide a letter of the principal OEM verifying the capability of such facility to carry out necessary repair & maintenance procedures of technical equipment proposed by the bidder.	Mandatory
(12)	Details and documentary proof of provision of similar systems (worth PKR 25 million or more per lot) as per Annex-D .	Mandatory

(13)	<p><u>Lot (i) Digital RF Receivers (Analyzers)</u></p> <p>Para wise compliance table of technical parameters / specifications mentioned at:</p> <p>(a) Sr. Nos. (1) to (3) of Table under Part (A) – Mandatory Requirements of Lot (i) under Para 2.1.1 of SECTION-3; and (b) Para 2.1 (Mandatory Requirements) of SECTION-4 (Part-B). <i>Attach documentary proof (Technical data sheets and brochures).</i></p>	Mandatory
(14)	<p><u>Lot (ii) RF Sensors System</u></p> <p>Para wise compliance table of technical parameters / specifications mentioned at:</p> <p>(a) Sr. Nos. (38) to (39) of Table under Part (A) – Mandatory Requirements of Lot (ii) under Para 2.1.1 of SECTION-3; and (b) Para 4.1 (Mandatory Requirements) of SECTION-4 (Part-B). <i>Attach documentary proof (Technical data sheets and brochures)</i></p>	Mandatory

- 1.2. Non-compliance with any of the mandatory requirements and parameters listed in the table under Clause 1.1 above shall render the bidder technically disqualified / non-responsive.
- 1.3. Bids shall be evaluated as a whole, inclusive of all terms and conditions of the Bidding Document.
- 1.4. It shall be examined whether bids comply with the conditions of the Bidding Document. Bidders shall not make any material deviation from the terms and conditions of the Bidding Document.
- 1.5. Any minor informality, non-conformity or irregularity in the documents that does not constitute a material deviation may be waived by the procuring agency.
- 1.6. Technical proposals of all bidders shall be examined in detail to determine whether the proposed spectrum monitoring systems comply with the technical specifications and requirements as per the procedure defined in Para 1.8 below.
- 1.7. Bidders are required to clearly describe and demonstrate how each technical specification is met by the proposed system. In this regard, each bidder shall submit a para-wise compliance table against the technical specifications. The compliance table shall contain two columns namely: **Compliant** and **Non-Compliant**. All compliant entries shall be supported by remarks clearly highlighting the page number(s) where requisite documentary evidence / proof is provided in the bid. All non-compliant entries shall likewise be supported by suitable remarks. Any ambiguous or blank entry shall be treated as non-compliant.
- 1.8. Following opening of technical bids, the Technical Evaluation Committee shall carry out technical evaluation of participating bidders in the following two stages:-

Stage 1 (Preliminary Evaluation of Mandatory Requirements): The TEC shall carry out a compliance check and preliminary evaluation of technical bids against the mandatory requirements listed in the table under Clause 1.1 above, on the basis of documentary evidence submitted by bidders as part of their technical bids. Any bidder failing to comply with any mandatory requirement shall be declared technically disqualified / non-responsive in accordance with Clause 1.2 above and shall not be called for Stage 2 (Field Demonstration / Test and Trials) or allowed to participate in the bidding process

any further, provided that such declaration shall be formally announced in the Technical Evaluation Report once published in accordance with Rule 35(1) of the PPRA Rules, 2004.

Stage 2 (Field Demonstration / Test & Trials): Subject to passing / qualifying Stage 1, all qualified bidders shall be required to arrange a field demonstration / test and trials of the proposed spectrum monitoring system at the procuring agency's premises within six (6) days of the date of intimation by the procuring agency, at no cost to the procuring agency and at no obligation on its part. The purpose of Stage 2 is to physically verify and assess the claims made by bidders in the documentary evidence, technical datasheets and brochures submitted as part of their technical bids. Bidders shall ensure the availability of the proposed monitoring system (having full capabilities, features and the proposed or latest version of operating software) for detailed technical evaluation and marking as per the criteria listed in Para 2.1.1 and Section 4 (Part B) and the guidelines provided in Annexures J and K.

- 1.8.1. Equipment or software of an older version shall not be accepted for testing. Failure to provide the latest and up-to-date equipment or software shall render the bidder technically disqualified / non-responsive. Equipment shall remain available at the procuring agency's premises for test and trial purposes for a period of seven (7) days from the date of receipt, extendable to thirteen (13) days at the discretion of the procuring agency.
- 1.8.2. Bidders qualified for Stage 2 shall also ensure the availability of a dedicated technical expert for the entire duration of the test and trials. Failure to do so shall render the bidder technically disqualified / non-responsive.

2. TECHNICAL EVALUATION CRITERIA

- 2.1. Bid evaluation shall be conducted lot wise (separately) and marking shall be made against each lot separately. Bidder shall ensure that each lot must be separately priced accompanied by separate financial bids.
- 2.1.1. Technical Evaluation Criteria in accordance with Para 1.8 of Section 3, Section 4 (Part B) and guidelines given at Annexures J and K.

Technical Evaluation Criteria of Lot (i) Digital RF Receivers (Analyzers)

S#	Domain	Description	Criteria	Maximum Marks	Remarks
Part A) Mandatory requirements of Lot (i): - Non-Compliance to any mandatory parameter, the bidder will be technically disqualified.					
(1)	Type of Equipment	Compact size with backpack or suitcase bag housing for operations	Compliant/ Non-Compliant	Mandatory	To be checked / verified through test & trial.
		Portable/transportable and easy to carry for drive test and walk-test monitoring	Compliant/ Non-Compliant		
		Built-in GPS, storage and remote connectivity features	Compliant/ Non-Compliant		

S#	Domain	Description	Criteria	Maximum Marks	Remarks
(2)	Technology support	The equipment shall have support for 5G NR (FDD/TDD), GSM, UMTS, HSDPA, HSUPA, HSPA+, LTE, LTE-Advance (FDD & TDD), NB-IoT/Cat NB1 (i.e. 2nd, 3rd, 4th, 5th Generation wireless technologies)	Compliant/ Non-Compliant	Mandatory	
(3)	Decoding capability of Digital RF Receiver (Analyzer)	Decoding and Displaying of System Information (SI), System Information Block (SIB), Master Information Block (MIB) and other Layer-3 messages of all mentioned cellular technologies during drive tests in real time without using SIM card	Compliant/ Non-Compliant	Mandatory	
(4)	Field Test and Trials/ Practical Demonstration of Proposed Monitoring Equipment	Field demonstration / test and trial of the proposed monitoring equipment as per Clause 1.8 of Section 3, Section 4 (Part B) and guidelines given at Annex-J.	Compliant/ Non-Compliant	Mandatory	To be checked / verified through test & trial.
<u>Part B) Digital RF Receiver (Analyzer) Capabilities</u>					
(5)	Equipment weight	Compact Size including backpack or suitcase bag housing for operation	If $\leq 10\text{kg}$ = 1 Mark If $> 10\text{kg}$ = 0.5 Mark	1	
(6)	Frequency range	Support for RF Spectrum Scan for all cellular technologies (5G,4G,3G,2G) in following spectrum bands: - <ul style="list-style-type: none"> • Frequency range (350 MHz – 8 GHz) • Frequency range (24 GHz – 40 GHz or above) 	Support for following frequency bands will be awarded marks as under: <ul style="list-style-type: none"> • Frequency range (350 MHz – 6 GHz) = 1.5 Marks • Frequency range (6 GHz – 8GHz) = 1 Mark • Frequency range (24 GHz – 40 GHz or above) = 1 Mark 	3.5	To be checked / verified through test & trial.
(7)	Measurement Capabilities	Auto-detection and monitoring of multiple cellular technologies (all released versions) simultaneously (5G, 4G, 3G, 2G)	Monitor 4 x technologies (5G,4G,3G,2G) = 8 Marks (2 Marks for each technology) *Marks will be awarded as per relevant validation steps procedure mentioned in Annex-J	8	
(8)		Coverage measurement of the cellular technologies (Log file recording and plotting on maps)	Yes = 2 Marks No = 0 Mark	2	

S#	Domain	Description	Criteria	Maximum Marks	Remarks
(9)		All Protocol Testing of 3GPP Standards (e.g. Rx Level, C/I,RSCP, Ec/No, RSRP, RSRQ, SS-RSRP, SS-RSRQ, SINR, RSSI, CIR etc.)	Yes = 2 Marks No = 0 Mark	2	
(10)		Measurement and analysis of beamforming in 5G technology	Yes = 2 Marks No = 0 Mark	2	
(11)		Capable to measure and detect synchronization problem in TDD bands of 5G and LTE technologies	1 mark for each technology	2	
(12)		5G and LTE TDD Radio Frame Structure Level scanning information	1 Mark each for following levels information: a) Frame b) Sub Frame c) Slot d) Symbol	4	
(13)	Collection of Real Time Correlatable Data through Simultaneous Operation of RF Receiver and Smart Test Phones	The provided solution should be capable to simultaneously collect real time data from the devices i.e., Digital RF receiver (analyzer) and multiple smart test phones operational in parallel during the drive/walk test	Yes = 3 Marks No= 0 Mark	3	
(14)	System Support	Flexibility and support to add more test phones	Yes = 2 Marks No= 0 Mark	2	
(15)		Capable to perform Quality of Service (QoS) measurements of cellular services in indoor/walk test and outdoor/drive test.	Yes = 2 Marks No= 0 Mark	2	
(16)	Batteries	System battery backup time per pack	Battery backup time \geq 3 Hr = 2 Marks Battery backup time < 3 Hr = 1 Mark	2	
		Spare Battery Pack	Spare Battery backup time \geq 3 Hr = 2 Marks Spare Battery backup time < 3 Hr = 1 Marks No Spare Battery = 0 Mark	2	
<u>(Part C) Test (QoS) Mobile Phones Capabilities</u>					
(17)	Type	Smart test phone based on android operating system 15 or better	Yes = 2 Mark No = 0 Mark	2	To be checked / verified through test & trial.
(18)	Operating Mode	It shall possess the capability to conduct Voice, SMS, Video, and Data testing in both standalone	Testing possible in standalone mode = 1 Mark	2	

S#	Domain	Description	Criteria	Maximum Marks	Remarks
		mode and software-controlled mode	Testing possible in software-controlled mode= 1 Mark		
(19)	Voice (2G/3G/VoLTE/VoNR) Testing	Capable to perform Voice (2G/3G/VoLTE/VoNR) testing	If Voice (2G/3G/VoLTE/VoNR) testing possible = 0.25 Mark each If device support voice KPI parameters as defined in Para: 2.3.4, SECTION-4 (Part-B) of bidding document = 1 Mark	2	
(20)	Video Testing	Capable to perform Video Testing	If video testing possible = 1 Mark If device support video KPI parameters as defined in Para: 2.3.4, SECTION-4 (Part-B) of bidding document = 1 Mark	2	
(21)	Data Testing	Capable to perform data testing	If data testing possible = 1 Mark If device support data KPI parameters as defined in Para: 2.3.4, SECTION-4 (Part-B) of bidding document = 1 Mark	2	
(22)	Locking /Unlocking Feature	Test phones shall be capable to lock/unlock any of following desired parameters for QoS test: - <ul style="list-style-type: none"> • Specific technology (2G,3G,4G,5G) • Cell ID/PCI/NCI/PSC/BCCH • Channel Number (ARFCN,UARFCN,E-UTRA, EARFCN, NR-ARFCN) 	Technology lock/unlock feature = 0.5 Mark Cell ID lock/unlock = 0.5 Mark Channel Number Lock/unlock = 0.5 Mark	1.5	
(23)	Carrier Aggregation	Support for carrier aggregation (Intra-band & Inter-band) testing	Intra-band, contiguous= 0.5 Mark Intra-band, non-contiguous= 0.5 Mark Inter-band= 0.5 Mark	1.5	
(24)	OTT Applications Testing	Facebook, WhatsApp, Instagram, YouTube	0.25 marks for each of the 4 x applications	1	
<u>(Part D) Control Software</u>					
(25)	Third Party Device Support	Software shall have support for multiple devices of different vendors (i.e., smartphones, modems, router, CPE etc)	Yes= 2 Mark No = 0 Mark	2	Provide Documentary evidence
(26)	Measurement Options	Interference identification in cellular networks Support for New and evolving application tests i.e., TWAMP Protocol in 5G networks. Interactivity test measuring key parameters such as	1 mark for each	3	To be checked / verified through test & trial.

S#	Domain	Description	Criteria	Maximum Marks	Remarks
		round-trip latency, packet delay variation, packet error rate and proofing bit rate in one single test with millisecond accuracy			
		Capability and flexibility to lock/unlock any desired technologies on test phones			
(27)	GUI Interface	User friendly GUI interface	1.5 Mark each	4.5	
		Data visualization in table, graph, bar chart, line chart, pie chart etc			
		Option to create custom work-spaces			
(28)	Display options	Software shall be capable to display, record, pause and replay the measurements			
		Indicate the faults in the run time using audio/visual display			
		Displaying alarm and notifications failure events like call drop, blocked call etc			
		Displaying the progress of testing in the run time			
		Displaying and ranking (Top N) of all detected channels along with identifier code (MCC/MNC), signal strength, signal quality, frequency, channel number and channel quality in real time	0.5 mark each (Total = 4 marks)	4	
		Display option for RF spectrum power and waterfall in parallel windows			
		Display different parameter in grid and map and the legends should be configurable.			
		Display the status of the connected/disconnected devices.			
		Decoding and Display all following active cells layer 3 messages for cellular technologies in real time:			
		a) System Information (SI)	1 mark each (Total = 3 marks)	3	
		b) System Information Block (SIB)			
		c) Master Information Block (MIB)			
(29)	Advanced 5G NR measurements (Standalone and Non-Standalone Configurations) including Reduced	Feature for Identification of Network Slicing and reduced capability analysis during scanning/decoding of 5G technology	Yes = 1 mark No = 0 mark	1	To be checked / verified through test & trial.

S#	Domain	Description	Criteria	Maximum Marks	Remarks
	Capability Analysis (RED CAP)				
(30)	Time Domain Measurements and Analysis in 5G and 4G TDD Technologies	Time-gate feature for identification of interference in 5G and 4G TDD technologies	Feature Available in Real Time Scanning of Data = 5 Mark Feature Available in Post Processing of Data = 3 Mark	5	
(31)	GIS/GEO Mapping/Route Navigation	Recording and displaying measurement drive test results on digital Google / Openstreet Maps	Yes = 2 Mark No = 0 Mark	2	
(32)	Import and export data	Data import options in CSV, KML/KMZ, Google maps, indoor floor maps of building etc. Any parameter can be exported in csv, tab, txt, KMZ/KML	Import of data = 1 Mark Export of data = 1 Mark	2	Drive test Data Import/Export to be practically shown during field test & trials as per Annex J
(Part E) Bidder Technical Experience (to be checked from documentary evidence)					
(33)	Bidder / OEM Experience	Bidder / OEM must provide details and documentary proofs of provision of similar spectrum monitoring systems (worth PKR 25 million or more) to (industry, regulators, vendors, CMOs, R&D organization etc) as per <u>Annexure-D</u> . (Attach documentary evidence)	One (01) mark for each client, up to a maximum of 5 marks	05	
(34)	Financial Capacity	Bidder must demonstrate that they have the financial capacity to provide the required services by providing information to prove financial viability. (Attach audited financial statements of last two years)	Increase in Annual Sale 0 % = 0 Mark < 20 % = 0.5 Mark ≥ 20 % = 1 Mark Increase in Fixed Assets 0 % = 0 Mark < 10 % = 0.5 Mark ≥ 10 % = 1 Mark Decrease in Current Liabilities 0 % = 0 Mark < 20 % = 0.5 Mark ≥ 20 % = 1 Mark Decrease in Operating Expenses 0 % = 0 Mark < 10 % = 0.25 Mark ≥ 10 % = 0.5 Mark Increase in Investment 0 % = 0 Mark	04	Provide Documentary evidence

S#	Domain	Description	Criteria	Maximum Marks	Remarks
			< 10 % = 0.25 Mark ≥ 10 % = 0.5 Mark		
(35)	Experience of providing after sale support to client	Local repair facility (as per requirement mentioned in Para: 1.1 (11) of Section-3) in Pakistan for customers/clients and experience of providing after sale support for installing, troubleshooting, repair and maintenance to clients. (Attach documentary evidence)	One (1) mark for each client up to a maximum of 5 marks	05	
(36)	Bidder / OEM Training Experience	Experience of providing basic operation and maintenance level trainings on monitoring systems by the bidder / OEM (Attach documentary evidence of previous trainings)	One (1) mark for each training up to a maximum of 5 marks	05	
(Part F) Availability of Proposed System					
(37)	Availability & Physical Inspection of Proposed Monitoring Equipment	Availability of proposed monitoring equipment (having full capabilities / features and proposed/latest version of operating software and firmware) along with all accessories before test & trial within the prescribed timeline. Same will be inspected and graded as under: - (a) Main unit (b) Minimum 2 x Smart Test phones (c) Laptop with Control software (latest version) (d) Complete Antenna System (e) Batteries and Complete Back Pack System	1 mark each	5	
Total Marks				100	
Minimum Qualifying Marks				85	

Technical Evaluation Criteria of Lot (ii) RF Sensors System

S#	Domain	Description	Criteria	Maximum Marks	Remarks
Part A) Mandatory Requirements of Lot (ii):- Non-Compliant to any mandatory parameter, the bidder will be technically disqualified.					
(38)	Type of Equipment	Compact size	Compliant/ Non-Compliant	Mandatory	To be checked / verified through test & trial.
		Portable and easy to carry	Compliant/ Non-Compliant		
		Built-in GPS, internal storage	Compliant/ Non-Compliant		
		Data transmission capability through wired LAN interfaces	Compliant/ Non-Compliant		

S#	Domain	Description	Criteria	Maximum Marks	Remarks
		Frequency Range: Less or equal to 9 kHz and greater or equal to 8 GHz	Compliant/ Non-Compliant		
(39)	Interference analysis in TDD/ FDD frequency bands of 5G/4G	Power vs time display	Compliant/ Non-Compliant	Mandatory	
		Power vs frequency display	Compliant/ Non-Compliant		
		Persistence Spectrum Display	Compliant/ Non-Compliant		
		Zero span mode	Compliant/ Non-Compliant		
		Signal detection of 5G networks from 700 MHz to 8 GHz	Compliant/ Non-Compliant		
		Time-gate feature for identification of interference in 5G and 4G TDD technologies in real time and homing of interferer	Compliant/ Non-Compliant		
(40)	Field Test and Trials/ Practical Demonstration of Proposed Monitoring Equipment	Field demonstration / test and trials of the proposed monitoring equipment as per Clause 1.8 of Section 3, Section 4 (Part B) and guidelines given at Annex-K.	Compliant/ Non-Compliant	Mandatory	To be checked / verified through test & trial.
Part B) RF Sensors System Capabilities (to be checked through test & trials)					
(41)	Type of Equipment	Lightweight handheld ruggedized and weather proof compact size monitoring sensor	If ≤ 08kg = 1 Mark If > 08kg = 0.5 Mark	1	
(42)	Frequency range	Signal detection shall be evaluated from 9 kHz to 8 GHz. Detection from 9 kHz–20 MHz shall be performed using an omnidirectional (rod) antenna, while from 20 MHz–8 GHz, detection (via offered omni/directional antenna) and homing/direction finding (via directional antenna) shall be assessed, including interference hunting in cellular networks. Failure in any test within a specified range shall result in zero marks for that range.	i. 300KHz – 30 MHz AM broadcast and any other service in this range= 1 Mark ii. 30 MHz – 400 MHz a. FM/AM BC, b. VHF/UHF Comm with bearing = 1 mark each, total 2 marks iii. 700 MHz- 6 GHz Cellular services 2G, 3G, 4G, including interference Hunting= 1 mark each tech. Total 3 Marks iv. 2.4 GHz- 8GHz Detection and homing of Point to Point Links = 1 Marks	7	Sample Test performance is attached at Annex -K
(43)	Field Strength Measurement	Field strength measurement in dB μ V/m, dB μ V, dBm	1 Mark Each	3	For complete range of frequencies
(44)	Occupied Bandwidth	β % method and x-dB method	1 Mark Each	2	

S#	Domain	Description	Criteria	Maximum Marks	Remarks
(45)	Demodulation	USB, LSB, AM, FM, PM, CW, Pulse, I/Q	0.5 Mark for each	4	
(46)	Level Detectors	Average, RMS, Positive Peak, Negative Peak	1 Mark each	4	
(47)	Attenuation	User selectable from 0-30 dB or above (manual and automatic)	If ≥ 30 dB = 3 Marks if < 30 dB = 1 Mark	3	
(48)	Monitoring Antenna	Supporting Omni and Directional antennas to cover 20 MHz to 8 GHz or above frequency range	1.5 marks for each type (Omni and Directional Antennas)	3	
(49)	Batteries	Minimum 4 hour battery backup per pack	If ≥ 4 hrs = 4 Mark If < 4 hrs = 2 Mark	4	Battery backup shall be evaluated by operating the system under real task conditions from full charge until complete discharge during test and trial.
		Spare Battery Pack	Yes = 2 Mark No = 0 Mark	2	
(50)	Self Test	Built-in self-test option for troubleshooting and maintenance	Yes = 2 Marks No = 0 Mark	2	
(51)	Spectrum Analysis Display	Frequency Spectrum, Waterfall, Persistence, Maxhold, Minhold, Average, Clear/Write, Squelch	0.5 Mark for each	4	
(52)	Scan Modes	User selectable Panorama Scan, Frequency Scan and Memory Scan	1 Mark each	3	
(53)	GIS and digital maps	The software shall have GIS support for displaying monitoring results through google or open street maps. Bearings shall be automatically transferred and displayed on the GIS interface without manual intervention. The system shall support triangulation and logging/playback with bearing visualization. Manual or user-triggered bearing capture shall not be considered compliant.	Yes= 2 Marks No= 0	2	
(54)	Report Generation	Report shall be in the form of screenshots image (JPEG/PNG), graph, spectrum trace, maps, audio recording, bar chart, table, CSV, excel, word/pdf.	0.5 marks for each visual effect	5	
Part C) Parameters (to be checked from documentary evidence)					
(55)	Real Time Bandwidth	≥ 40 MHz	If > 40 MHz = 6 Marks If 40 MHz = 3 Marks If < 40 MHz = 0 Mark	6	The bidder shall provide documentary evidence
(56)	Receiver Scan Rate	≥ 40 GHz/s	If ≥ 40 GHz/s = 4 Marks If < 40 GHz/s = 2 Mark	4	
(57)	Tuning Resolution:	≤ 10 Hz	If ≤ 10 Hz = 2 Marks If > 10 Hz = 1 Mark	2	

S#	Domain	Description	Criteria	Maximum Marks	Remarks
(58)	Second Order Intercept (IP2)	9 kHz – 30 MHz \geq +50 dBm 30 MHz – 8 GHz \geq +40 dBm	9 kHz – 30 MHz \geq +50 dBm = 1 Mark 9 kHz – 30 MHz < +50 dBm = 0.5 Mark 30 MHz – 8 GHz \geq +40 dBm = 1 Mark 30 MHz – 8 GHz < +40 dBm = 0.5 Mark	2	from the OEM, such as a brochure or an official certificate
(59)	Third Order Intercept (IP3)	9 kHz – 30 MHz \geq +10 dBm 30 MHz – 8 GHz \geq +5 dBm	9 kHz – 30 MHz \geq +10 dBm = 1 Mark 9 kHz – 30 MHz < +10 dBm = 0.5 Mark 30 MHz – 8 GHz \geq +5 dBm = 1 Mark 30 MHz – 8 GHz < +5 dBm = 0.5 Mark	2	
(60)	Overall Noise Figure	\leq 15 dB for complete range of frequencies	If \leq 15 dB = 2 Mark If > 15 dB = 1 Mark	2	
(61)	LO-Phase Noise	\leq -100 dBc/Hz, at 10 KHz offset and RBW 1KHz for complete range of frequencies	If \leq -100 dBc/Hz = 2 Mark If > -100 dBc/Hz = 1 Mark	2	
(62)	DANL	-160 dBm (1Hz) or better for complete range of frequencies	If \leq -160 dBm = 2 Marks If > -160 dBm = 1 Mark	2	
(63)	Monitoring Antenna	VSWR \leq 2.5	If \leq 2.5 = 2 Marks If > 2.5 = 1 Mark	2	
(Part D) Bidder Technical Experience (to be checked from documentary evidence)					
(64)	Bidder / OEM Experience	Bidder / OEM must provide details and documentary proofs of provision of similar spectrum monitoring systems (worth PKR 25 million or more) to (industry, regulators, vendors, CMOs, R&D organization etc) as per <u>Annexure-D</u> . (Attach documentary evidence)	One (01) mark for each client, up to a maximum of 5 marks	05	Provide Documentary evidence
(65)	Financial Capacity	Bidder must demonstrate that they have the financial capacity to provide the required services by providing information to prove financial viability. (Attach audited financial statements of last two years)	Increase in Annual Sale 0 % = 0 Mark < 20 % = 0.5 Mark \geq 20 % = 1 Mark	04	
			Increase in Fixed Assets 0 % = 0 Mark < 10 % = 0.5 Mark \geq 10 % = 1 Mark		
			Decrease in Current Liabilities 0 % = 0 Mark < 20 % = 0.5 Mark \geq 20 % = 1 Mark		
			Decrease in Operating Expenses 0 % = 0 Mark < 10 % = 0.25 Mark \geq 10 % = 0.5 Mark		
		Increase in Investment 0 % = 0 Mark < 10 % = 0.25 Mark \geq 10 % = 0.5 Mark			
(66)	Experience of providing after sale support to client	Local repair facility (as per requirement mentioned in Para: 1.1 (11) of Section-3) in Pakistan for customers/clients and experience of providing after sale support for installing, troubleshooting, repair and maintenance to clients. (Attach documentary evidence)	(One (1) mark for each client up to a maximum of 4 marks)	04	

S#	Domain	Description	Criteria	Maximum Marks	Remarks
(67)	Bidder / OEM Training Experience	Experience of providing basic operation and maintenance level training on monitoring systems by the bidder / OEM <i>(Attach documentary evidence of previous trainings)</i>	(One (1) mark for each training up to a maximum of 4 marks)	04	
Part E) Availability of Proposed System					
(68)	Availability & Physical Inspection of Proposed Monitoring Equipment	Availability of proposed monitoring equipment (having full capabilities / features and proposed version of operating software) along with all accessories before test & trial within the prescribed timeline. Same will be inspected and graded as under: - (a) Main Unit (b) Battery Pack (c) Omni-directional antenna system (d) Directional antenna System (e) Carrying case for safe transportation	2 marks each	10	
Total Marks				100	
Minimum Qualifying Marks				85	

2.2. Financial Bid of the bidder scoring 85 and above in Technical Evaluation shall be opened and bids of non-qualified bidders shall be returned un-opened.

3. FINANCIAL EVALUATION

3.1. After the technical evaluation is completed, the procuring agency shall notify those bidders whose proposals did not meet the minimum qualifying marks (85) or were considered nonresponsive to the bidding document, indicating that their Financial Bids shall be returned unopened. The procuring agency shall simultaneously notify the bidders securing minimum qualifying marks during the Technical Evaluation, indicating the date and time set for opening the Financial Bids.

3.2. **Bidders must submit separate financial bids against each lot and financial evaluation of each lot will be conducted separately.**

3.3. The bidder shall indicate on the appropriate Price Schedule / Bill of Quantities (BOQ) total bid price of each lot i.e., lot (i & ii) it proposes to supply, especially the unit price of test mobile phone of lot – i as per format attached at **Annex-E**.

3.4. The Financial Bids shall be opened publicly in the presence of the Bidder's representatives who choose to attend.

3.5. The name of the bidder, the technical evaluation scores, the bid security and bid prices shall be read aloud and recorded when the Financial Bids are opened. The procuring agency shall prepare minutes of the public opening.

- 3.6. The relevant committee shall determine whether the Financial Bids are complete, correct and without any computational errors. Arithmetical errors shall be rectified on the following basis: -
- 3.6.1. If there is a discrepancy between the unit price and the total price, which is obtained by multiplying the unit price and quantity, or between subtotals and the total price, the unit or subtotal price shall prevail, and the total price shall be corrected.
- 3.6.2. If there is a discrepancy between words and figures, the price in words shall prevail. If the Bidder does not accept the correction of errors, its bid shall be rejected.
- 3.6.3. The comparison shall be, on the lot-wise total offered price in Price Schedule/BoQ as per attached format at **Annex-E** for delivery at final destination to the procuring agency and inclusive of all foreign and local taxes, duties, freight and Insurances including but not limited to delivery, installation, testing and training.
- 3.7. Formula for financial scoring is that the lowest bidder gets 35 points and the other bidders score $35 \times$ the ratio of the lowest bid divided by the quoted price.
- 3.7.1. **Example:**
- Value quoted by the lowest bidder = A
- Value quoted by the second lowest bidder = B
- Value quoted by the third lowest bidder = C
- Financial scoring of lowest bidder will be = 35
- Financial scoring of second lowest bidder will be = $(A/B) \times (35)$
- Financial scoring of third lowest bidder will be = $(A/C) \times (35)$

4. FINAL EVALUATION

- 4.1. **Technical proposal weightage is 65% and Financial proposal weightage is 35%.**
- 4.2. Technical scoring out of 100 =A
- Carried forward and prorated technical scoring = $A \times 0.65$
- 4.3. Points obtained in the detailed technical evaluation will be carried forward for further final evaluation. Lot-wise contract will be awarded to the most advantageous bidder with maximum accumulative points (Technical score + Financial score).
- 4.4. The bidder with the most advantageous bid, if not in conflict with any other law, rules, regulations or policy of the Federal Government, shall be awarded the procurement contract.

SECTION-4: TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

INDEX

1.	PART- A: GENERAL INFORMATION AND REQUIREMENTS	36
2.	PART- B: DETAILED TECHNICAL SPECIFICATIONS	43

SECTION-4 (PART A): GENERAL REQUIREMENTS AND INFORMATION

1. Introduction

- 1.1. Part A: of this Section describes general information about requirements for the project. Part B contains detailed technical specifications for the main system components required under the contract.

2. Scope of the Work and Project Requirements

- 2.1. The main scope of work includes supply, installation, integration, operation, testing, support, warranty and after sale support for the Monitoring System required under the project.
- 2.2. One year hardware and software warranty with effect from date of commissioning of equipment.
- 2.3. The Bidders may submit bids / proposals against a single or both lots indicated in the following table: -

Lot No.	Type of Equipment		Qty
i.	RF Sensors/Monitoring Units (Having Built-in Receiver along with GPS, internal storage and data transmission capability) for Islamabad City.	Digital RF Receivers (Analyzers)	3
ii.		RF Sensors System	4

- 2.4. The above-mentioned spectrum monitoring system shall be compliant with the ITU-R standards and recommendations. The equipment shall be designed with a modular architecture and shall use the latest technology. It should be easily upgradeable and adapt to new hardware and software features.
- 2.5. After Sales Support of Hardware and Software for at least 10 years will be ensured by the bidder, following completion of warranty period.
- 2.6. Operation and maintenance user manuals.
- 2.7. Staff training by the bidder / OEM on basic troubleshooting, operation and maintenance of the equipment.
- 2.8. The hardware and software warranty for **Twelve (12) Months** period from the date of commissioning of equipment.
- 2.9. Local technical and operational support during the warranty period.

- 2.10. Lot-wise Factory Acceptance Test (FAT) / pre-shipment inspection of the proposed equipment at OEM's premises.
- 2.11. Site Acceptance Test (SAT) of the proposed equipment after arrival at the premises of procuring agency.
- 2.12. The Bidders shall tender according to the system specifications and configuration described in this Section. A different configuration with only those modifications which shall bring improvements to the system's performance shall be considered. The bidders shall describe in detail the improvements and capabilities.
- 2.13. **Bill of Quantities (BOQ).** The BOQ format attached at **Annex-E** indicates the minimum quantities that shall be quoted by the Bidders. Where no quantities have been specified, this attachment is only indicative and the Bidders shall offer the required quantities according to their system design.

3. **Applicable Standards**

- 3.1. Lot (i) system should support the latest recommendations and standards of ITU/ ETSI/3GPP standards related to QoS of 5G, 4G, 3G and 2G technologies.
- 3.2. Lot (ii) system shall be capable to perform measurement of following signal parameters as per the ITU standards mentioned as under: -

Table 1 ITU-R Recommendations for Monitoring Functions

No.	Signal Parameters Measurements	ITU-R Recommendations
a.	Frequency	Recommendation ITU-R SM.377-4, ITU Spectrum Monitoring Handbook, 2011, Section 4.2
b.	Field strength	Recommendation ITU-R SM.378-7
c.	Modulation	Recommendation ITU-R SM.328 -11 ITU Spectrum Monitoring Handbook, 2011, section 4.6 and 4.8
d.	Bandwidth	Recommendation ITU-R SM.443-4 ITU Spectrum Monitoring Handbook, 2011, Section 4.5
e.	Signal Analysis and Identification	Recommendation ITU-R SM.1600-3 ITU Spectrum Monitoring Handbook, 2011, Section 4.8

- 3.3. Supplier shall also ensure that following technical specifications of the Lot (ii) system shall be measured according to latest ITU-R Recommendations mentioned as under: -

Table 2 ITU-R Recommendations for Monitoring Equipment Test Measurement Procedure

No.	Monitoring Equipment Parameters	ITU-R Recommendations
a.	Selectivity of monitoring receivers	Recommendation ITU-R SM.1836 Report ITU-R SM.2125
b.	IP3 of monitoring receivers	Recommendation ITU-R SM.1837 Report ITU-R SM.2125
c.	Noise figure of monitoring receivers	Recommendation ITU-R SM.1838 Report ITU-R SM.2125
d.	Scanning speed of monitoring receivers	Recommendation ITU-R SM.1839 Report ITU-R SM.2125
e.	Sensitivity of monitoring receivers	Recommendation ITU-R SM.1840 Report ITU-R SM.2125
f.	Other parameters	Report ITU-R SM.2125

- 3.4. The Supplier awarded the contract shall be responsible for arranging the testing of technical specifications that cannot be verified/tested during field demonstrations / tests and trials conducted at the procuring agency's premises due to non-availability of the required test equipment. In such cases, where verification / testing is only feasible at the Original Equipment Manufacturer's (OEM) premises owing to the availability of specialized equipment, the selected Supplier shall ensure that all such tests are incorporated into the Site Acceptance Test (SAT) and Factory Acceptance Test (FAT) protocols.

- 3.5. Tests shall be performed by the supplier in presence of FAB team.

4. **Evidence of Compliance.** The documentary evidence to be submitted with the bids shall consist of: -

- 4.1. A certificate of origin of the goods/equipment offered.
- 4.2. A detailed description of the essential technical and performance characteristics of the proposed equipment.
- 4.3. A commentary on the procuring agency 's Technical Specifications and adequate evidence demonstrating the substantial responsiveness of the proposed equipment to those specifications.
- 4.4. The bidder shall submit a para wise compliance table to the technical specifications. The compliance table shall have two columns Compliant & Non-Compliant.

All non-compliant entries shall be supported by suitable remarks. Any ambiguous or blank entry would be considered as non-compliant.

- 4.5. The documentary evidence of the conformity of the proposed equipment to the bidding documents may be in the form of literature, drawings, technical data sheets and brochures.

5. Warranty and Technical/Hardware/Software Support

- 5.1. The warranty of software and hardware shall be valid for **Twelve (12) Months** starting from the date of commissioning certificate from the procuring agency.
- 5.2. Warranty services shall comprise of replacement/repair of defected hardware elements, components, subsystems or system and configuration / troubleshooting/calibration of hardware and software. The period for correction of defects in the warranty period is **Thirty (30) Days** from the date of receipt of equipment including transportation and clearance.
- 5.3. The bidder shall provide all the expertise to the procuring agency in installation and working of the software tool and all its functionalities.
- 5.4. Warranty Certificate shall be provided on the stamp paper duly notarized along with the Warranty Cards duly stamped by the company.
- 5.5. Local technical support shall be made available with required technical expertise.
- 5.6. Supplier shall have local on-call operational support for the procuring agency during the warranty period.

- 6. Insurance.** The successful bidder shall be responsible for provision of equipment/system which is insured/ free of cost until the Final Acceptance Certificate (FAC) of the equipment is issued by the procuring agency.

- 7. General Design Requirements.** The degree of standardization of parts and components of the entire system shall be as high as possible: -

- 7.1. All system components, which are designed, procured, implemented and commissioned should be: -
- a) Equipment of latest version.
 - b) State of art production.
 - c) Upgradable.
 - d) Open interface.
 - e) Support for third party software.
- 7.2. The design and the electrical and mechanical construction, as well as the finishing of all measurement equipment shall confirm in all respects with good engineering practice and such equipment shall be suitable for use under local climatic conditions in Pakistan.

- 7.3. The equipment and software shall be guaranteed under the operating conditions given in table below: -

Ambient Temperature	-10° C to + 55°C
Relative Humidity	95 % non-condensing
Atmospheric Pressure	90 to 110 kPa
Altitude	>3000 meters

- 7.4. All the materials made of plastic, rubber, electrical insulating, etc., shall be of good quality. The different plastic or rubber parts shall not be degraded by the climatic conditions in Pakistan. The use of inflammable or organic material shall be minimized and the materials used for the equipment shall comply with a minimal inflammable class.
- 7.5. The mechanical design of the Testing/ measuring equipment must be fully compatible with the International Recommendations with regards to the electromagnetic compatibility (EMC), electrical discharge (ESD) & SAR. The Bidder shall indicate the international specifications the equipment is compliant with.
- 7.6. The equipment shall be fully maintainable in Pakistan through the supply of spare parts, tools and measuring equipment. All cables, connectors, interfaces, and any other hardware and software required for delivering a fully operational system as per description given herein shall be the responsibility of the Bidder.

8. Power Supply

- 8.1. The power source for all electrical equipment shall be single phase 220 VAC \pm 10%, 50 Hz and DC 12V.
- 8.2. Particular precautions shall be taken to protect the equipment against dangerous high-frequency return paths, excess-voltages and excess currents.
- 8.3. The choice of wire and cabling, the layout of the cabling and equipment shall be such that fire shall not propagate beyond the disconnected devices, fuses and circuit breakers.

9. Inspection and Acceptance Tests

- 9.1. The participating bidders will be evaluated as per criteria and procedure listed in Para 1.8 of Section 3.
- 9.2. After award of contract to the most-advantageous bidder, Inspection and Acceptance Test of each equipment shall be performed by the procuring agency to inspect or test the goods according to pre-agreed criteria. The acceptance shall be conducted at two levels: at the **factory** ("**Factory Acceptance Test**") before shipment of the Goods/equipment and **at site** ("**Site Acceptance Test**") after successful the delivery of Goods/equipment in Pakistan at the procuring agency's premises. The purpose of the tests shall be to establish and verify that whether the Goods/equipment conforms to the specifications as laid down in the bid document.

- 9.3. **Factory Acceptance Test (FAT)** A Team of three personnel per lot from the procuring agency will visit OEM's premises in country of origin of the equipment for lot-wise pre-shipment inspection / FAT for a period of five working days or more as may be necessary to inspect the equipment. The tests shall be performed in accordance with ATP documents submitted by the Supplier. The cost of airfare and boarding / lodging shall be borne by the Supplier.
- 9.4. **Site Acceptance Tests (SAT)** shall be performed by the Supplier along with the representatives of procuring agency after delivery of the Goods/equipment. The tests shall be performed in accordance with ATP documents submitted by the Supplier against each essential requirement, indoor and outdoor in Islamabad and surroundings. The Supplier shall provide all necessary equipment and other items of any nature required to carry out the Acceptance Tests. After the successful completion of the acceptance tests, the procuring agency representatives shall issue an acceptance test certificate.
- 9.5. If the Goods/equipment or any part thereof fails to pass the Commissioning/ Site Acceptance Tests, the procuring agency shall reject the Goods/equipment or any part thereof, which are found to be defective or otherwise not in conformity with the requirements set out in this bidding document. If the Goods/equipment is rejected, the Supplier shall be liable to the procuring agency for any cost of removal, correction or replacement within a period of **thirty (30) working days**.
- 9.6. After the replacement or correction of any faulty/defective equipment or any part thereof, acceptance test procedure shall be repeated as per **Clause 9.4.**
- 9.7. The procuring agency's right to inspect, test and where necessary, reject the Goods/equipment after the arrival in the procuring agency's country shall in no way be limited or waived by reason of the Goods/equipment having previously been inspected and passed by the procuring agency or its representatives prior to the Goods/equipment shipment from the country of origin.
- 10. Training.** Local training shall be conducted as follows: -
- 10.1. Operation and Maintenance level training (including hands-on/field demonstrations) for each equipment shall be organized by the Bidder / OEM at FAB HQs.
- 10.2. Relevant syllabus for the above-mentioned training shall be provided by the Bidder / OEM thirty days before the commencement of the trainings.
- 11. Operation and Maintenance Manuals**
- 11.1. High quality operation and basic trouble shooting manuals in English language for each system shall be provided in hard copies and soft copy.
- 12. Local After Sale Support**
- 12.1 Supplier shall ensure after sales support of hardware and software for at least 10 years, following completion of warranty period.

- 12.2 The supplier must have local service and repair center either maintained by supplier itself or managed through any third-party agreement, with qualified experienced staff. The supplier shall provide a letter of the principal OEM verifying the capability of such facility to carry out necessary repair & maintenance procedures of technical equipment proposed by the supplier.
- 12.3 Supplier shall provide the list of local qualified technical staff with lab experience (in repair and services).
- 12.4 In the technical proposal, supplier shall provide an inventory list of all test equipment available in the local services / repair lab which would be verified upon inspection by the procuring agency.
- 12.5 Supplier shall have local on-call operational support for the procuring agency during the warranty period.

SECTION-4 (PART – B)

DETAILED TECHNICAL SPECIFICATIONS

1. Introduction

- 1.1. The following pages outline the specifications of monitoring system required for the Project.
- 1.2. The Bidders shall attach to their bids a block diagram for below mentioned monitoring equipment indicating the connections and relationships among the various components or sub-systems such as antennas, receivers, DF sub-system, consoles, communications equipment, power supply and GPS receivers. In addition, bidder shall attach detailed technical data sheets and brochures for the verification of technical specifications.

2. Digital RF Receivers (Analyzer) Technical and Functional Specifications

- 2.1. **Mandatory Requirements.** The offered system should include following features:-
- 2.1.1. The equipment design should be Compact size with backpack or suitcase bag housing for operations. It should be Portable/transportable and easy to carry for drive test and walk-test monitoring. It should have Built-in GPS, storage and remote connectivity features
- 2.1.2. The system should support all major cellular technologies, including but not limited to 5G NR (FDD/TDD), GSM, UMTS, HSDPA, HSUPA, HSPA+, LTE, LTE-Advance (FDD & TDD), NB-IoT/Cat NB1. (i.e. 2nd, 3rd, 4th, 5th Generation wireless technologies) across all frequency bands. This capability shall be validated through manual configuration setting of any particular technology and also during blind automatic channel detection through Blind Power Scan.
- 2.1.3. The system should be able to decode and display System Information (SI), System Information Block (SIB), Master Information Block (MIB) and other Layer-3 messages of all mentioned cellular technologies during drive test in real time without using SIM card.
- 2.1.4. The participating bidders will be evaluated as per criteria and procedure listed in Para 1.8 of Section 3. In this regard, Annex-J provides guidelines on how test / trials will be conducted and clarifies the expectations of the procuring agency from the bidder.

2.2. General Requirements

- 2.2.1. The system solution shall include but not limited to the following: -

S#	Description	Qty
----	-------------	-----

1.	Digital RF Receivers (Analyzer)	3
2.	Smart Test Phones	6
3.	Control Software/Data Collection Software	3
4.	Standard Antenna(s)	Matching antenna(s) as per device configuration
5.	Laptop	3
6.	Battery pack including spares	Back up time \geq 3 hours per pack
7.	All necessary accessories	As per requirement of the system

- 2.2.2. The equipment casing should include a backpack system and a suitcase bag for the housing and operation of the equipment. The cabling that needs to be done by the end user should be minimum and easy. The tool should be easy to carry around and can be used in any vehicle.
- 2.2.3. The tool should have option to operate both at DC/AC power 12V and 220V.
- 2.2.4. The equipment design should be compact and lightweight verified by the total weight of the complete backpack system, including the main unit with all batteries and all associated accessories such as RF cables, antennas and test mobile phones.
- 2.2.5. The system shall be highly stable, robust, and reliable under all drive test conditions. It must ensure uninterrupted operation without device disconnections, overall system crashes, or performance degradation due to vibrations, shocks, high temperatures, or any other factor encountered during drive test. In case of disconnection there should be visual/audio warning and reconnection can be done easily without any interruption in the measurement.
- 2.2.6. The system should be capable of performing RF Spectrum Scan and measurements of all cellular technologies (2G, 3G, 4G & 5G) in following spectrum bands:
- - Frequency range (350 MHz – 8 GHz)
 - Frequency range (24 GHz – 40 GHz or above)
- This capability applies to Main Unit, Control Software and also supported Antennas
- 2.2.7. The system should be capable to perform following measurements: -
- a) The system must be capable of automatically detecting, decoding, and monitoring all released versions and implementations of multiple cellular technologies (5G, 4G, 3G, and 2G) simultaneously.

This capability shall be validated during drive test through Automatic Blind Scan along with RF Spectrum Scan in parallel, without any prior RAT or frequency band

- selection. The Inability to detect or decode any active frequency band of any Operator (local or foreign) shall be considered as failure to detect and decode the corresponding technology.
- b) The system shall support coverage measurement of cellular technologies through log file recording and geospatial visualization. It must be capable of generating operator wise coverage analysis, with mapping of individual frequency bands and corresponding radio access technologies.
 - c) All Protocol Testing of 3GPP Standards (e.g. Rx Level, C/I, RSCP, Ec/No, RSRP, RSRQ, SS-RSRP, SS-RSRQ, SINR, RSSI, CIR etc.)
 - d) Measurement and analysis of beamforming in 5G technology i.e. SSB index, SSB wise RSRP, RSRQ, SINR etc.
 - e) The system shall be capable of detecting and measuring synchronization issues in TDD bands of 5G NR and LTE technologies. It should support measurement of Time of Arrival (ToA) with reference to PPS and time offset for all active Physical Cell Identities (PCIs).
- 2.2.8. The system shall support 5G NR and LTE TDD radio frame structure–level scanning, including detailed analysis at frame, subframe, slot, and symbol information within TDD bands
- 2.2.9. The provided solution should be capable to simultaneously collect real time correlatable data from the digital RF receiver (analyzer) and multiple smart test phones operational in parallel during the drive/walk test. Scanner shall be capable of detecting and decoding all Cell IDs identified by the test handsets during the drive test.
- 2.2.10. The system shall provide scalability and flexibility to support the integration of additional test handsets as required in the future. The backpack design must include designated spaces and interfaces to accommodate and securely integrate additional test devices.
- 2.2.11. The system should be capable to perform Quality of Service (QoS) measurements of cellular services in indoor/walk test and outdoor/drive test.
- 2.3. **Smart Test Phones.**
- 2.3.1. The test mobiles should be based on android operating system 15 or better.
 - 2.3.2. It should be capable to conduct Voice, SMS, Video, and Data testing in both standalone mode and software-controlled mode.
 - 2.3.3. It should be capable to perform on-device test of **VOICE, SMS, Video** and **Data** services all cellular technologies (2G/3G/4G/5G) using suitable mobile phone device software without any dependency on laptop and without any degradation.
 - 2.3.4. It should support QoS KPI Parameters as per following: -
 - a) Perceptual Objective Listening Quality Analysis (POLQA) for voice (including VoLTE and VoNR) and video quality Mean Opinion Score (MOS) for both

narrow and wide band as per latest ITU recommendations, 3GPP and ETSI standards.

- b) Data test services such as, throughput UL/DL, ping, FTP DL/UL, HTTP DL/UL, capacity DL/UL (multithread HTTP/FTP), HTTP browsing, messaging (SMS, MMS, email), trace route test (TCP, UDP, ICMP), iPerf3 (TCP, UDP) etc. Any requirement for testing purposes e.g. FTP server etc. to be managed by bidder itself.
- c) QoS KPIs/ parameters approved by the **PTA vide S.R.O 1130(I)/2021 “Cellular Mobile Network Quality of Service (QoS) Regulation, 2021”** : -

S#	Service	QoS KPI Parameter
(1)	Voice (2G/3G/VoLTE)	Network Accessibility
		Call Setup Success Rate
		Call Setup Time
		Call Completion Ration and Call Drop Rate
		End-to-End Speech Quality (POLQA and ITU MOS standard)
(2)	SMS	SMS Success Rate
		End-to-End SMS Delivery Time
(3)	Next Generation Mobile Service/Mobile Broadband Service (2G/3G/4G)	Download User Data Throughput
		Upload User Data Throughput
		Latency
		Webpage Loading Time
(4)	Mobile Network Coverage (2G/3G/4G)	Signal Strength (RSRP, RSCP and RXLEV)

- d) **Other QoS KPI Parameters for 2G/3G/4G/5G: -**

S#	Services	Other QoS KPI Parameters (2G, 3G, 4G & 5G)
(1)	Voice	Call Setup Success Rate (CSSR), Call Drop Rate, RAB Setup Success Rate & Inter System Handover for CS Voice
(2)	Voice & Data	Signal Strength (Rx Level (2G), RSCP (3G), RSRP (4G) & SS-RSRP (5G))
(3)	Voice & Data	Signal Strength Quality (Rx-Qual (2G), Ec/No (3G), RSRQ (4G) & SS-RSRQ (5G))
(4)	Voice & Data	Session Abnormal Release Rate (RAB (3G), E-RAB (4G) & DRB (5G))
(5)	Data Transfer	Download/Upload Success ratio & User Data Throughput
(6)	Video Streaming	Video Streaming Success Ratio, Setup Time & MOS
(7)	Browsing	Webpage Browsing Success Ratio & Access Time
(8)	Data	Ping (Latency, Jitter & Packet Loss)
(9)	Data	E-RAB (4G) and DRB (5G) Setup Success Rate

- 2.3.5. The test phone software should have capability and flexibility to lock / unlock any of the following desired parameters for QoS testing: -
- a) Desired technology i.e. 2G, 3G, 4G, 5G.
 - b) Lock and test specific Cell ID / Physical Cell Identity (PCI)/ NCI / Primary Scrambling Code (PSC)/ Broadcast Control Channel (BCCH)
 - c) Channel Number i.e., Absolute Radio Frequency Channel Number (ARFCN)/ Universal Mobile Telecommunication Service (UMTS) Absolute Radio Frequency Channel Number (UARFCN)/ Evolved Universal Terrestrial Radio Access (E-UTRA) Absolute Radio Frequency Channel Number (EARFCN) and NR-ARFCN 5G New Radio (NR).
- 2.3.6 It shall have support for testing of carrier aggregation (inter-band and intra-band (contiguous/non-contiguous)) in 5G, 4G and 3G technologies.
- 2.3.7. It should have support of application-based testing like, Facebook, Instagram, WhatsApp, YouTube.

3. **Control Software.**

- 3.1.1. The control software should have support for all aforementioned mandatory cellular technologies in Para. 2.1.2 of (Part-B).
- 3.1.2. It should have support for multiple devices of different vendors including but not limited to smartphones, modems, routers and CPE etc.
- 3.1.3. It should be capable of Interference identification in cellular networks during drive test by correlating RF power scan and Signal quality metrics.
- 3.1.4. The graphical user interface (GUI) should be user friendly and easy to use in the field with data visualization in table, graph, bar chart, line chart, pie chart etc formats. It should also have the capability to create custom workspaces.
- 3.1.5. The software should be capable to: -
- a) Display, record, pause and replay the measurements.
 - b) Indicate the faults in the run time using audio/visual display.
 - c) Display alarm and notifications failure events like call drop, blocked call etc.
 - d) Display the progress of testing in the run time.
 - e) Display and rank (Top N) all detected channels along with identifier code (MCC/MNC), signal strength, signal quality, frequency, channel number and channel quality during drive test in real time
 - f) Decoding and display all active cells layer 3 messages including System information(SI), System Information Block(SIB) and Master Information Block(MIB) in real time during drive test.
 - g) Display option for RF spectrum scan and waterfall during simultaneous measurements in parallel windows without any interruption.

- h) Display different parameter in grid and map and the legends should be configurable.
 - i) Display the status of the connected/disconnected devices.
- 3.1.6. Control software should have support for Time Gate feature that is performing real time RF signal isolation (UL/DL/Flexible slots) in the time domain, followed by FFT-based spectral analysis converting the gated time-domain signal into a frequency-domain spectrum, enabling clear and direct identification of interference sources or performing the same Time Gate Feature in post processing (Recording measurements during drive test i.e. I/Q data and then identifying the presence of interference).
- 3.1.7. It should be capable of performing Advanced 5G NR measurements including Reduced Capability Analysis (RED CAP) and of Network Slicing.
- 3.1.8. The software should have GIS/GEO mapping option for recording and displaying measurement results on digital maps.
- 3.1.9. The software should be capable: -
- a) To display and record drive test routes on digital Google / Openstreet maps and the same can be imported/exported.
 - b) To provide facility of navigation like Google Maps to cover the imported route in optimized manner.
- 3.1.10. Provision of data import capability supporting multiple formats including CSV, KML/KMZ, Google Maps data, and indoor building floor maps. The bidder shall demonstrate, in the presence of TEC members, seamless data import and its effective utilization for post-processing analysis, ensuring accuracy and compatibility.
- 3.1.11. The system shall support export of any measured parameter in multiple standard formats, including CSV, TXT, TAB, and KML/KMZ. The bidder shall demonstrate the data export capability in the presence of TEC members, and the exported dataset shall be handed over immediately after the drive test to enable independent post-processing analysis and verification
- 3.1.12. The test will measure support for new and evolving application tests i.e., TWAMP Protocol in 5G networks. The test should measure key parameters such as round-trip latency, packet delay variation, packet error rate and proofing bit rate in one single process with millisecond accuracy. TWAMP server to be arranged by the bidder itself for testing purposes
- 3.1.13. The software should have capability and flexibility to lock/unlock any desired technologies on test phones. Moreover, it should be able to lock and test specific Broadcast Control Channel (BCCH)/ Primary Scrambling Code (PSC)/ Physical Cell Identity (PCI)/ Absolute Radio Frequency Channel Number (ARFCN)/ Universal Mobile Telecommunication Service (UMTS) Absolute Radio Frequency Channel Number (UARFCN)/ Evolved Universal Terrestrial Radio Access (E-

UTRA) Absolute Radio Frequency Channel Number (EARFCN) and NR-ARFCN 5G New Radio (NR).

- 3.2. **System Controller/Laptop.** The system controller should include, a touchscreen laptop computer with high processor speed of minimum i9 or better, 1TB or above hard disk, 32GB or above RAM and genuine licensed Window 11 operating system.
- 3.3. **Standard Antennas.** Suitable matching omni directional antenna of digital RF receiver (analyzer) should be provided for the measurement of RF parameters of cellular technologies. Bidder shall submit technical specifications of the antenna separately.

4. **RF Sensors System Technical and Functional Specifications**

4.1. **Mandatory Requirements**

RF sensor systems should be Compact size, portable and easy to carry. It should have built-in GPS, internal storage for recording of monitoring results and data transmission capability through wired LAN interfaces. Frequency range should be Less or equal to 9 kHz and greater or equal to 8 GHz

- 4.1.1. RF sensor systems should have capability to perform Interference analysis in TDD/ FDD frequency bands of 5G and 4G as per following : -
- Power vs time display
 - Power vs frequency display
 - Persistence Spectrum Display.
 - Zero span mode
 - Time-gate feature for identification of interference in 5G and 4G TDD technologies in real time and homing of interferer.
- 4.1.2. The participating bidders will be evaluated as per criteria and procedure listed in Para 1.8 of Section 3. In this regard, Annex-K provides guidelines on how test / trials will be conducted and clarifies the expectations of the procuring agency from the bidder.
- 4.2. **General Requirements.** The RF Sensors Systems shall meet or exceed following specifications: -

Technical Specifications		
(1)	Type of Equipment	Lightweight handheld ruggedized and weather proof compact size monitoring sensor Weight ≤ 08 kg
(2)	Frequency range	Less or equal to 9 kHz and greater or equal to 8 GHz
(3)	Real Time Bandwidth	≥ 40 MHz
(4)	Receiver Scan speed	≥ 40 GHz/s
(5)	Tuning Resolution	≤ 10 Hz
(6)	Second Order Intercept (IP2)	9 kHz – 30 MHz ≥ +50 dBm, 30 MHz – 8 GHz ≥ +40 dBm

Technical Specifications		
(7)	Third Order Intercept (IP3)	9 kHz – 30 MHz \geq +10 dBm, 30 MHz – 8 GHz \geq +5 dBm
(8)	Overall Noise Figure	\leq 15 dB for complete range of frequencies
(9)	LO-Phase Noise	\leq -100 dBc/Hz, at 10 KHz offset and RBW 1KHz for complete range of frequencies
(10)	Displayed Average Noise Level (DANL)	-160 dBm (1Hz) or better for complete range of frequencies
(11)	Field Strength Measurement	dB μ V/m, dB μ V, dBm for complete range of frequencies
(12)	Occupied Bandwidth	β % method and x-dB method for complete range of frequencies
(13)	Demodulation	USB, LSB, AM, FM, PM, CW, Pulse, I/Q for complete range of frequencies
(14)	Level Detectors	Average, RMS, Positive Peak, Negative Peak for complete range of frequencies
(15)	Attenuation	User selectable from 0-30 dB or above (manual and automatic) for complete range of frequencies
(16)	Antenna type	Type Supporting Omni and Directional antennas to cover 20 MHz to 8 GHz or above frequency range
(17)		Polarization Vertical, Horizontal
(18)		VSWR \leq 2.5
(19)	Battery pack including spares	Minimum 4 hours battery backup per pack
(20)	Self-test	Built-in self-test option for troubleshooting and maintenance
(21)	Spectrum Analysis Display	Panoramic, spectrum, waterfall, Clear/Write, Average, MaxHold, MinHold, Persistence and Squelch etc
(22)	Scan Modes	User selectable Panorama Scan, Frequency Scan and Memory Scan
(23)	GIS and digital maps	The software shall have GIS support for displaying monitoring results through google or open street maps
(24)	Report Generation	Reports shall be in the form of screenshots image (JPEG/PNG), table, graph, map, spectrum trace, audio recording, IQ data recording, CSV, excel, word/pdf etc.
(25)	Relative Humidity	95% non-condensing
(26)	Protection	weather proof
(27)	Accessories	Soft carrying bag
(28)		Hard transit suitcase for proper portability and equipment storage.
(29)		All other necessary accessories

SECTION-5: GENERAL CONDITIONS OF CONTRACT

Table of Contents

1. Definitions.....	53
2. Applications.....	53
3. Country of Origin	54
4. Standards	54
5. Use of Contract Documents and Information; Inspection and Audit by the Bank	54
6. Patent Rights	55
7. Performance Security	55
8. Inspections & Tests	56
9. Packing	57
10. Delivery and Documents.....	57
11. Insurance.....	57
12. Transportation.....	57
13. Incidental Services.....	58
14. Software Patches	58
15. Warranty	58
16. Payment.....	59
17. Prices	60
18. Change Orders	60
19. Assignment	60
20. Delays in the Contractors’s Performance.....	60
21. Liquidated Damages.....	61
22. Termination for Default.....	61
23. Force Majeure.....	63
24. Termination for Insolvency	64
25. Termination for Convenience	64
26. Settlement of Disputes	64
27. Governing Language	65
28. Applicable Law	66
29. Notices	66
30. Taxes and Duties	66
31. Secrecy.....	66
32. After Sales Support.....	66
33. Training.....	66

General Conditions of Contract

1. **Definitions**
- 1.1 In this Contract, the following terms shall be interpreted as indicated;
- (a) "The Contract" means the agreement entered into between the Procuring Agency and the Contractor, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
 - (b) "The Goods" means all of the spectrum monitoring system, equipment and/or other materials, which the Contractor is required to supply to the Procuring Agency under the Contract.
 - (c) "The Services" means those services ancillary to the supply of the Goods, such as transportation and insurance, and any other incidental services, such as installation, commissioning, customization, provision of technical assistance, training, and other such obligations of the Contractor covered under the Contract.
 - (d) "GCC" means the General Conditions of Contract contained in this section.
 - (e) "SCC" means the Special Conditions of Contract.
 - (f) "The Procuring Agency" means the organization purchasing the Goods, as **named in SCC.**
 - (g) "The Procuring Agency's country" is the country **named in SCC.**
 - (h) "The Contractor" means the individual or firm supplying the Goods and Services under this Contract.
 - (i) "The Project Site," where applicable, means the place or places **named in SCC.**
 - (j) "Day" means calendar day.
2. **Applications**
- 2.1 These General Conditions shall apply to the extent that they are not superseded by provisions of other parts of the Contract.

- 3. Country of Origin**
- 3.1 All Goods and Services supplied under the Contract shall have their origin in the countries and territories eligible under the rules of the Government of Pakistan, as further elaborated in the SCC.
- 3.2 For purposes of this Clause, "origin" means the place where the Goods were developed / produced, or from which the Services are supplied. Goods are developed / produced when, through manufacturing, processing, or substantial and major assembly /integration of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components
- 3.3 The origin of Goods and Services is distinct from the nationality of the Contractor.
- 4 Standards**
- 4.1 The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications, and, when no applicable standard is mentioned, to the authoritative standards appropriate to the Goods' country of origin. Such standards shall be the latest issued by the concerned institution.
- 5 Use of Contract Documents and Information; Inspection and Audit by the Bank**
- 5.1 The Contractor shall not, without the Procuring Agency's prior written consent, disclose the Contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the Procuring Agency in connection therewith, to any person other than a person employed by the Contractor in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only as far as may be necessary for purposes of such performance.
- 5.2 The Contractor shall not, without the Procuring Agency's prior written consent, make use of any document or information enumerated in GCC Clause 5.1 except for purposes of performing the Contract.

- 5.3 Any document, other than the Contract itself, enumerated in GCC Clause 5.1 shall remain the property of the Procuring Agency and shall be returned (all copies) to the Procuring Agency on completion of the Contractor's performance under the Contract if so, required by the Procuring Agency.
- 5.4 The Contractor shall permit the Procuring Agency to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the Bank, if so required by the Government.
- 6 Patent Rights**
- 6.1 The Contractor shall indemnify the Procuring Agency against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof in the Procuring Agency's country.
- 7 Performance guarantee**
- 7.1 On the date of signing of contract, the successful Bidder shall furnish to the Procuring Agency the performance guarantee in the price **specified in SCC.**
- 7.2 The proceeds of the performance guarantee shall be payable to the Procuring Agency as compensation for any loss resulting from the Contractor's failure to complete its obligations under the Contract.
- 7.3 The performance guarantee shall be denominated in Pakistani Rupees and shall be in one of the following forms:
- (a) a bank guarantee or an irrevocable letter of credit issued by a reputable AAA rated scheduled Bank located in Pakistan, in the form provided in the bidding documents or another form acceptable to the Procuring Agency; or
 - (b) a cashier's or certified check.

- 7.4 The performance guarantee will be discharged by the Procuring Agency and returned to the Contractor not later than sixty (60) days following the date of completion of the Contractor's performance obligations under the Contract, including any warranty obligations, unless otherwise **specified in SCC.**
- 8. Inspections & Tests**
- 8.1 Inspection and Acceptance Test of each equipment shall be performed by the procuring agency to inspect or test the goods according to pre-agreed criteria. The acceptance shall be conducted at two levels: at the **factory ("Factory Acceptance Test")** before shipment of the Goods/equipment and **at site ("Site Acceptance Test")** after successful the delivery of Goods/equipment in Pakistan at the procuring agency's premises. The purpose of the tests shall be to establish and verify that whether the Goods/equipment conforms to the specifications as laid down in the bid document.
- 8.2 **Factory Acceptance Test (FAT)** A Team of three personnel per lot from the procuring agency will visit OEM's premises in country of origin of the equipment for lot-wise pre-shipment inspection / FAT for a period of five working days or more as may be necessary to inspect the equipment. The tests shall be performed in accordance with ATP documents submitted by the Supplier. The cost of airfare and boarding / lodging shall be borne by the Supplier.
- 8.3 **Site Acceptance Tests (SAT)** shall be performed by the Supplier along with the representatives of procuring agency after delivery of the Goods/equipment. The tests shall be performed in accordance with ATP documents submitted by the Supplier against each essential requirement, indoor and outdoor in Islamabad and surroundings. The Supplier shall provide all necessary equipment and other items of any nature required to carry out the Acceptance Tests. After the successful completion of the acceptance tests, the

procuring agency representatives shall issue an acceptance test certificate.

- 8.4 After the replacement or correction of any faulty/defective equipment or any part thereof, acceptance test procedure shall be repeated as per **GCC 8.3**
- 8.5 The Procuring Agency's right to inspect, test and, where necessary, reject the Goods after the Goods' arrival in the Procuring Agency's country shall in no way be limited or waived by reason of the Goods having previously been inspected, tested, and passed by the Procuring Agency or its representative prior to the Goods' shipment from the country of origin.
- 8.6 Nothing in GCC Clause 8 shall in any way release the Contractor from any warranty or other obligations under this Contract.
- 9. Packing** 9.1 Should be good enough to avoid any loss or damage to the Goods.
- 10. Delivery and Documents** 10.1 Delivery of the Goods and the details of shipping and/or other documents to be furnished by the Contractor in accordance with the terms specified in SCC.
- 11. Insurance** 11.1 All insurances up to testing and acceptance of the delivered goods at the procuring agency's premises shall be the responsibility of the Contractor.
- 12. Transportation** 12.1 The Contractor is required under the Contract to transport the Goods to the Procuring Agency's destinations where ever the installations are required, including insurance and storage, as shall be specified in the Contract, shall be arranged by Contractor, and related costs shall be included in the Contract Price. All foreign and local transportation costs (if any) shall be included in the Bid and borne by the Bidder.

- 13. Incidental Services** 13.1 The Contractor shall be required to provide the following services, including additional services, if any, specified in SCC:
- (a) performance or supervision of on-site installation / commissioning and / or start-up of the supplied Goods;
 - (b) furnishing of tools required for assembly, installation, customization and / or maintenance of the supplied Goods;
 - (c) furnishing of a detailed operations and maintenance manual for each appropriate unit / module of the supplied Goods;
 - (d) performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Contractor of any warranty obligations under this Contract; and
 - (e) training of the Procuring Agency's personnel on-site, during installation, commissioning, assembly, start-up, operation, maintenance, and / or repair of the supplied Goods.
- 14. Software Patches** 14.1 **As specified in SCC**, the Contractor is required to provide / install patches pertaining to software tools developed from time to time by the Contractor, to cater for any bug or add some feature / improvement to the software tools.
- 15. Warranty** 15.1 The Contractor warrants that the Goods supplied under the Contract are new, unused, of the most recent or current versions, and that they incorporate all recent improvements in design and operation unless provided otherwise in the Contract. The Contractor further warrants that all Goods supplied under this Contract shall have no defect, arising from design, materials, or workmanship or from any act or omission of the Contractor, that may develop under normal use of the supplied Goods in the conditions prevailing in the country

of final destination. The Contractor will be responsible for the remedy of any kind of malfunctioning/ crash of the software tools during the entire period of warranty free of cost.

- 15.2 This warranty shall remain valid for twelve (12) months from the date of commissioning of equipment / issuance of Acceptance Certificate from the Procuring Agency.
- 15.3 The Procuring Agency shall promptly notify the Contractor in writing of any claims arising under this warranty.
- 15.4 Upon receipt of such notice, the Contractor shall, within 30 days, repair or replace the defective Goods or parts thereof, without costs to the Procuring Agency.
- 15.5 If the Contractor, having been notified, fails to remedy the defect(s) within 30 days, the Procuring Agency may proceed to take such remedial action as may be necessary, at the Contractor's risk and expense and without prejudice to any other rights which the Procuring Agency may have against the Contractor under the Contract.

16. Payment

- 16.1 The method and conditions of payment to be made to the Contractor under this Contract shall be **specified in SCC.**
- 16.2 The Contractor's request(s) for payment shall be made to the Procuring Agency in writing, accompanied by an invoice describing, as appropriate, the Goods delivered and Services performed, and by documents submitted pursuant to GCC Clause 10, and upon fulfilment of other obligations stipulated in the Contract.
- 16.3 Payments shall be made promptly by the Procuring Agency, but in no case later than sixty (60) days after submission of an invoice or claim by the Contractor.
- 16.4 The currency in which payment is made to the Contractor under this Contract shall be **in Pakistan Rupees only.**

- 17. Prices** 17.1 Prices charged by the Contractor for Goods delivered and Services performed under the Contract shall not vary from the prices quoted by the Contractor in its bid.
- 18. Change Orders** 18.1 The Procuring Agency may at any time, by a written order given to the Contractor, make changes within the general scope of the Contract in any one or more of the following:
- (a) designs, or specifications, where Goods to be furnished under the Contract are to be specifically developed for the Procuring Agency;
 - (b) the method of shipment or packing;
 - (c) the place of delivery; and/or
 - (d) the Services to be provided by the Contractor.
- 18.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Contractor's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Contractor for adjustment under this clause must be asserted within thirty (30) days from the date of the Contractor's receipt of the Procuring Agency's change order.
- 19. Assignment** 19.1 The Contractor shall not assign / sub contract, in whole or in part, its obligations to perform under this Contract.
- 20. Delays in the Contractor's Performance** 20.1 Delivery of the Goods and performance of Services shall be made by the Contractor in accordance with the time schedule prescribed by the Procuring Agency as specified in SCC.
- 20.2 If at any time during performance of the Contract, the Contractor should encounter conditions impeding timely delivery of the Goods and

performance of Services, the Contractor shall promptly notify the Procuring Agency in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the Contractor's notice, the Procuring Agency shall evaluate the situation and may at its discretion extend the Contractor's time for performance, with or without liquidated damages, in which case the extension shall be ratified by the parties by amendment of Contract.

20.3 Except as provided under GCC Clause 23, a delay by the Contractor in the performance of its delivery obligations shall render the Contractor liable to the imposition of liquidated damages pursuant to GCC Clause 21, unless an extension of time is agreed upon pursuant to GCC Clause 20.2 without the application of liquidated damages.

21. Liquidated Damages

21.1 Subject to GCC Clause 23, if the Bidder fails to deliver any or all of the Goods or to perform the Services within the period(s) specified in the Contract, the Procuring Agency shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in SCC. Once the maximum is reached, the Procuring Agency may consider termination of the Contract pursuant to GCC Clause 22.

22. Termination for Default

22.1 The Procuring Agency, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Contractor, may terminate this Contract in whole or in part:

(a) If the Contractor fails to deliver any or all of the Goods within the period(s) specified in the Contract, or within any extension thereof granted by the Procuring Agency pursuant to GCC Clause 20; or

(b) If the Contractor fails to perform any other obligation(s) under the Contract.

(c) If the Contractor, in the judgment of the Procuring Agency, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For the purpose of this clause: “corrupt and fraudulent practices” in respect of the procurement process, shall be either one or any combination of the practices including, -

(i) “coercive practices” which means any impairing or harming or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence the actions of a party to achieve a wrongful gain or to cause a wrongful loss to another party;

(ii) “collusive practices” which means any arrangement between two or more parties to the procurement process designed to stifle open competition for any wrongful gain, and to establish prices at artificial, non-competitive levels;

(iii) “corrupt practices” which means the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence the acts of another party for wrongful gain;

(iv) “fraudulent practices” which means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation; and

(v) “obstructive practices” which means harming or threatening to harm, directly or indirectly, persons to influence their participation in a procurement process, or affect the execution of a contract;

22.2 In the event the Procuring Agency terminates the Contract in whole or in part, pursuant to

GCC Clause 22.1, the Procuring Agency may procure, upon such terms and in such manner as it deems appropriate, Goods or Services similar to those undelivered, and the Contractor shall be liable to the Procuring Agency for any excess costs for such similar Goods or Services. However, the Contractor shall continue performance of the Contract to the extent not terminated.

23. Force Majeure

- 23.1 Notwithstanding the provisions of GCC Clauses 20, 21, and 22, the Contractor shall not be liable for forfeiture of its performance guarantee, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.
- 23.2 For purposes of this clause, " For the purposes of this clause, "Force Majeure" means war or hostility, acts of public enemy, civic commotion, sabotage, Act of state or direction from Statutory Authority, pandemic, epidemic, quarantine restriction, strikes and lockouts, fire, floods, natural calamities or any Act of God or any such event which is beyond the reasonable control of parties and makes their obligatory performance impossible or so impractical under the circumstance or any other material event that could reasonably be considered to be a force majeure event by reason that it is beyond the control of the party affected but does not include financial hardship, inability to pay or fluctuation in exchange rates.
- 23.3 If a Force Majeure situation arises, the Contractor shall promptly notify the Procuring Agency in writing of such condition and the cause thereof. Unless otherwise directed by the Procuring Agency in writing, the Contractor shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

- 24. Termination for Insolvency** 24.1 The Procuring Agency may at any time terminate the Contract by giving written notice to the Contractor if the Contractor becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Contractor, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Procuring Agency.
- 25. Termination for Convenience** 25.1 The Procuring Agency, by written notice sent to the Contractor, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Procuring Agency's convenience, the extent to which performance of the Contractor under the Contract is terminated, and the date upon which such termination becomes effective.
- 25.2 The Goods those are complete and ready for shipment within seven (07) days after the Contractor's receipt of notice of termination shall be accepted by the Procuring Agency at the Contract terms and prices. For the remaining Goods, the Procuring Agency may elect:
- (a) to have any portion completed and delivered at the Contract terms and prices; and/or
 - (b) to cancel the remainder and pay to the Contractor an agreed price for partially completed Goods and Services and for materials and parts previously procured by the Contractor.
- 26. Settlement of Disputes** 26.1 If any dispute or difference of any kind whatsoever shall arise between the Procuring Agency and the Bidder / Contractor in connection with or arising out of the Contract, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation within ten (10) days. Accordingly, if the parties have failed to resolve their dispute or difference by such mutual consultation, then the matter / dispute shall be

referred to the GRC for resolution within ten (10) days. In case, the parties are not satisfied with the decision of the GRC, the case will finally be referred to Executive Director FAB who shall finally decide the matter within ten (10) days.

- 26.2 If the parties are not satisfied with the decision of the Executive Director FAB, then either the Procuring Agency or the Bidder / Contractor may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given.

26.2.1 Any dispute that has not been resolved by applying the mutual consultation or that is not pending before the Executive Director FAB may become the subject of arbitration or litigation by either party under the applicable laws of the Islamic Republic of Pakistan. The location of arbitration shall be in Islamabad. The courts of competent jurisdiction in Islamabad shall have the exclusive authority to try and adjudicate upon the matters or disputes arising out of or in connection with this Contract. The Parties shall be responsible for their dispute resolution costs unless the competent forum decides otherwise.

26.2.2 Arbitration proceedings shall be conducted as specified in the SCC.

- 26.3 Notwithstanding any reference to arbitration herein,
- (a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and
 - (b) the Procuring Agency shall pay the Contractor any monies due to the Contractor not effected under arbitration.

27. Governing Language

- 27.1 The Contract, including all the correspondence and other documents pertaining to the Contract shall be written in English language.

- 28. Applicable Law** 28.1 The Contract shall be interpreted in accordance with the laws of Pakistan.
- 29. Notices** 29.1 Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or through fax or by email, and confirmed in writing to the other party's address **specified in SCC.**
- 29.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.
- 30. Taxes and Duties** 30.1 Contractor shall be entirely responsible for all taxes, duties, license fees, and other such levies imposed inside and outside the Procuring Agency's country.
- 31. Secrecy** 31.1 The Contractor shall undertake that any information about the sales /purchase of the software tools under this contract shall not be communicated to any person other than the Contractor, his representatives and developer of the software tools, or to any press or agency not authorized by the Procuring Agency to receive it. Any breach of this undertaking shall be punished under *the Law of Pakistan*.
- 32. After Sales Support** 32.1 The Contractor certifies to provide After Sales Support of Hardware and Software for at least 10 years following completion of warranty period.
- 33. Training** 33.1 Operation and Maintenance level training (including hands-on/field demonstrations) for each equipment shall be organized by the Contractor at FAB HQs.
- 33.2 Relevant syllabus for the above-mentioned training shall be provided by the Contractor thirty days before the commencement of the trainings

SECTION-6: SPECIAL CONDITIONS OF CONTRACT

Contents

1.	Definitions (GCC Clause 1).....	69
2.	Country of Origin (GCC Clause 3).....	69
3.	Performance Security (GCC Clause 7).....	69
4.	Inspections and Tests (GCC Clause 8).....	69
5.	Packing (GCC Clause 9).....	70
6.	Delivery and Documents (GCC Clause 10).....	70
7.	Insurance (GCC Clause 11).....	70
8.	Incidental Services (GCC Clause 13).....	70
9.	Software Patches (GCC Clause 14).....	70
10.	Warranty (GCC Clause 15).....	71
11.	Payment (GCC Clause 16).....	71
12.	Delays in the Contractor's Performance (GCC Clause 20).....	71
13.	Liquidated Damages (GCC Clause 21).....	72
14.	Settlement of Disputes (GCC Clause 26).....	72
15.	Applicable Law (GCC Clause 28).....	72
16.	Notices (GCC Clause 29).....	72

Special Conditions of Contract (SCC)

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract. The corresponding clause number of the GCC is indicated in parentheses.

1. Definitions (GCC Clause 1)

GCC 1.1 (f) — The Procuring Agency is: Frequency Allocation Board (FAB)

GCC 1.1 (g) — The Procuring Agency's country is: Islamic Republic of Pakistan

GCC 1.1 (h) — The Contractor is: The Company supplying the Goods and Services

GCC 1.1 (i) — The Project Site is: FAB Headquarters, Plot no. 112, Khayaban-e Jouhar, Sector H-10/4, Islamabad.

2. Country of Origin (GCC Clause 3)

All countries except India and Israel.

3. Performance Guarantee (GCC Clause 7)

GCC 7.1—The price of performance guarantee, as a percentage of the Contract Price, shall be: ten percent (10 %).

4. Inspections and Tests (GCC Clause 8)

GCC 8.2— Acceptance Tests will be performed by the Contractor in the presence of procuring agency, according to the Acceptance Testing Plan devised by the Procuring Agency, against each essential requirement, indoor and outdoor (if required) at the locations planned by the Procuring Agency. The Contractor shall provide all necessary equipment and other items of any nature required to carry out the Acceptance Tests. At the conclusion of the acceptance tests, the Procuring Agency representatives will issue an acceptance tests report, with remarks. The Contractor shall fix the first ones within one (1) week of the delivery of the report, while he will have three (3) weeks to clear the remarks. Within seven (7) days of the successful completion of the Acceptance Tests, the Procuring Agency shall issue a Provisional Acceptance Certificate, which will state the Acceptance Date.

GCC 8.3- The Procuring Agency shall appoint an Inspecting Committee to inspect and test the Goods to be delivered by the Contractor under the Contract. The inspection shall be carried out at the locations planned by the Procuring Agency, before the Goods are finally accepted. The Inspecting Committee shall have the authority to reject any supplies, which are found to be malfunctioning or otherwise not in conformity with the requirements of this Contract. If any module of the Goods is rejected Contractor shall be liable to the Procuring Agency for any cost

of removal, correction or replacement. The Inspecting Committee will issue “Inspection Certificate” to all the Goods after which those will be processed for acceptance.

5. Packing (GCC Clause 9)

Not applicable: no additional requirements.

6. Delivery and Documents (GCC Clause 10)

For Goods supplied from abroad:

The Contractor shall keep the Procuring Agency informed regarding all details and dates related to shipment arrival in Pakistan and delivery dates, ensuring that these matches with the Procuring Agency’s desired dates.

The Goods must be delivered at the premises of Frequency Allocation Board, Islamabad.

Documents: The following documents must be delivered at the premises of Frequency Allocation Board Headquarters, Plot No. 112 Sector H-10/4 Islamabad.

- a) Copies of the Contractor’s invoice showing Goods description, quantity, unit price, and total amount.
- b) Receipt issued by the Procuring Agency, certifying that the Goods have been received at the delivery point as specified above.
- c) Inspection certificate, issued by the nominated inspection agency, and the Contractor’s factory inspection report.
- d) Certificate of origin.

7. Insurance (GCC Clause 11)

GCC 11.1—The bidder (Contractor) shall be responsible for the insurance of Goods up to the successful inspection of Goods by the procuring agency at procuring agency’s premises.

8. Incidental Services (GCC Clause 13)

GCC 13.1— After sales service / support for all updates / developments, components, etc (complete functioning) for a period of 10 years.

9. Software Patches (GCC Clause 14)

GCC 14.1—Contractor shall carry sufficient inventories to assure ex-stock supply of consumable spares for the Goods to ensure unhindered operation/ functioning, under the Contractor’s liability for the entire duration of the warranty. Any updates and patches shall be supplied as promptly as possible, but in any case, within one (1) month of placing the order and arrangement of payment modalities.

GCC 14.1 — the Contractor is required to provide / install patches and updates pertaining to software solutions developed from time to time, to cater for any bug or add

some feature / improvement to the software tools, under the Contractor's liability for the entire duration of the warranty free of cost.

10. **Warranty (GCC Clause 15)**

GCC 15.2—The warranty period shall be 12 months from date of commissioning of equipment. The Contractor shall, in addition, comply with the performance and/or consumption guarantees specified under the Contract. If, for reasons attributable to the Contractor, these guarantees are not attained in whole or in part, the Contractor shall, at its discretion, either:

- (a) make such changes, modifications, and/or additions to the Goods or any part thereof as may be necessary in order to attain the contractual guarantees specified in the Contract at its own cost and expense. The Contractor will be responsible for the boarding, lodging and travel expenses of the maintenance staff during the warranty period.

GCC 15.4 & 15.5 — The period for correction of defects in the warranty period is thirty (30) days from the return date of the defective Goods in the Contractor's premises. Including transport, the repair time duration shall not exceed thirty (30) days.

11. **Payment (GCC Clause 16)**

GCC 16.1—The method and conditions of payment to be made to the Contractor under this Contract shall be as follows:

- a) **Advance Payment:** Ten (10) percent of the Contract Price shall be paid upon submission of an Advance Bank Guarantee, at the time of contract award.
- b) **Factory Acceptance Test (FAT):** Twenty (20) percent of the Contract Price shall be paid upon successful completion of the Factory Acceptance Test (FAT), along with submission of commercial invoice.
- c) **Payment on Delivery:** Fifty (50) percent of the Contract Price shall be paid upon successful delivery of Goods/Equipment at the procuring agency's premises and submission of a commercial invoice. This payment will also trigger the release of the Advance Bank Guarantee.
- d) **Site Acceptance Test (SAT) / Local Training:** Twenty (20) percent of the Contract Price shall be paid upon successful completion of the Site Acceptance Test (SAT), local training, and submission of a commercial invoice.
- e) **Completion of Warranty Period:** Upon successful completion of the warranty period, the Performance Guarantee shall be released.

All Payments shall be made in Pakistani Rupees.

12. **Delays in the Contractor's Performance (GCC Clause 20)**

GCC 20.1 – The time for the completion of the facilities including delivery of Goods, training and performance of services under the contract shall be 06 (Six) months from the date of award of contract.

13. Liquidated Damages (GCC Clause 21)

GCC 21.1—Applicable rate: 0.5% (half percent) of the Contract Price per week will be deducted for liquidated damages, if the Contractor fails to attain completion of facilities or any part thereof, within the time for completion.

Maximum deduction: Ten percent (10 %) of the Contract Price

14. Settlement of Disputes (GCC Clause 26)

GCC 26.2.2—The rules of procedure for settlement of dispute as per GCC subsection 26.

15. Applicable Law (GCC Clause 28)

GCC 28.1—The Contract shall be interpreted in accordance with the laws of the Islamic Republic of Pakistan.

16. Notices (GCC Clause 29)

GCC 29.1—Procuring Agency address for notice purposes:

Project Officer (NFMMS)
FAB Headquarters, Plot No. 112, Sector H-10/4 Islamabad
Postal Code 44000, Islamabad, Pakistan
Telephone: +92-51-9257892 Fax: +92-51-9257595
Email: projectnfmms@fab.gov.pk

Contractor's address for notice purposes:

Annexures

ANNEX - A**LETTER OF INTENT**

[Location, Date]

To:

Project Officer (NFMMS)
 Frequency Allocation Board
 HQs, H-10/4, Islamabad, Pakistan

Sir,

I/We, the undersigned, offer to Supply and Commissioning of Spectrum Monitoring System for Establishment of Islamabad Monitoring Station Housing FAB HQs Building in accordance with your Bidding Document and our Proposal. I/We hereby submit our Proposal for Lot No. ____ which includes separately sealed **Technical Proposal** and **Financial Proposal** along with bid security in a sealed envelope as per following: -

Lot No.	Amount (PKR)
i	8,000,000/-
ii	2,000,000/-

I/We, undertake that all specification requirements mentioned in the Bidding Document have been fully responded in the Technical Proposal.

Our Proposal is binding upon us and cannot be modified after the submission. We undertake, if our bid is accepted, to complete the project within the specified time stated in the bidding document.

If our bid is accepted, we undertake to provide a performance guarantee in the form, in the amounts, and within the time specified in the bidding documents.

I/We understand you are not bound to accept our Proposal.

Yours,

Authorized Signature:

Name and Title of Signatory:

Name of Firm:

Address:

Cell:

Tel:

Fax:

Email:

(Must be Printed on Rs. 100/- or Above Stamp Paper)

BLACK-LISTING CERTIFICATE

IT IS CERTIFIED THAT M/s _____ HAS NOT BEEN BLACK-LISTED BY ANY PUBLIC OR PRIVATE SECTOR ORGANIZATION IN PAKISTAN.

Name: _____

Authorized Person : _____

Address : _____

Tel #: _____ Mobile #: _____ Fax #: _____

Email : _____

Signature : _____ Dated : _____

ATTESTED BY NOTARY PUBLIC

ANNEX - C**DETAILS OF LOCAL PARTNERS/AUTHORIZED DEALERS/SUPPLIER**

General: < In addition to the questions and forms in this section, take as much space as desired for your responses. >

Number of Local Partners/Authorized Dealers/Supplier in Pakistan: _____

Using the format below, provide information on each local partner/authorized dealer/supplier of your tool in Pakistan

Name of firm of Local Partner/Supplier/Dealer

Address

NTN Number

Name listed in ATL (YES/NO)

Date of Engagement with the Bidder's Firm

Nature of engagement with the Bidder's Firm

Name of Clients being Served in Pakistan by the above mentioned local Partner/Supplier/Dealer

Areas (Region) of Pakistan being served by the local partner/Authorized dealer/Supplier

Registration Documents as a Firm/Company

Details of POCs for Local Partner/Authorized Dealer/Supplier

Ser.	Name	Designation	CNIC	Mobile Number	Landline Number	Email

Bidder's Name: _____

Signature:

Date:

The Bidder Firm's References**Supply of Similar Tools to Regulators/Vendor/Operators/Industry/R&D Organization That Best Illustrate Expertise****(Attach documentary proof)**

General: < In addition to the questions and forms in this section, take as much space as desired for your responses. >

Using the format below, provide information on each assignment for which your firm/entity, either individually or as a corporate entity was legally contracted.

Name of Client	
Type of Client (Regulator/Vendor/Operator)	
Country	
Type of Tool Provided with Version	
Quantity of tools provided	
Cost of project (at least PKR 25 million)	
Date of Provision of Equipment	
Details of Services Provided, if any	

Firm's Name: _____

ANNEX - E**PRICE SCHEDULE/BILL OF QUANTITY (BoQ)**

Sample detail of the equipment is given below, however, the bidder can include the details as per the nature of the solution:-

S. No	Description	Total Qty	Unit Price	Total Quoted Price (PKR) Inclusive of all applicable taxes
1.	Equipment			
2.	Operational and Maintenance Training on each equipment at the premises of the procuring agency Operation training in class Number of participants = 25 Venue = FAB HQ	Job		
	Total Price (inclusive of all taxes)			
Name of Bidder _____ Signature of Bidder _____				

- Bidders must submit separate financial bids against each lot and financial evaluation of each lot will be conducted separately.
- The bidder shall indicate on the appropriate Price Schedule/Bill of Quantities (BOQ) total bid price of each lot i.e. lot (i & ii) it proposes to supply, especially the unit price of test mobile phone of lot – i.

FORM OF CONTRACT

THIS AGREEMENT made the _____ day of _____ **2025** between (name of procuring agency) of (country of procuring agency) (hereinafter called “the procuring agency”) of the one part and (name of Supplier) of (city and country of supplier) (hereinafter called “the Supplier”) of the other part:

WHEREAS the procuring agency invited bids for certain Equipment, viz., (brief description of Equipment) and has accepted a bid by the supplier for the supply of those Equipment in the sum of (contract price in words and figures) (hereinafter called “the Contract Price”).

NOW THIS AGREEMENT WITNESSED AS FOLLOWS:

1. In this Contract, the words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents shall be deemed to form and be read and constructed as part of this Contract, viz:
 - (a) Invitation to Bid;
 - (b) Bidding Documents;
 - (c) Form of Contract;
 - (d) The Bid Form and Price Schedule submitted by the Bidder;
 - (e) The schedule of Requirement;
 - (f) The Technical Specifications;
 - (g) Bid Security;
 - (h) Performance Guarantee;
 - (i) Advance Bank Guarantee
 - (j) The General and Special Conditions of Contract;
 - (k) The procuring agency’s Notification of Award.
3. In consideration of the payments to be made by the procuring agency to the Supplier as herein after mentioned, the Supplier hereby covenants with the procuring agency to provide the Goods/Equipment and to remedy defects therein in conformity in all respects with the provisions of the contract.
4. The procuring agency hereby covenants to pay the Supplier in consideration of the provision of the Equipment and the remedying of defects therein, the contract price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN Witnesses whereof the parties hereto have caused this Contract to be executed in accordance with their respective laws the day and year first above written.

PARTIES:

For and on behalf of the 'procuring agency' For and on behalf of the '**Supplier**'

Name:

Name:

Designation:

Designation:

CNIC:

CNIC:

WITNESSES:

Name:

Name:

Designation

Designation:

CNIC:

CNIC:

FORM OF PERFORMANCE GUARANTEE**Performance Guarantee for Advance Obligations**

Date:-----

_____ [On a legal document/stamp paper]

Beneficiary: Frequency Allocation Board (FAB), Headquarters Plot No. 112, H-10/4, Islamabad, Pakistan.

Date: _____

We, [name of Bank] are providing Performance Guarantee for _____ (hereinafter called "the Supplier") have entered into CONTRACT No. [Reference number of the CONTRACT] dated [insert date] with Frequency Allocation Board (FAB) (hereinafter called the "procuring agency"), for the provision of **Supply and Commissioning of Spectrum Monitoring System for Establishment of Islamabad Monitoring Station Housing FAB HQs Building** (hereinafter called "the CONTRACT").

Furthermore, we understand that, according to the conditions of the CONTRACT, a Performance Guarantee in the sum of PKR _____ / [PAK RUPEE _____] (the amount equal to **10%** of the total CONTRACT Price) is to be made against the advance obligations of the Supplier.

We [name of Bank] hereby irrevocably, unconditionally and continuingly guarantee without recourse to the procuring agency, and undertake to pay to the procuring agency any sum or sums not exceeding in total an amount of PKR _____ / PAK RUPEE _____ only) (the amount equal to 10% of the total CONTRACT Price) upon receipt by us of procuring agency's first demand in writing accompanied by a written statement stating that "the Supplier" is in breach of their obligations under the CONTRACT.

This guarantee shall be released after successful completion of the CONTRACT.

[signature(s)]

Endorsed and guaranteed by Commercial Bank in Pakistan

[Bank Stamp & Signature(s)]

The expiry date of this guarantee will be twelve months from the start date of the CONTRACT.

FORM OF ADVANCE BANK GUARANTEE**Advance Bank Guarantee for Advance Obligations**

Date:-----

_____ [On a legal document/stamp paper]

Beneficiary: Frequency Allocation Board (FAB), Headquarters Plot No. 112, H-10/4, Islamabad, Pakistan.

Date: _____

We, [name of Bank] are providing Advance Bank Guarantee for _____ (hereinafter called "the Supplier") have entered into CONTRACT No. [Reference number of the CONTRACT] dated [insert date] with Frequency Allocation Board (FAB) (hereinafter called the "procuring agency"), for the provision of **Supply and Commissioning of Spectrum Monitoring System for Establishment of Islamabad Monitoring Station Housing FAB HQs Building** (hereinafter called "the CONTRACT").

Furthermore, we understand that, according to the conditions of the CONTRACT, an Advance Bank Guarantee in the sum of PKR _____/ [PAK RUPEE _____] (the amount equal to 10% of the total CONTRACT Price) is to be made against the advance obligations of the Supplier.

We [name of Bank] hereby irrevocably, unconditionally and continuingly guarantee without recourse to the procuring agency, and undertake to pay to the procuring agency any sum or sums not exceeding in total an amount of PKR _____/ PAK RUPEE _____ only) (the amount equal to 10% of the total CONTRACT Price) upon receipt by us of procuring agency's first demand in writing accompanied by a written statement stating that "the Supplier" is in breach of their obligations under the CONTRACT.

This guarantee shall be released after successful delivery of goods / equipment at procuring agency's premises.

[signature(s)]

Endorsed and guaranteed by Commercial Bank in Pakistan

[Bank Stamp & Signature(s)]

The expiry date of this guarantee will be twelve months from the start date of the CONTRACT.

INTEGRITY PACT**DECLARATION OF FEES, COMMISSION AND BROKERAGE
ETC.
PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES &
WORKS IN CONTRACTS WORTH RS. 10 MILLION OR MORE**

Contract Number:

Dated:

Contract Value: Rs:

Contract Title:

M/s _____ hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Pakistan or any administrative subdivision or agency thereof or any other entity owned or controlled by it (GoP) through any corrupt business practice.

Without limiting the generality of the foregoing **M/s** _____ represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder's fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP, except that which has been expressly declared pursuant hereto.

M/s _____ Certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with GoP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

M/s _____ accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other right and remedies available to GoP under any law, contract or other instrument, be voidable at the option of GoP.

Notwithstanding any rights and remedies exercised by GoP in this regard, **M/s** _____ agrees to indemnify GoP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GoP in an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by **M/s** _____ as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GoP.

(procuring agency)

M/s _____ [Supplier]

Guideline for Technical Evaluation Procedure - Lot (i)
Digital RF Receivers (Analyzers)

Part F → Availability of Proposed System

Sr No.	Domain	Description	Criteria
37	Availability & Physical Inspection of Proposed Monitoring Equipment	Availability of proposed monitoring equipment (having full capabilities / features and proposed/ latest version of operating software and firmware) along with all accessories before test & trial within the prescribed timeline. Same will be inspected and graded as under: - (a) Main unit (b) Minimum 2 x Smart Test phones (c) Laptop with Control software (latest version) (d) Complete Antenna System (e) Batteries and Complete Back Pack System	1 mark each

Validation Steps:

1. Bidder to ensure availability of proposed monitoring equipment as per details mentioned below:-

Bidder Details:

Bidder Name: _____

Bidder Representative: _____
(with designation)

Date: _____

Proposed System Details:

<p><u>Digital RF Receiver</u></p> <ul style="list-style-type: none"> a. Equipment Name b. Brand c. Serial No d. Model No e. Firmware No f. Built in GPS (Yes/No) 	<p><u>Antenna:</u></p> <ul style="list-style-type: none"> a. Antenna Type b. Brand c. Model No d. Serial No e. Antenna Specification Sheet f. Antenna Cable length
<p><u>Mobile Phone:</u></p> <ul style="list-style-type: none"> a. Brand Name b. Model No c. Specification d. Technologies Supported e. Firmware f. Routed Phone g. Mobile Qty h. Measurement Software Details 	<p><u>Laptop:</u></p> <ul style="list-style-type: none"> a. Brand Name: b. Model No c. Specification d. Windows e. Measurement Software f. Post processing Software
<p><u>GPS:</u></p> <ul style="list-style-type: none"> a. Brand b. Model c. Band Supported 	<p><u>Batteries:</u></p> <ul style="list-style-type: none"> a. Battery Type b. Brand c. Specification d. Swappable e. Battery Qty f. Backup time
<p><u>Backpack:</u></p> <ul style="list-style-type: none"> a. Brand b. Model c. Handset Installation Capacity d. Battery Bank Backup time 	

Note:

All software and firmware versions should be latest and licensed. No trial version will be accepted

Part A → Mandatory Requirements

Non-Compliant to any mandatory parameter, the bidder will be technically disqualified

Sr No.	Domain	Description
1	Type of Equipment	Compact size with backpack or suitcase bag housing for operations
		Portable/transportable and easy to carry for drive test and walk-test monitoring
		Built-in GPS, storage and remote connectivity features

Validation Steps:

- Bidder to present **entire system as it would be used in the field**, including:
 - Scanner
 - Laptop
 - Batteries
 - Antennas
 - Test Phones
 - Backpack / suitcase
- Asking the operator to:
 - Wear the backpack or carry the suitcase
 - Walk continuously for **50–100** meters and operate system while walking
- Weighing the **complete system** (backpack/suitcase).
- Enable remote connectivity through LAN or WiFi.

Sr No.	Domain	Description
2	Technology support	The equipment shall have support for 5G NR (FDD/TDD), GSM, UMTS, HSDPA, HSUPA, HSPA+, LTE, LTE-Advance (FDD & TDD), NB-IoT/Cat NB1 (i.e. 2nd , 3rd, 4th, 5th Generation wireless technologies)

Validation Steps:

- Start **blind scan** (no RAT pre-selection)
- Observe detected technologies in ACD view and in measurement log files.
 - 5G (TDD & FDD)
 - LTE (TDD & FDD)
 - UMTS
 - GSM
 - NB-IoT/Cat N
- Manually Configure any of the above-mentioned technologies and validate technology detection capabilities.

Sr No.	Domain	Description
3	Decoding capability of Digital RF Receiver (Analyzer)	Decoding of System Information (SI), System Information Block (SIB), Master Information Block (MIB) and Layer-3 messages of all mentioned cellular technologies without using SIM card

Validation Steps:

1. Select a detected cell and Open layer 3 message's view during drive test in real time.
 - a. 5G → Verify MIB and SIBs messages (All SIBs)
 - b. UMTS & LTE → Verify MIB and SIBs (All SIBs)
 - c. 2G → Verify System Information SI1 – SI 13, Paging request, Channel request/assignment (SDCCH/TCH)

Part B → Digital RF Receiver (Analyzer) Capabilities

Sr No.	Domain	Description	Criteria
5	Equipment weight	Compact Size including backpack or suitcase bag housing for operation	If ≤ 10kg = 1 Mark If > 10kg = 0.5 Mark

Validation Steps:

1. Weighing the **complete backpack/suitcase system** including the main unit with all batteries and all associated accessories such as RF cables, antennas and test mobile phones.

Sr No.	Domain	Description	Criteria
6	Frequency range	Support for RF Spectrum Scan for all cellular technologies (5G,4G,3G,2G) in following spectrum bands: - <ul style="list-style-type: none"> • Frequency range (350 MHz – 8 GHz) • Frequency range (24 GHz – 40 GHz or above) 	Support for following frequency bands will be awarded marks as under: <ul style="list-style-type: none"> · Frequency range (350 MHz – 6 GHz) = 1.5 Mark · Frequency range (6 GHz – 8GHz) = 1 Mark · Frequency range (24 GHz – 40 GHz or above) = 1 Mark

Validation Steps:

1. Run RF Spectrum Scan and verify following frequency ranges:
 - a. 350 MHz – 6 GHz
 - b. 6 GHz – 8GHz
 - c. 24 GHz – 40 GHz or above

} *Signal generated
by Signal generator*

2. This capability applies to Main Unit, Control Software and supported Antennas

Sr No.	Domain	Description	Criteria
7	Measurement Capabilities	Auto-detection and monitoring of multiple cellular technologies (all released versions) simultaneously (5G, 4G, 3G, 2G)	Monitor 4 x technologies (5G,4G,3G,2G) = 8 Marks (2 Marks for each technology)

Validation Steps:

1. Conduct drive test in **Islamabad** and initiate blind scan (no RAT pre-selection) and RF Spectrum Scan
2. Observe frequency bands and corresponding technologies for each active operator (**Local & Cross Border Spillover**) in ACD view and in measurement log files
3. Failure to detect or decode any active frequency band transmission of any Operator (local or foreign) within drive test area/locations shall be considered as failure to detect and decode the corresponding technology (5G,4G,3G,2G)

Sr No.	Domain	Description	Criteria
8	Measurement Capabilities	Coverage measurement of the cellular technologies (Log file recording and plotting on maps)	Yes = 2 Marks No = 0 Marks

Validation Steps:

1. Conduct walk/drive test in **Islamabad** and record measurement file (log file)
2. Plot cellular coverage maps (from measurement file). Color-coded operator wise coverage analysis, with mapping of individual frequency bands and corresponding radio access technologies

Sr No.	Domain	Description	Criteria
9	Measurement Capabilities	All Protocol Testing of 3GPP Standards (e.g. Rx Level, C/I, RSCP, Ec/No, RSRP, RSRQ, SS-RSRP, SS-RSRQ, SINR, RSSI, CIR etc.)	Yes = 2 Marks No = 0 Mark

Validation Steps:

1. Conduct Drive test in Islamabad.
2. Bidder to display all 3GPP standard protocols both in real time & Post Processing including but not limited to:

5G	LTE	UMTS	GSM
SS-RSRP	RSRP	RSCP	Rx Level
SS-RSRQ	RSRQ	Ec/No	Rx Quality
SS-SINR	RSSI	RSSI	C/I Ratio
	SINR	SIR	SQI
	CQI		

Sr No.	Domain	Description	Criteria
10	Measurement Capabilities	Measurement and analysis of beamforming in 5G technology	Yes = 2 Marks No = 0 Mark

Validation Steps:

1. Conduct drive test in **Islamabad**.
2. Open beam analysis view and observe:
 - a. Beam ID (SSB Index)
 - b. Beam wise (RSRP, RSRQ SINR)

Sr No.	Domain	Description	Criteria
11	Measurement Capabilities	Capable to measure and detect synchronization problem in TDD bands of 5G and LTE technologies	1 mark for each technology

Validation Steps:

1. Conduct drive test in **Islamabad**.
2. Bidder to show frames ToA (PPS) and Frame alignment visualization
3. Look for Time alignment error (if any) which is numerically displayed (μ s)

Sr No.	Domain	Description	Criteria
12	Measurement Capabilities	5G and LTE TDD Radio Frame Structure Level scanning information	1 Mark each for following levels information: a) Frame b) Sub Frame c) Slot d) Symbol

Validation Steps:

1. Bidder to show frame, subframe, slot, and symbol information of all detected cells (TDD Technology)

Sr No.	Domain	Description	Criteria
13	Collection of Real Time Correlatable Data through Simultaneous Operation of RF Receiver and Smart Test Phones	The provided solution should be capable to simultaneously collect real time data from the devices i.e., Digital RF receiver (analyzer) and multiple smart test phones operational in parallel during the drive/walk test	Yes = 3 Marks No = 0 Mark

Validation Steps:

1. Initiate scanner and test phone measurement testing simultaneously during drive test in Islamabad
2. Scanner shall be capable of detecting and decoding all Cell IDs identified by the test handsets during the drive test.

Sr No.	Domain	Description	Criteria
14	System Support	Flexibility and support to add more test phones	Yes = 2 Marks No = 0 Mark

Validation Steps:

1. Bidder to practically demonstrate the procedure of how to add additional test phones in future within backpack.
2. The backpack design must include designated spaces for main unit and interfaces to accommodate and securely integrate additional test devices.

Sr No.	Domain	Description	Criteria
15	System Support	Capable to perform Quality of Service (QoS) measurements of cellular services in in-door/walk test and outdoor/drive test.	Yes = 2 Marks No = 0 Mark

Validation Steps:

1. Conduct Drive/walk test in **Islamabad**.
2. Bidder to show following QoS parameters in software controlled mode.

Voice (CS or VoLTE)	Network Accessibility, call setup success rate, call setup time, call drop rate, Inter System Handover (ISHO) for CS Voice, MOS, RAB setup success rate, Call completion ratio
Data	Throughput (DL/UL), UL/DL Throughput (Fixed Size file) latency, jitter, packet loss, webpage loading time, Trace Route Test (TCP, UDP, ICMP), iPerf3(TCP, UDP)
Video	Start delay, buffering events, stalling ratio, VMOS
Messaging	SMS, Success rate, End to end delivery time

Sr No.	Domain	Description	Criteria
16	Batteries	System battery backup time per pack	Battery backup time > 3 Hr = 2 Marks Battery backup time < 3 Hr = 1 Mark

Validation Steps:

1. Battery backup time will be evaluated through simultaneous operation of the main unit and all connected test handsets

Sr No.	Domain	Description	Criteria
16	Batteries	Spare Battery Pack	Spare Battery backup time > 3 Hr = 2 Marks Spare Battery backup time < 3 Hr = 1 Marks No Spare Battery = 0 Mark

Validation Steps:

1. Check availability and backup of spare battery pack through simultaneous operation of the main unit and all connected test handsets

Part C → Test Mobile Phones Capabilities

Sr No.	Domain	Description	Criteria
17	Type	Smart test phone based on android operating system 15 or better	Yes = 2 Mark No = 0 Mark

Validation Steps:

1. Check Android version of smart test phone

Sr No.	Domain	Description	Criteria
18	Operating Mode	It shall possess the capability to conduct Voice, SMS, Video, and Data testing in both standalone mode and software-controlled mode	Testing possible in standalone mode = 1 Mark Testing possible in software-controlled mode = 1 Mark

Validation Steps:

1. Test Phones must be able to initiate, receive, and measure following in both standalone and Non-Standalone Mode:

Voice	Call setup, drop, quality (MOS), codecs etc.
SMS	MO/MT success, delay, failure etc.
Video	Video call setup, quality (VMOS) etc.
Data	Throughput, latency, packet loss etc.

Sr No.	Domain	Description	Criteria
19	Voice (2G/3G/VoLTE/VoNR) Testing	Capable to perform Voice (2G/3G/VoLTE/VoNR) testing	If Voice (2G/3G/VoLTE/VoNR) testing possible = 0.25 Mark each If device support voice KPI parameters as defined in Para: 2.3.4, SECTION-4 (Part-B) of bidding document = 1 Mark

Validation Steps:

1. Test Phones must be able to initiate and receive voice calls.

2. Verify KPI parameters support as defined in Para: 2.3.4, SECTION-4 (Part-B) of RFP in both standalone and Non-Standalone Mode.
3. **POLQA (ITU-T P.863) Testing**
 - a. Ask the bidder where the algorithm runs handset or control software
 - b. Initiate CS voice call for POLQA testing or VoLTE, VoNR call for POLQA testing and the bidder to show
 - i. Codec used (AMR-NB / AMR-WB / EVS)
 - ii. MOS output after call ends

Sr No.	Domain	Description	Criteria
20	Video Testing	Capable to perform Video Testing	If video testing possible = 1 Mark If device support video KPI parameters as defined in Para: 2.3.4, SECTION-4 (Part-B) of bidding document = 1 Mark.

Validation Steps:

1. Test Phones must be able to initiate video testing in both standalone and Non-Standalone Mode.
2. Verify KPI parameters support as defined in Para: 2.3.4, SECTION-4 (Part-B) of RFP in both standalone and Non-Standalone Mode.

Sr No.	Domain	Description	Criteria
21	Data Testing	Capable to perform Data Testing	If data testing possible = 1 Mark If device support data KPI parameters as defined in Para: 2.3.4, SECTION-4 (Part-B) of bidding document = 1 Mark

Validation Steps:

1. Test Phones must be able to generate data traffic in both standalone and Non-Standalone Mode.
2. Verify KPI parameters support as defined in Para: 2.3.4, SECTION-4 (Part-B) of RFP in both standalone and Non-Standalone Mode.

Sr No.	Domain	Description	Criteria
22	Locking /Unlocking Feature	Test phones shall be capable to lock/unlock any of following desired parameters for QoS test: <ul style="list-style-type: none"> · Specific technology (2G,3G,4G,5G) · Cell ID/PCI/NCI/PSC/BCCH · Channel Number (ARFCN, UARFCN, EUTRA, EARFCN, NR-ARFCN) 	Technology lock/unlock feature = 0.5 Mark Cell ID lock/unlock = 0.5 Mark Channel Number Lock/unlock = 0.5 Mark

Validation Steps:

1. Perform drive test by locking test phone on technology, Cell ID or channel number

Sr No.	Domain	Description	Criteria
23	Carrier Aggregation	Support for carrier aggregation (Intra-band & Inter-band) testing	Intra-band, contiguous= 0.5 Mark Intra-band, non-contiguous= 0.5 Mark Inter-band= 0.5 Mark

Validation Steps:

1. Lock handset to LTE and start data session and verify PCC and SCC.

Type	Band Information	Description
Intra-band Contiguous	CA_7B, CA_40C	Adjacent carriers in the same band.
Intra-band Non-contiguous	CA_3A-3A, CA_n77	Same band, but a gap exists.
Inter-band	CA_1A-5B	Different bands (e.g., Band 1 + Band 5).

Sr No.	Domain	Description	Criteria
24	OTT Applications Testing	Facebook, WhatsApp, Instagram, YouTube	0.25 mark for each of the 4 x applications

Validation Steps:

1. Test Phones must be able to initiate OTT Application testing in Standalone Mode

Part D → Control Software

Sr No.	Domain	Description	Criteria
25	Third party device support	Software shall have support for multiple devices of different vendors (i.e., smartphones, modems, router, CPE etc)	Yes = 2 Mark No= 0 Mark

Validation Steps:

1. Bidder to provide documentary evidence and clarification regarding support for third party device support

Sr No.	Domain	Description	Criteria
26	Measurement Options	Interference identification in cellular networks	1 Mark for each
		Support for New and evolving application tests i.e., TWAMP Protocol in 5G networks. Interactivity test measuring key parameters such as round-trip latency, packet delay variation, packet error rate and proofing bit rate in one single test with millisecond accuracy	
		Capability and flexibility to lock/unlock any desired technologies on test phones	

Validation Steps:

1. Interference identification in cellular networks during drive test by correlating RF power scan and Signal quality metrics.
2. Locking/Unlocking flexibility of test phones through Control Software.
3. TWAMP Protocol testing by measuring key parameters such as round-trip latency, packet delay variation, packet error rate and proofing bit rate

Sr No.	Domain	Description	Criteria
27	GUI Inter- face	User friendly GUI interface	1.5 Mark each
		Data visualization in table, graph, bar chart, line chart, pie chart etc	
		Option to create custom workspaces	

Validation Steps:

1. GUI interface should be user-friendly:
 - a. Easy navigation & Clear, unambiguous labels and icons
 - b. Single-click start/stop controls
2. Data visualization should be available in the form tables, graphs and charts.
3. Custom workspace option should be available

Sr No.	Domain	Description	Criteria
28	Display Options	Software shall be capable to display, record, pause and replay the measurements	0.5 mark for each
		Indicate the faults in the run time using audio/visual display	
		Displaying alarm and notifications failure events like call drop, blocked call etc	
		Displaying the progress of testing in the run time	
		Displaying and ranking (Top N) of all detected channels along with identifier code (MCC/MNC), signal strength, signal quality, frequency, channel number and channel quality in real time	
		Display option for RF spectrum power and waterfall in parallel windows	
		Display different parameter in grid and map and the legends should be configurable.	
		Display the status of the connected/disconnected devices.	
		Decoding and Display all following active cells layer 3 messages for cellular technologies in real time: <ol style="list-style-type: none"> a) System Information (SI) b) System Information Block (SIB) c) Master Information Block (MIB) 	1 mark each (Total = 3 marks)

Validation Steps:

1. Bidder to demonstrate and display:
 - a. Measurement file record, pause and replay option
 - b. Devices unplug error, temperature indication, battery indications etc.
 - c. Notifications for events i.e., blocked call, drop call, connected call, successful call etc.
 - d. Top N view of all detected channels along with identifier code (MCC/MNC), signal strength, signal quality, frequency, channel number and channel quality during drive test in real time

- e. Display option for RF spectrum scan and waterfall during simultaneous measurements in parallel windows without any interruption.
- f. Status of all connected devices
- g. Display different parameter in grid and map and the legends should be configurable.
- h. Decoding and display all active cells layer 3 messages including System information (SI), System Information Block (SIB) and Master Information Block(MIB) in real time during drive test

Sr No.	Domain	Description	Criteria
29	Advanced 5G NR measurements (Standalone and Non-Standalone Configurations) including Reduced Capability Analysis (RED CAP)	Software shall be capable to display feature for Identification of Network Slicing and reduced capability analysis during scanning/decoding of 5G technology	Yes = 1 mark No = 0 mark

Validation Steps:

1. REDCAP Identifier(Enable/Not enable)
2. For Network Slicing bidder to show:
 - a. S-NSSAI (Single Network Slice Selection Assistance Information)
 - i. SST (Slice/Service Type) → Standardized values (0-127) define slice types and SD (Slice Differentiator)

Sr No.	Domain	Description	Criteria
30	Time Domain Measurements and Analysis in 5G and 4G TDD Technologies	Time-gate feature for identification of interference in 5G and 4G TDD technologies	Feature Available in Real Time Scanning of Data = 5 Mark Feature Available in Post Processing of Data = 2 Mark

Validation Steps:

1. Bidder to demonstrate this feature by manually generating interference in LTE TDD and 5G bands to create a real-world scenario.
2. Time Gate feature is performing real time RF signal isolation (UL/DL/Flexible slots) and guard period in the time domain, followed by FFT-based spectral analysis converting the gated time-domain signal into a frequency-domain spectrum, enabling clear and direct identification of interference sources or performing the same Time Gate Feature in post processing (Recording measurements during drive test and then identifying the presence of interference)

Sr No.	Domain	Description	Criteria
31	GIS/GEO Mapping/Route Navigation	Recording and displaying measurement drive test results on digital Google / Openstreet Maps	Yes = 2 Mark No = 0 Mark

Validation Steps:

1. Bidder to demonstrate GIS/GEO or Route Navigation mapping option for recording and displaying measurement results on digital maps

Sr No.	Domain	Description	Criteria
32	Import and export data	Data import options in CSV, KML/KMZ, Google maps, indoor floor maps of building etc.	Import of data = 1 Mark
		Any parameter can be exported in csv, tab, txt, KMZ/KML	Export of data = 1 Mark

Validation Steps:

1. Bidder to demonstrate data import capability in the presence of TEC members ensuring seamless data import and its effective utilization for post-processing analysis.
2. Bidder to demonstrate the data export capability in the presence of TEC members, and the exported dataset shall be handed over immediately after the drive test to enable independent post-processing analysis and verification

SIGNATURES & ACKNOWLEDGEMENT

Bidder Representative

I hereby confirm that the field tests/trials were conducted using the proposed equipment and software, and that the demonstrations were performed to the best of my knowledge in accordance with the requirements communicated by FAB.

Name: _____

Designation: _____

Company / OEM: _____

Signature: _____

FAB Evaluation Committee

The undersigned members of the FAB Evaluation Committee confirm that the field tests and trials were observed and evaluated in accordance criteria and testing procedures defined in RFP and in this document respectively

Sr No	TEC Member	Signatures
1	Name: Designation:	
3	Name: Designation:	
3	Name: Designation:	
4	Name: Designation:	

Guideline for Technical Evaluation Procedure - Lot (ii)

RF Sensors System

1. Introduction

The purpose of this document is to define the test and trial procedure for field evaluation of the proposed RF Sensors / Monitoring System under Lot (II), in accordance with Section 3, Clause 1.8 of the RFP. The procedure aims to verify mandatory technical, operational, and functional requirements through practical field demonstration.

2. Authority and Applicability

The test and trial procedure, test scenarios, and evaluation methodology shall be defined by the Procuring Agency. The bidder shall provide the proposed equipment with full capabilities and latest operating software and shall extend all necessary technical support during the trial period.

3. Mandatory Nature of Test and Trial

Compliance with this test and trial procedure is mandatory. Failure to successfully demonstrate any mandatory requirement during the test and trial shall result in the system being declared Non-Compliant and may lead to technical disqualification.

4. Documentation and Record of Evidence

All observations, measurements, screenshots, logs, recordings, and other supporting materials generated during the test and trial shall be properly documented. All such evidence shall be compiled and attached as annexures to this Test and Trial document and shall form an integral part of the evaluation record.

5. Bidder information

- a. Bidder Name:
- b. Bidder Representative/s with designation:
- c. Date and Time:

6. Part A: Test and Trial (Mandatory)

i. Type of Equipment

S#	Requirement	Test Scenario	Test Procedure	Compliant / Non-Compliant	Remarks
a.	Compact size	Hand-carried operation	System to be carried and operated by a single operator without assistance.		
b.	Portable and easy to carry (Single Operator)	Drive Test & On-foot operation	Drive Test: Single operator performs system operation from within vehicle. On-Foot: Single operator carries system, changes screening/display modes and handles directional antenna simultaneously.		
c.	Built-in GPS & Internal Storage	Verify that GPS functionality and internal storage are natively integrated within the receiver or antenna system. Any separate, external, or add-on GPS solution shall be treated as non-compliant.	Physically demonstrate that the GPS is part of system as described in scenario.		
d.	Data transmission via wired LAN	Verify successful data transfer through wired LAN interface.			
e.	Frequency Range: Less or equal to 9 kHz and greater or equal to 8 GHz	Frequency range will be verified by receiving signals across frequency bands spanning from 9 kHz to 8 GHz.	The range will be tested from signal generator or through signal presence in the field.		

ii. Interference analysis in TDD/ FDD frequency bands of 5G/4G

S#	Requirement	Test Scenario	Test Procedure	Compliant / Non-Compliant	Remarks
a.	Power vs Time display	Show the screen, Complete frequency range	Show the signal; Power vs time		
b.	Power vs Frequency display		.Display the signals; Power vs Freq Display		
c.	Persistence Display	Controlled interference signal will be generated in 5G TDD Network as follows; (i) Continuous	Verify real-time visibility of interference signal in 5G TDD transmission.		

S#	Requirement	Test Scenario	Test Procedure	Compliant / Non-Compliant	Remarks
		(ii) Intermittent Burst			
d.	Zero Span Mode	Will be tested in 5G/4G TDD/FDD Network	Verify Zero Span functionality, where the system must show the TDD/FDD signals Power level with respect to time.		
e.	Signal detection of 5G networks from 700 MHz to 8 GHz	The test will be performed in the field	Signal detection of 5G networks within the 700 MHz to 8 GHz range will be evaluated through field testing, covering all available FDD and TDD 5G networks present in the environment.		
f.	Time-Gate feature for 4G/5G TDD	Controlled interference signal will be generated in 5G TDD Network as follows; (i) Continuous (ii) Intermittent (iii) Burst	Display the interfering signal in a 5G TDD network in real time, indicating whether it is in the uplink or downlink, along with capability for homing of the interferer.		

iii. Field Test and Trials/ Practical Demonstration of Proposed System

S#	Test Name	Test Result	Scans	Remarks
i.	Occupancy Measurement			
	a. Frequency Range			
	b. No of Signals Detected			
ii.	Service Parameter Analysis			
	a. Service Name			
	b. Frequency Spot			
	c. Signal Level			
	d. Bandwidth			

	e. Direction/degree of Transmitter on Map			
iii.	Interference Analysis			
	a. Frequency Range/Spot			
	b. Interference Detection			
	c. Interferer Homing			

7. Part B: RF Sensors System Capabilities

Evaluation and scoring shall be carried out through mandatory test and trials, wherever applicable. **For tests requiring laboratory equipment, such as oscillators or other test instruments, the bidder shall provide the necessary test facilities, wherever applicable or feasible**

S#	Domain	Description	Criteria	Test Result	Remarks
a.	Type of Equipment	Lightweight handheld ruggedized and weather proof compact size monitoring sensor	If $\leq 08\text{kg}$ = 1 Mark If $> 08\text{kg}$ = 0.5 Mark		
b.	Frequency range	Signal detection shall be evaluated from 9 kHz to 8 GHz. Detection from 9 kHz–20 MHz shall be performed using an omnidirectional (rod) antenna, while from 20 MHz–8 GHz, detection (via offered omni/directional antenna) and homing/direction finding (via directional antenna) shall be assessed, including interference hunting in cellular networks. Failure in any test within a specified range shall result in zero marks for that range.	v. 9KHz – 20 MHz AM broadcast and any other service in this range vi. 20 MHz – 400 MHz c. FM/AM BC, d. VHF/UHF Comm with bearing vii. 700 MHz- 6 GHz Cellular services 2G, 3G, 4G, including interference Hunting viii. 6 GHz- 8GHz Detection and homing of Point to Point Links		
c.	Field Strength Measurement	a. dB μ V/m b. dB μ V c. dBm	All the unit must be displayed in the system		
d.	Occupied Bandwidth	a. $\beta\%$ method b. x-dB method	All the methods must be displayed in the system		
e.	Demodulation	c. USB d. LSB e. AM f. FM g. PM h. CW i. Pulse j. I/Q	All the demodulation method be displayed in the system		
f.	Level Detectors	Average, RMS, Positive Peak, Negative Peak	All the values must be displayed in the system		

S#	Domain	Description	Criteria	Test Result	Remarks
g.	Attenuation	User selectable from 0-30 dB or above (manual and automatic)	Will be test on the system		
h.	Monitoring Antenna	Supporting Omni and Directional antennas to cover 20 MHz to 8 GHz or above frequency range	Both the antennas i.e. omni as well as directional antenna will be tested on the given range.		
i.	Batteries	Minimum 4 hour battery backup per pack	Battery backup shall be evaluated by operating the system under real task conditions from full charge until complete discharge during test and trial.		
		Spare Battery Pack			
j.	Self Test	Built-in self-test option for troubleshooting and maintenance			
k.	Spectrum Analysis Display	a. Frequency Spectrum b. Waterfall, c. Persistence d. Maxhold e. Minhold f. Average g. Clear/Write h. Squelch			
l.	Scan Modes	User selectable a. Panorama Scan b. Frequency Scan c. Memory Scan			
m.	GIS and digital maps	The software shall have GIS support for displaying monitoring results through google or open street maps Bearings shall be automatically transferred and displayed on the GIS interface without manual intervention. The system shall support triangulation and logging/playback with bearing visualization. Manual or user-triggered bearing capture shall not be considered compliant.			
n.	Report Generation	Report shall be in the form of a. screenshots image (JPEG/PNG) b. graph, c. spectrum trace d. maps e. audio recording f. bar chart g. Table h. CSV i. Excel j. word/pdf.			

8. CONFIRMATION OF TEST AND TRIALS

This is to certify that the mandatory test and trials of the proposed RF Sensors / Monitoring System under Lot (II) were conducted in accordance with the approved Test and Trial Procedure and the relevant provisions of the RFP. The tests and trials were witnessed and evaluated by the authorized representatives of the Procuring Agency (FAB) and the Bidding Agency.

The compliance status has been recorded based on actual observations during the field and laboratory tests. This document serves as formal confirmation of the conduct of test and trials.

FAB Team:

S/No	Name	Designation	Signature

Bidder Team

S/No	Name	Designation	Signature

* * * * *