प्रसार भारती/Prasar Bharati
(भारत का लोक सेवा प्रसारक)
(India's Public Service Broadcaster)
आकाशवाणी महानिदेशालय /Directorate General: All India Radio
योजना एवं विकास एकक, आकाशवाणी भवन, संसद मार्ग, नई दिल्ली-110001
P & D Unit, Akashvani Bhawan, Sansad Marg, New Delhi-110001
[एफ. एम. डिजाईन अनुभाग /FM Design Section]
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File No. 5KWMobile/9/4/2022-DDG(TD-TM) Dated 16.03.2023

Subject: Specifications for Supply of 5kW FM Transmitters, Audio Processors, Modulation Monitor, RF Coaxial Cable & 2-Bay VHF FM Antenna-**regarding Industry feedback & budgetary quotes**

Dear Sir,

DG: AIR is planning for procurement of above referred equipment/items, on open tender basis. Draft technical specifications are enclosed for reference.

In this regard, the Prospective bidders from India are requested to give their industry feedback (if any) on the above referred draft Specifications **up to 31.03.2023.** To get an estimated cost, the Prospective bidders from India are also requested to give their budgetary quote for the above referred subject **up to 31.03.2023.**

Industry feedback (if any) and budgetary quote may be sent to this Directorate at the following e-mail addresses.

murugan_k@prasarbharati.gov.in
manzoor@prasarbharati.gov.in
vijendrapanwar@prasarbharati.gov.in
ravishankermeena@prasarbharati.gov.in

Encl: As above.

(मंजूर अली/Manzoor Ali)
उप निदेशक (अभि.)/Dy. Director (Engg.)
कृते महानिदेशक /For
Director General

To: (through email)
1. Prasar Bharati web-site
2. The Prospective Bidders
3. DDG (E-Purchase), P&D Unit, DG: AIR, New Delhi

कृते महानिदेशक /For Director General

816607/2023/FM Design - P&D Unit

AIR Specification No: 5kW FM TX/12/February/2023-D (TD/FM)

Prasar Bharati
(India's Public Service Broadcaster)
Directorate General: All India Radio
P & D Unit, Akashvani Bhawan,
Sansad Marg, New Delhi-110001
[FM Design Section]

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Specifications for Supply of 5kW Digital Compatible (HD Radio & DRM+) VHF FM Solid-state MOSFET technology based broadcast transmitter in (1+1) configuration with automatic changeover unit and associated equipments/items -*5 Nos.*

SUMMARY

A. ESSENTIAL REQUIREMENTS FOR TENDER:

1. (i) The tenderer should submit Schedule of Requirements/Materials of Supply (un-priced) ***in the same format as given in Section-V (A&B)*** of AIR Specifications in the technical bid, failing which the tender shall be considered incomplete and is liable to be rejected.

   (ii) It is also mandatory to mention ***Make & Model of the offered equipment*** in the Schedule of Requirements/Materials of Supply, failing which the tender shall be considered incomplete and is liable to be rejected.

   (iii) Make/Model and detailed specifications of the equipments/items being offered shall be mentioned categorically, to access the full merit of the offer, failing which tender shall be considered incomplete and is liable to be rejected. Broader terms **viz. Equivalent/similar** will not be accepted.

2. Each statement of this specification has to be complied with & supported by printed technical literature, technical data sheets, schematic drawings and technical manuals from the OEM (Original Equipment Manufacturer) by the tenderer, to assess the merit of the offer without which the tender will be considered incomplete and is liable to be rejected.
3. The tenderer should submit the tender offer to AIR (All India Radio) in the format given below, section wise & clause wise, in respect of all the sections of technical specifications. The OEM/tenderer must provide the page number reference, in column (4) of the table given below, of the Technical bid clearly indicating the volume number also, if any, for each supporting document to verify the parametric values shown in the technical specifications compliance statement, to assess the full merit of the offer, failing which tender shall be considered incomplete and is liable to be rejected.

S. No. of AIR Specifications (Section wise & Clause wise) (1)	Details of AIR Specifications (Part/ Section wise & Clause wise) (2)	Compliance **(Yes/No)** (3)	The page No. of the tender offer, where the information/ supporting document is available. (4)	Remarks (5)
A. Essential requirements for tender				
B. Essential eligibility criteria for tenderers				
Section-I Clause wise				
Section-II Clause wise				
Section-III Clause wise				
Section-IV Clause wise				

4. The tenderer should quote the rate/cost of individual items in the tender offer while submitting the tender offer for spares **(OPTIONAL)** in commercial bid. ***Optional items will not be considered for ranking purpose.***

5. The complete technical specifications (Section wise & Clause wise) compliance statements along with Schedule of Requirements/Materials (un-priced) must be signed & stamped by the respective Original Equipment Manufacturer (OEM) in the tender document, failing which the tender shall be considered incomplete and is liable to be rejected.
   In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp the complete Technical specifications (Section wise & Clause wise) compliance statements, failing which the tender shall be considered incomplete and is liable to be rejected. The OEM & tenderer should mention their name & designation of the signatories with full address, phone number, e-mail addresses etc.

6. The authorization and guarantee must be given by respective Original Equipment Manufacturer (OEM) on their letter head pad duly signed & stamped. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also give guarantee on their letter head pad duly signed & stamped, failing which the tender shall be considered incomplete and is liable to be rejected. Guarantee shall be as per the

format given in AIR specification. Guarantee for the commercially available off-the-shelf (**COTS**) products shall also be given by tenderer/OEM of the system.

7. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer should also furnish a certificate from the OEM that the tenderer can quote items of the OEM directly, failing which the tender shall be considered incomplete and is liable to be rejected without any notice/back reference.

8. Any change in the AIR technical specifications format or language or in parameters or of any other nature including the deletion/addition of technical specifications clause, words, lines in the technical specifications compliance statement by the OEM/ tenderer will not be acceptable to AIR and the tender is liable to be rejected.

9. Prasar Bharati will follow the reciprocal market access strategy of the Government of India, which describes on the Clause 10(d) of Public Procurement Preference to Make in India, Order 2017. The Purchaser shall have right for not to consider any Bid and may restrict such Bidders from the bidding process; who originate from those countries, where they do not allow market access for Indian companies; in such cases, the Clause 10 (d) of Public Procurement Preference to Make in India, order 2017, shall be invoked wherever applicable, when it is relevant.

10. Amendment in General Financial Rules (GFRs), 2017-Golobal Tender Enquiry issued vide F. No. 12/17/2019-PPD dated 15.05.2020 of Government of India, Ministry of Finance, Department of Expenditure, Public Procurement Division shall be applicable.

B. ESSENTIAL ELIGIBILITY CRITERIA FOR TENDERERS:

(a) The tenderer shall be from India only.

(b) The tenderer should either be the OEM of VHF FM transmitters/TV transmitters/AM Transmitters or their authorized representative/dealer in India.

(c) In case the tenderer is the authorized representative/dealer, the tenderer must be an authorized representative/dealer of any OEM of VHF FM transmitters/TV transmitters/AM Transmitters of power not less than 5kW for last **three years or more OR** must be in the business of sales and supply of VHF FM transmitters/TV transmitters/AM Transmitters of power not less than 5kW for last **three years or more**. Documentary evidence to support this must be provided.

(d) (i) The OEM of the transmitter must have an experience of manufacturing and supplying VHF FM transmitters of power output not less than 5kW for at least last 10 years. Documentary evidence to support this must be provided.

(ii) The OEM should have supplied VHF FM transmitters to reputed/public broadcasters. The OEM must provide the details of past supply record (**in the format given below)** for at least 20 Nos. of such VHF FM transmitters of power output not less than 5kW, supplied during last 7 years ending last day of the month previous to the one in which the tender is invited. Documentary evidence to support this must be provided.

Supply order No. with date	Transmitter Model	Transmitter Power Output	Qty. supplied	Name of the broadcaster with full postal address including e-mail address to whom transmitter was supplied.	Remarks
(1)	(2)	(3)	(4)	(5)	(6)

(iii) All India Radio reserves the right to get performance feedback of the transmitters from any of the above broadcasters named by the tenderer/OEM.

(iv) Copies of supply order/Completion certificates/delivery challans/invoice of at least 10 Nos., out of the 20 Nos. of VHF FM transmitters submitted by the tenderer in above format, are also to be enclosed by the tenderer.

(e) The OEM of the offered VHF FM transmitter must have his local office/authorized representative/dealer in India for after sales support. **A certificate as per Annexure-III** duly signed by the OEM as well as local office/authorized representative/dealer must be submitted with the offer. Copy of Agreement/MoU executed between OEMs and their authorized representative/dealer duly signed by both must also be submitted with the offer.

SECTION-I GENERAL

THE BROAD SCOPE OF THE SPECIFICATIONS IS AS FOLLOWS:

1.0 General Scope:

The specifications is for Supply of 5kW Digital Compatible (HD RADIO & DRM+) VHF FM Solid-state MOSFET technology based broadcast transmitter in (1+1) configuration with automatic changeover unit and associated equipments/items for use anywhere in India as transmitter set up.

The 5kW Digital Compatible VHF FM Solid-state MOSFET technology based broadcast transmitter in (1+1) configuration with automatic changeover control unit and all associated equipments/items as per Section-V(A & B) shall be capable of continuous round the clock operation.

Transmitter and associated equipments/items shall be field proven for satisfactory operation.

The following are excluded from the scope & will be provided by AIR:

i. Construction of necessary buildings, all masonry works & materials connected therewith, masonry foundations, cable trenches & under floor ducts etc. (Dimensions for which are to be furnished by the transmitter supplier, if any).
ii. Power supply connection for the transmitting equipment at a single point.
iii. Furniture & fittings not forming a part of the transmitter equipment.

1.1 Broad Scope of Supplies:

Major Equipments/items to be included:

S. No.	Description of Equipments/items
1.	5kW Digital Compatible (HD Radio & DRM+) VHF FM Solid-state MOSFET technology based broadcast transmitter in (1+1) configuration with automatic changeover unit
2.	Dummy Load
3.	Motorized RF Coaxial Changeover Switch
4.	RF Coaxial Copper Rigid Lines
5.	Thru line power meter (s)

1.2 Instructions to bidders: Tender documents shall be referred for general term and conditions of contract for supply including all the commercial aspects like Packing and Packing List, Insurance and Marine Risk etc., Payment terms, Penalty/Compensation for Delay, Damages and Liabilities, Time Period and Extension for Delay , Foreclosure of Contract due to Abandonment or Reduction in Scope of Supply, Cancellation of Contract in Full or Part, Recovery of Security Deposit, Performance Guarantee, Unsatisfactory Workmanship, Damages Incurred During Transit, Tenderer Liable for Damages, Defects, Recovery of Compensation, Ensuring Payment and Amenities, Tenderer to Indemnify Government against Patent Rights, Release of Security Deposit, Safety Code, insurance from manufacturer's works/factory to respective site etc. **i.e. in totality**.

1.3 LANGUAGE / UNITS:

All information supplied by the tenderer and all markings, notes, designation on the drawings and associated write-ups including Instruction Manuals shall be in **"English language" only**. All dimensions and units on drawings and all references to weights, measures and quantities shall be in **SI units**.

1.4 DOCUMENTS/INFORMATION TO BE SUPPLIED WITH THE TENDER OFFER:

1.4.1 The complete technical specifications (Section wise & Clause wise) compliance statements alongwith Schedule of Requirements/Materials (un-priced) duly signed & stamped by the respective Original Equipment Manufacturer (OEM) and countersigned by the tenderer as per the format given above in clause A (3), **to assess the full merit of the offer, without which the tender offer will be considered incomplete and is liable for rejection.**

1.4.2. Complete printed technical literature/technical data sheet/schematic drawings/detailed information including Technical Manual (for Installation, Testing, Commissioning, Operation, Maintenance & Servicing, including theory of operation, circuit description and fault diagnosis) of 5kW Digital Compatible VHF FM solid-state MOSFET technology based broadcast transmitter in (1+1) configuration and associated equipments/items as per Section-V(A&B) from the respective Original Equipment Manufacturer (OEM) in support of compliance statement should be furnished, **to assess the full merit of the offer, without which the tender offer will be considered incomplete and liable to be rejected.**

1.4.3. Detailed Schedule of Requirements/Materials (un-priced) for the supply of 5kW Digital Compatible VHF FM solid-state MOSFET technology based broadcast transmitter in (1+1) configuration and associated equipments/items for each site should be in conformity with Section-V(A&B) without any change in the format, **failing which the tender will be considered incomplete and is liable for rejection. The tenderer must quote all items.**

1.4.4. Descriptive information and complete details of each equipment offered shall be given by the tenderer.

1.4.5. Country of Origin, Make, Type & Model of all the offered items should be mentioned including the name & address of their vendors.

1.4.6. The performance figures of the offered equipment/items must be given by the tenderer**, to assess the merit of the offer, without which the tender will be considered incomplete and liable to be rejected.**

1.4.7 A copy of Technical Manuals {for Installation, Testing, Commissioning, Operation, Maintenance & Servicing, including theory of operation, circuit description with detailed circuit drawings and fault diagnosis}, must be enclosed with technical bid for assessing the transmitter system. The Technical Manual must include at least the details given below: **Tenderer has to provide technical manual without insisting AIR to sign any non-disclosure certificates/agreements.**

(a) The Installation Manual must describe the following information:

(i) A detailed write up in English only regarding VHF FM transmitter system along with its associated equipments/items.

(ii) Diagrams showing the isometric view of VHF FM transmitter and associated equipment with dimensions in metres/mm.

(iii) The procedure of alignment and adjustment of various assemblies & sub-assemblies of VHF FM transmitter such as Exciter, PA, Control Circuit, output stage etc.

(iv) **All *Do's and Don'ts* which are essential for safe installation of the transmitter system.**

(v) An inter-wiring diagram for all transmitter units/modules installed in the transmitter rack, input/output to transmitter and interlocks with external units and accessories like dummy load, changeover switches, patch panel etc. which are wired in the transmitter interlocks.

(b) Operation, Maintenance & Servicing Manual must describe the following:

(i) General description of the offered VHF FM transmitter, transmitter block diagram/schematic drawings indicating the details of different blocks, modules and redundancy incorporated in transmitter and its subsystems.

(ii) Details regarding Digital Compatible of the offered VHF FM transmitter for HD Radio and DRM+ mode for future up-gradation with block diagram/schematic drawings.

(iii) General description and structural overview of the transmitter racks indicating the position of different modules, units, power distribution etc.

(iv) Colour Photographs of transmitter showing the following:

(a) Front, Rear and Top view of the transmitter.

(b) Front and rear view of PA, Exciter & Control Unit.

(c) View of PA with cover opened showing full view of Pallets/RF Boards, various adjusting pots and field replaceable parts.

(d) Enlarged open view of PA showing at least two RF transistors and bias adjustment pots etc.

(e) Open view of Exciter Unit.

(v) Screen shots of various display screens showing monitorable and measurable parameters of transmitter.

(vi) A detailed description of working of circuits with all relevant circuit diagrams (components, parts of circuit diagrams will be co-related with circuit description provided) of the complete transmitter system should be provided with details of test points.

(vii) The details of all electrical circuits in various stages of the transmitter used along with their detailed write-ups.

(viii) General description of **RF signal flow diagram for complete RF chain from exciter to filter output with information about power level at input & output of each stage. Losses and gains in various stages including power dividers, combiners, etc. must also be shown.**

(ix) Description of transmitter interlocks, protections under abnormal conditions and schematic drawing indicating interconnections to different transmitter units, external units and accessories like dummy load, changeover switches, patch panel etc. which are wired in the transmitter interlocks.

(x) Details and schematic drawings of cooling system with description.

(xi) Details and schematic drawings of remote monitoring and control facilities of the transmitter along with screen shots of the interface displays. The transmitter parameters that can be remotely monitored and controlled.

(xii) General description of transmitter control system, schematic drawing(s) for control signal distribution including pin details of relevant connectors.

(xiii) General description of exciter unit, block schematics showing details of all sub units, Exciter front and rear views indicating all inputs, outputs and interfaces.

(xiv) General description and architecture of Power Amplifier's block schematic drawings, Front and rear views indicating all inputs, outputs and interfaces.

(xv) Description of measurement of DC voltages, currents and RF power of PA.

(xvi) Description of protection mechanism against high VSWR, overload, high temperature of the exciter, Power Amplifiers and transmitter system.

(xvii) Description of VSWR/temperature foldback alongwith range of foldback. The explanation of foldback with the help of circuit diagram.

(xviii) Details of splitter and combiner system's schematic drawings used in the transmitter.

(xix) Description of various interfaces, connectors, connecting cables and accessories used in the VHF

FM transmitter.

(xx) A complete list of all parts/transistors/ICs/components (alongwith part numbers of OEM of the components) used in the transmitter.

(xxi) The make and number of LDMOS/MOS devices used in the power amplifier must be mentioned clearly.

(xxii) Technical data sheet of all high power RF devices/RF components used in the transmitter.

(xxiii) Procedure for changing the frequency of operation of the transmitter.

(xxiv) The detailed procedure and possibilities of by-passing control circuit with diagrams.

(xxv) The description of manual operation of control system including cooling system.

(xxvi) All the screen shots of display of control unit in sequential manner for operation, monitoring and control of each unit viz., Exciter, PAs, cooling systems, power supply, various settings in software etc.

(xxvii) **All *Do's and Don'ts* which are essential for safe Operation & Maintenance of the transmitter.**

(xxviii) Various test fixtures and accessories required for the maintenance/repair of the VHF FM transmitter.

(xxix) The detailed procedure for troubleshooting of the VHF FM transmitter preferably up to component level.

(xxx) The systematic troubleshooting /fault tree and flow diagram should be provided for diagnosis of the faults with their remedial measures.

(xxxi) General description of electrical power distribution and schematic drawing of power supply system used for the transmitter system.

1.4.8 List of equipment for which respective OEMs' compliance statements, guarantee certificates and certificates for authorization for after sales support is required:

(i) Transmitter including automatic changeover unit
(ii) Dummy Load
(iii) Thru line power meter (s)
(iv) RF coaxial copper rigid lines & accessories
(v) Motorized RF coaxial changeover switch

All the above documents are necessarily to be provided on respective OEMs' letterhead, duly signed by authorized signatory of the OEM with name and designation of authorized signatory. The documents must have clear reference of item being offered by the respective OEMs.

1.4.9 In addition to above, the tenderer is also required to submit the document (s)/information as asked elsewhere in the technical specifications, to assess the full merit of the offer, without which the tender offer will be considered incomplete and liable to be rejected.

1.5 DOCUMENTS/INFORMATION TO BE SUPPLIED BY THE TENDERER WITHIN 15 DAYS AFTER ISSUE OF ACCEPTANCE OF TENDER:

One set of **Technical Manuals** {containing all the details as in 1.4.7(a) & (b) for Installation, Testing, Commissioning, Operation, Maintenance & Servicing, including theory of operation, circuit description with detailed circuit drawings and fault diagnosis}, **COLOUR** printed and duly bound, for 5kW Digital Compatible VHF FM transmitter in (1+1) configuration, Automatic Changeover Unit (ACU), Dummy Load, Thru Line power meter, Motorized RF coaxial changeover switch, RF coaxial copper rigid line, Remote Monitoring & Control facility etc. along with one soft copy on pen drive must be supplied to "The DDG (E-FM), P & D Unit, DG: AIR, New Delhi-110001", **for examination and approval**.

1.6 INFORMATION TO PRECEDE DISPATCH OF EQUIPMENT:

Following information should be supplied to The DDG (E-FM), P & D Unit, DG: AIR and each of the consignees prior to dispatch of equipment:

a) Detailed list of equipments under dispatch.
b) Photograph showing location of various units/subunits with item numbers marked thereon.

1.7 DOCUMENTS/INFORMATION TO BE SUPPLIED ALONG WITH EQUIPMENT:

Technical Manuals (duly approved by AIR) {containing all the details as in 1.4.7(a) & (b) for Installation, Testing, Commissioning, Operation, Maintenance & Servicing, including theory of operation, circuit description with detailed circuit drawings and fault diagnosis}, **COLOUR** printed and duly bound, for 5kW Digital Compatible VHF FM transmitter in (1+1) configuration, Automatic Changeover Unit (ACU), Dummy Load, Thru Line power meter, Motorized RF coaxial changeover switch, RF coaxial copper rigid line, Remote Monitoring & Control facility etc. and inspection report shall be supplied as per the details given below:

(i) For Consignee- 2 Sets of technical manual in hard copies printed and duly bound alongwith one soft copy on pen drive.
(ii) For the following Offices/Officers-One soft copy on pen drive for each offices/officers:
DDG(E-FM), DDG(E-TM), Zonal Office (Maintenance Wing of North zone), Zonal Office (Project Wing of North zone), Technical Library(P&D Unit), R&D & NABM (T)

1.8 DELIVERY PERIOD:

Supply at respective site shall have to be completed within **SEVEN MONTHS** from the date of issue of Acceptance of Tender or **THREE MONTHS** from the date of the Decision Letter issued to the firm by AIR, whichever is later.

1.9 PACKING AND PACKING LISTS

All the equipment should be securely and properly packed to withstand transit hazards. Equipment packing shall be fit for sea freight and incorporate adequate protection against ingress of moisture. Packing slips giving details of the items contained in each package shall be placed inside the package in a water proof envelop to enable easy identification and should contain cross references to item/part numbers of installation drawings/components lists. The copies of packing slips and other details should be sent separately to respective consignee and also to DDG (E-FM), P & D Unit, DG: AIR, New Delhi.

1.10 INSURANCE AND MARINE RISKS ETC.

Please refer to commercial terms.

1.11 GUARANTEE:

The tenderer shall submit with his offer an undertaking to accept the following guarantees:
{This Guarantee clause is applicable to Transmitter as well as all the associated equipments/items mentioned in Schedule of Requirements/Materials (un-priced)}.

(i) A guarantee that the equipment supplied will be in accordance with these specifications, varied only to the extent stated in his tender and agreed to in the contract.
(ii) A guarantee to make good within **15 days** (from the date of first intimation to OEM/tenderer) at tenderer's expense any component which becomes defective under normal operating conditions for **36 months** from the date of supply at D-6 Godown Delhi. If the tenderer failed to rectify the fault within

the stipulated period of 15 days, the guarantee period for that particular location (site) would be extended corresponding to the outage period.

(iii) A guarantee to supply all components for a period of **10 years** from the date of supply, at rates at which these are being supplied by the firm to other customers and also should match prices of original manufactures of these components prevailing at that time.

(iv) If at any stage during next **10 years**, the manufacturer stops production of this model of transmitter, the firm shall intimate All India Radio in advance to enable the latter to stock the critical items.

1.12 PRE-DISPATCH INSPECTION OF TRANAMITTER & ASSOCIATED EQUIPMNTS/ITEMS:

The complete Acceptance Test Procedure/Protocol (ATP) will be prepared by the respective OEM of the offered equipments/items and submitted to DDG (E-FM), P&D Unit, DG: AIR for approval within **15 days** of issue of Acceptance of Tender. ATP will also indicate full details of setup for measuring/testing equipments to be deployed during the performance measurements/inspection. The approved ATP shall form the basis for performance measurements/inspection to be carried out. AIR has the right to include other technical parameters in ATP submitted by OEM within the ambit of specification of the product offered.

(A). INSPECTION OF TRANSMITTERS:

a). Detailed Pre-dispatch Inspection (PDI) of transmitters on dummy load will be carried out at OEM's Works Place by **two Engineers** of All India Radio as per details given in **Annexure-I.**

b). Call for Pre-dispatch Inspection (PDI) is to be given by the tenderer to All India Radio at least **6 weeks** in advance from the date of PDI. Testing/measurement reports as per approved in ATP along with approved copy of Technical Manual (s) must be submitted to All India Radio along with the call for inspection of transmitters for analyzing etc. These testing/measurement reports and approved copy of Technical Manual (s) must also be available at the time of inspection of the transmitters.

c). Inspection period will be two days for each Set (1+1) transmitter and two additional day to test the compatibility of the transmitter for HD Radio or DRM+ mode and endurance test.

d). For AIR inspecting engineers, expenses toward to and fro air journey, boarding, lodging etc. will be borne by All India Radio.

(B). INSPECTION OF ASSOCIATED EQUIPMENT/ITEMS:

a). All other associated equipments/items like Dummy Load, Thru line power meter, RF coaxial copper rigid lines & accessories, Motorized RF coaxial changeover switch etc. will be accepted on the basis of Original Equipment Manufacture's (OEM) Test Certificates, duly signed and stamped by OEM. The approved ATP shall form the basis for performance measurements/OEM test certificates.

b). These OEM test certificates duly stamped and signed by OEM in respect of all equipments/items as per approved ATP are to be submitted by the tenderer to AIR along with the call for inspection of transmitters for analyzing etc. These OEM test certificates must also be available at the time of inspection of the transmitters.

1.13 TRAINING:

a. OEM's Engineer(s) shall train about **20 AIR Engineers** for **5 working days** at any one of AIR sites / Delhi within six months after supply, to enable them to become acquainted with all particulars as well as installation, operation, maintenance, trouble shooting of the transmitter and associated equipments at no cost to AIR. However, AIR shall bear all touring expenses of AIR Engineers deputed for training and the same is not to be included by the tenderer in their offer.

b. The training shall cover theoretical concepts, demonstration of salient features, configuration of transmitter, operational, maintenance & servicing, fault finding, circuit tracing, component/ module replacements, trouble shooting, preventive maintenance, remote control operation and other relevant topics etc. related to the transmitter.

c. Training material in hard and soft copies are to be provided by the OEM to each AIR engineer undergoing the above training.

d. **Colour printed & duly bound** two sets of training lecturer notes, schematic drawings, hand books etc. shall be supplied to DDG (E-FM), P&D Unit, DG: AIR before commencement of training.

1.14 ESSENTIAL REQUIREMENT FOR LOCAL OFFICE/AUTHORIZED REPRESENTATIVE/ DEALER IN INDIA FOR AFTER SALES SUPPORT:

(a) The OEM should have complete setup for maintenance/repair of the transmitter in India, either of its own or through local office/authorized representative/dealer.

(b) The local office/authorized representative/dealer will be the nodal point for resolving issues related to after sales support. It is the responsibility of local office/authorized representative/dealer to arrange the repair/replacement of faulty items. Any module of transmitter or other equipment requiring repairs will be repaired. If it is not feasible to repair the module at site, the same will be collected from the site by local office/authorized representative/dealer and will arrange repairs locally. The cost of transportation, repairs etc. shall be borne by the tenderer during the guarantee period.

(c) After sales support for the repairs/maintenance of transmitter system after the completion of guarantee period, shall also be provided by the respective OEM of the transmitter and other associated equipments through their local offices/authorized representatives/dealers in India.

(d) The details of technical facilities available with local office/authorized representative/dealer **for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid**.

(e) At the discretion of AIR, the representative(s) of AIR may visit the works of local office/authorized representative/dealer of OEM in India to ensure/verify that adequate technical infrastructure is available for after sales service for timely resolving the issues related to attending/replacing the equipments. Tenders from the tenderers who failed to meet these criteria shall be considered incomplete and is liable to be rejected.

1.15 SPARES (Optional):

(a) The minimum recommended essential spares as per Section-V(B) and any other critical spares suggested by the OEM, required to maintain the continued service of the transmitter in a reliable manner, shall be quoted by the tenderer.

(b) The minimum recommended essential spares may be based on predicted rate of failure.

(c) In case, the tenderer quotes the optional items as 'a set', the details of the components/items offered in the 'set' must be spelt out clearly including their Make & Model and quantity, failing which the tender offer is liable to be rejected.

(d) All India Radio at its own discretion may procure essential spares for a value not exceeding 10% of the cost of equipments. The tenderer should quote all the essential spares.

1.16 ENVIRONMENTAL CONDITIONS FOR TRANSMITTER AND ALL ASSOCIATED EQUIPMENT:

Outside temperature range	:	-30º C to + 40º C
Ambient temperature range for operation	:	0º C to + 40º C
Relative humidity	:	95 percent, non-condensing
Working altitude	:	Up to 4500 meters AMSL

The OEM of the transmitter is required to submit supporting technical documentary proof along-with tender documents in order to confirm/verify that the offered transmitter shall work at the rated power of the transmitter without any de-gradation in the performance of the offered transmitters under above mentioned environmental conditions.

1.17 POWER SUPPLY FOR THREE PHASE EQUIPMENT:

Operating Line Voltage	:	AC Three phase, 4 wire, 400V ± 10 %
Frequency	:	50Hz ± 4 %
Power Factor	:	Better than 0.9

1.18 POWER SUPPLY FOR SINGLE PHASE EQUIPMENTS:

Operating Line Voltage	:	AC Single phase, 230V ± 10 %,
Frequency	:	50Hz ± 4 %
Power Factor	:	Better than 0.9

SECTION-II

2.0 TRANSMITTER CONFIGURATION:

5kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter in (1+1) configuration with automatic changeover control unit shall be supplied to each site with the following configurations: -

a) Each 5kW Digital Compatible FM Transmitter shall be supplied with two Exciter units to maintain redundancy in each transmitter i.e. one set of 5kW Digital Compatible FM Transmitter in (1+1) configuration shall have total four Exciter Units. The second Exciter unit will work as hot or active standby in automatic changeover mode (with manual override) which will also incorporate auto audio (Analog L/R, AES/EBU, RDS/DARC, SCA) changeover. The automatic changeover of Exciter should take place in case of failure of active Exciter.

b) 5kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter shall be configured to operate in (1+1) mode. The second 5kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter will work as hot or active standby in automatic change over mode (with manual override). The operation in (1+1) configuration is done by an Automatic Changeover Unit (ACU). The automatic changeover of Transmitter should take place when power of active Transmitter goes down by $\geq$ 3dB.

c) The audio shall be fed to both the Transmitter Units from single external audio source and therefore, proper arrangement of feeding the audio (Analog L/R, AES/EBU, RDS/DARC, SCA) to both the Transmitters through audio distribution unit shall be made.

d) 5kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter in (1+1) configuration should have provision for automatic switching of either 5kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter to the Antenna & Dummy load. The automatic changeover of transmitter should take place when power of active transmitter goes down by $\geq$ 3dB.

e) 5kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter shall be frequency agile and capable of giving $\geq$5kW power continuously with minimum of 10% headroom.

f) The 5kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter should be compatible for HD Radio and DRM+ mode for future upgradation. However, **HD Radio/DRM+ Equipments shall not be the part of supply in respect of this tender.**

g) The 5kW Digital Compatible VHF FM Solid-State MOSFET technology based Broadcast transmitter should have the facility on the front panel of the transmitter for selection of either FM Mode **OR** Digital Mode **OR** (FM + Digital Mode) so that external HD Radio **OR** DRM+ Modulator is selected in place of FM Exciter.

h) The Power Amplifiers of the 5kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter should be able to switch into class AB linear mode for OFDM use without any requirement of modifications in the supplied transmitter equipment.

i) The transmitter should be complete in all respects. All India Radio will provide three phase, 4 wire power supply at a single point as per Section-I. All other transmitter's inbuilt subsystem shall derive supply through this source. No other voltage will be acceptable to AIR at the transmitter's input circuit breaker and

failing which the offer is liable to be rejected. The performance of transmitter as per parameters in Section-III should be ensured without degradation with the given power supply tolerances.

j) The transmitter should be capable for unmanned 24×7 operations.

k) Both transmitter equipment of (1+1) configuration shall be housed in separate rack having pleasing appearance. All metal works shall be protected against rust and corrosion. All materials used in transmitter shall be non-inflammable and fire retardant.

l) Equipment at all stages i.e. Exciter unit, IPA (as the case may be), PAs, combiner, harmonic filters etc. should be frequency agile and capable of operation in the entire VHF Band i.e. 88 MHz to 108 MHz **without** change of any component.

m) The transmitter shall be suitable for Mono and Stereo FM Radio Broadcast.

n) Transmitter should be of modular design for easy maintenance & part replacement. It should be possible to take out PA module without "switching off" the transmitter.

o) The transmitter construction shall ensure complete shielding of high power RF circuits to minimize radiation. The FM transmitter will have to work in a common transmitter hall having other high power Medium Wave transmitters, Short Wave transmitters, TV transmitters in VHF & UHF band as well as other FM transmitters. Therefore, the transmitter should be adequately protected from resultant E.M.C. (Electro Magnetic Compatibility) as per ETS-300447.

p) It should comply with IEC 60215 safety standards so as to eliminate hazards to personnel. Access to parts carrying dangerous voltages shall be through interlocked doors.

q) The transmitter will consist of solid state devices such as MOSFETS in IPA (if applicable)/PA stages. It must have auto ramp up circuit for power rise when transmitter is "Switched-On".
It should be possible to vary the transmitter power from a low value (minimum 1 kW) to full value from front control panel. Details to be provided by tenderer.

r) The Power Amplifiers and Exciter Unit of one transmitter should be interchangeable with second transmitter and vise-versa.

s) **The life of transmitter should be at least ten years and it must be certified by the OEM.**

2.1 Exciter:

2.1.1 The Exciter should have Direct Digital Synthesis. It should accept Analog Mono, Analog Stereo (left and right) / Encoded Stereo signals (MPX), RDS/DARC, SCA and AES/EBU inputs. It should be compatible for Mono and Stereo Broadcasting using pilot tone system.

2.1.2 It should have its own manually adjustable power control. The pre-emphasis should be selectable/switchable.

2.1.3 It should display various parameters like forward Power, reflected power, frequency deviation and input audio level on its front Panel. Status and faults should also be indicated.

2.1.4 It should be synthesized with easy channel selection of minimum 10 kHz spacing i.e. can be operated on any of the frequency in VHF Band i.e. 88 MHz to 108 MHz. The Exciter should be **"Frequency agile"** i.e. not requiring any tuning over its entire specified operating frequency range.

2.2 Intermediate Power Amplifier Modules (If Intermediate Power Amplifiers are provided as per design of manufacturer): Total transmitter output power will be developed by an optimum combination of low power IPA modules and should be frequency agile and capable of operation in the entire VHF Band i.e. 88 MHz to 108 MHz **without tuning**.

The rated power output of the IPA unit and its maximum power output should be indicated. IPAs must be protected against "short" & "open" loads, "over-current", "high VSWR", "over-temperature", "over-drive" and "air flow" failure. The efficiency figures for each IPA are to be mentioned.

2.3 (a). **Power Amplifier Modules**: Total transmitter output power will be developed by **two or more number of hot pluggable Power Amplifiers (PAs)** and should be capable of operation in the entire VHF Band i.e. 88 MHz to 108 MHz without tuning.

Each of the Power Amplifier (PA) should be inter changeable in any position. The rated power output of the PA unit and its maximum power output may be indicated. PAs must be protected against "short" & "open" loads, "over-current", "high VSWR", "over-temperature", "over-drive" etc. The efficiency figures for each PA are to be mentioned.

(b)However, in case of two numbers of PA system, if one of the two PAs fails, suitable arrangement should be provided so that the transmitter is capable of delivering at least 40% of rated output power (TPO) to Antenna Port of RF coaxial switch. Details along with schematic diagrams should be enclosed in the tender offer.

2.4 Combiner Unit: The final power combiner required to provide desired output power level by combining the power of various output power amplifier modules/stages shall be of such type so as to be capable to operate in entire VHF Band i.e. 88 MHz to 108 MHz without any tuning & change of components/settings.

The tenderer shall offer 5kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter in (1+1) configuration in separate cabinet/rack i.e. separate rack for each transmitter. No other combination shall be acceptable.

The tenderer shall indicate the reduction in transmitter RF output power in case of failure of individual Power Amplifier units in the following format.

S. No.	Number of PA Unit failure	Transmitter RF Power Output in kW
1.	1 No.	…… kW
2.	2 Nos.	……. kW
3.	3 Nos.	…….. kW
4.	4 Nos.	…….. kW
N	N…Nos.	……. kW

Absorbers should be designed suitably so that they do not fail due to heat dissipation, in case of failure of power amplifier(s) resulting in unbalance power dissipation in absorbers.

2.5 Final Output Harmonic Filter for transmitter**:** The Harmonic Filter should be capable of operation in the entire VHF Band i.e. 88 MHz to 108 MHz without tuning & change of components/settings. The details along with schematic diagrams should be enclosed in the tender.

2.6 Protection System: Adequate protection system should be provided to safe guard the system from damage under fault conditions. The protection system should be fast acting to safe guard the system and components. Following are the typical requirements in this regard:

2.6.1 Protection against over loads, transients, severe fluctuation/variation in power supply, any other malfunctioning etc. for transmitter as well as individual PAs etc.

2.6.2 Protection against over temperature on heat sinks.

2.6.3 Protection against air/liquid flow failure and less volume of cooling.

2.6.4 Protection against high VSWR including open and short conditions at output.

2.6.5 Immediate power fold back under severe/damaging fault conditions of VSWR and temperature. The power of transmitter should automatically come down to a suitable safe design limit, so that the transmitter and its subsystems do not get damaged due to load mismatch/ high temperature.

2.6.6 Transmitter should be protected against lightning by providing DC/RF discharge path and details of the same are to be given.

2.7 Control and Interlocking:

2.7.1 The control and interlock circuits shall ensure protection and operational safety of the equipment and personnel. They shall allow the transmitter to be "switched-in" or "out-of-service" in a proper sequence only by operation of switch buttons or manual controls on transmitter panel. Switching-in of the auxiliary units such as Dummy Load, Reject Loads, exhaust fan etc. shall be suitably interlocked. External units and accessories like Dummy Load, Change over Switches etc. should be wired in transmitter interlock.

2.7.2 Details of the control/monitoring/protection unit should be given.

2.7.3 It should be possible to switch off the entire transmitter in emergency by the operation of a single push button/manual command**.** This should be on front panel.

2.7.4 Stages of sequential operations of switching "ON" and "OFF" of the transmitter shall be indicated by use of suitably coded electronic display or through WEB GUI. In addition, all protections as indicated in clause 2.6 shall remain indicated until reset. The fault indication shall be supplemented with audible alarm.

2.8 INSTRUMENTATION & INDICATIONS :

All-important parameters required for monitoring and fault diagnosis should be displayed on either respective meters or on LCD display. Some of these are Forward & Reflected power of transmitter and individual PA units.

2.8.1 Transmitter status and fault conditions shall be indicated.

2.8.2 Transmitter shall have the facility to display Forward and reflected transmitter output power.

2.8.3 Suitable test points for operational check outside the module shall also be provided.

2.8.4 RF Outputs sample (Forward and Reverse) should be provided on connectors for performance measurement.

2.9 COOLING SYSTEM:

Full details of cooling system and subsystems shall be given. Details of cooling system and filters shall be given. Quantum of heat required to be handled by the cooling system is also to be indicated. Any special space requirement for installation of cooling system is also to be indicated.

2.10 TRANSMITTER POWER SUPPLY:

The transmitter shall be complete in all respects. The power supply requirement shall as per Section-I at a single point. All the power supply required for the transmitter and its associated equipments should be derived from the same point.

The AC and DC supply should have their protective devices. The rectifier and filter circuits should be able to take care of switching voltage surges on power lines. Adequate metering / indications like DC voltage and current to be provided. Power supply unit to be protected against "over temperature", "over-current" and "over-voltage", transients etc. The unbalance between the phases shall not exceed by 10% of the total line/phase current during normal conditions of operation. The tenderer shall provide following technical details as per table given below, failing which the offer is liable to be rejected.

Transmitter Power in kW	Phase Current (I_R) Amp.	Phase Current (I_Y) Amp.	Phase Current (I_B) Amp.	Neutral Current (I_N) Amp.
1				
2				
3				
4				
5				

2.11 AUTOMATIC CHANGEOVER CONTROL UNIT (ACU):

(i) One Automatic Changeover Unit (ACU) for operating the transmitter in (1+1) configuration to facilitate automatic switch "ON" of the 2nd transmitter Unit in case of failure of RF output of 1st transmitter Unit shall be offered by the tenderer.

(ii) Any one of the 5kW Digital Compatible FM transmitter unit shall be selectable as master or slave automatically in active standby mode. When the RF power of the 1st transmitter goes down by 3 dB or more, it should be sensed as a failure to switch to second transmitter automatically. In case of failure of the complete system, there should be provision of three trials wherein against each trial, the time shall be adjustable up to 1 minute individually before final switch OFF.

(iii) Arrangement shall be made for bypassing the ACU in case of its failure so as to enable operating personnel to operate the transmitters in the manual mode.

(iv) Power Supply to the ACU shall be fed through the UPS.

(v) The changeover time between the two transmitters should be ≤ 30 seconds.

2.12 REMOTE MONITORING AND CONTROL FACILITY:

The transmitter shall have the facility for remote monitoring and control from distant location with web browser-based GUI and third party Network Management System/SNMP over TCP/IP using broadband connection with fixed I.P, with password protection using any PC/laptop or smart phone. Application should also be compatible with browsers like Chrome, Firefox etc.

The Remote monitoring and control facilities should be capable for controlling and monitoring various parameters of FM transmitter and automatic changeover unit from a distant location **as per details given in clause 3.10.**

Software and hardware required for remote monitoring and control of transmitter shall be part of the supply of the transmitter. The broadband connection with fixed I.P shall be provided by AIR.

MIB files will be provided by tenderer, if applicable.

SECTION-III

TECHNICAL SPECIFICATIONS OF TRANSMITTER

S. No.	TECHNICAL PARAMETERS	TECHNICAL SPECIFICATIONS
3.1	**GENERAL**	
3.1.1	Frequency Range	88 MHz to 108 MHz
3.1.2	Nominal Frequency Deviation	±75 kHz (peak)
3.1.3	Maximum Frequency Deviation	±100 kHz (peak)
3.1.4	Frequency Setting	Direct from front panel in 10 kHz steps
3.1.5	Class of Emission	180KF8E
3.1.6	Stereo Transmissions	Pilot tone system
3.1.7	Pre-emphasis	0, 50 µs (selectable).
3.2	**RF OUTPUT**:	
3.2.1	Rated Output Power	≥ 5kW continuous with minimum headroom of 10%.
3.2.2	Output (Load) Impedance	50 Ω unbalanced.
3.2.3	Permissible VSWR	1.5: 1 with full power. Power fold-back beyond 1.5: 1. Details of power fold back characteristics to be provided.
3.2.4	Harmonics and Spurious Suppression	Within limits as per Radio Regulations & ITU-R Rec The actual values are to be indicated.
3.2.5	Overall Efficiency (AC to RF Out) for FM (Analog) Mode only	≥ 70 %.
3.2.6	RF Output Connector	1-5/8" with EIA flange
3.2.7	Max. Frequency Tolerance	As per ITU-R Rec.
3.2.8	Synchronous AM S/N Ratio referenced to 100% AM modulation at 400 Hz, 50 µs Pre-emphasis with FM modulation at ±75kHz deviation.	Better than 50 dB
3.2.9	Asynchronous AM S/N Ratio unweighted, referenced to 100% AM modulation at 400 Hz, 50 µs Pre-emphasis and without FM modulation.	Better than 55 dB
3.3	**INPUTS**:	
3.3.1	Modulating Input Signal	Exciter should accept Analog Mono, Analog Stereo (left and right)/Encoded Stereo Signals (MPX), AES/EBU, RDS/DARC and SCA inputs. It should be capable for Mono and Stereo Broadcast using pilot tone system.
3.3.2	(i)Input Impedance (Analog)	600Ω or greater (for Mono)
		10 kΩ or greater (for Stereo/MPX)
	(ii) Input Impedance (AES/EBU)	110 Ω Nominal
3.3.3	Analog and AES/EBU input Level for ± 75kHz (peak) Deviation:	ANALOG AUDIO INPUT: Input Level adjustable from -6 dBu to +6 dBu AES/EBU AUDIO INPUT: Input Level adjustable from -12dBFS to 0dBFS

3.4	**POWER SUPPLY**	
3.4.1	Power	Three phase, 4 wire as per Section-I
3.5	**MONO OPERATION**	
3.5.1	FM S/N Ratio at ±75kHz Deviation (30 Hz to 15 kHz), rms, unweighted (22 Hz - 22 kHz)	Better than 70dB
3.5.2	Total Harmonic Distortion plus Noise (THD+N) (30 Hz to 15 kHz)	Better than 0.1%
3.5.3	Amplitude Response (30 Hz to 15 kHz)	Better than or equal to ± 0.2 dB
3.6	**STEREO OPERATION :**	
3.6.1	Stereo Separation at ±75kHz Deviation (30 Hz to 15 kHz)	Better than 50 dB
3.6.2	Linear Cross Talk referred to 100% modulation (30 Hz to 15 kHz)	Better than 50 dB
3.6.3	FM S/N Ratio at ±75kHz Deviation (L or R) (30 Hz to 15 kHz) rms, unweighted (22 Hz - 22 kHz)	Better than 70 dB
3.6.4	Total Harmonic Distortion Plus Noise (THD + N) (L or R) (30 Hz to 15 kHz)	Better than 0.1%.
3.6.5	Amplitude Response (L or R) (30 Hz to 15 kHz)	Better than or equal to ± 0.2 dB
3.6.6	Pilot Tone Stability	As per ITU-R Rec.
3.7	**WIDEBAND COMPOSITE OPERATION**:	
3.7.1	FM S/N Ratio at ±75 kHz Deviation, rms, unweighted (22 Hz - 22 kHz)	Better than 70 dB
3.7.2	Total Harmonic Distortion Plus Noise (THD + N) (30 Hz to 15 kHz)	Better than 0.1%
3.7.3	Amplitude Response (30 Hz to 100 kHz)	Better than or equal to ± 0.2 dB
3.8	**DIGITAL (DRM+ OR HD Radio) OPERATION:**	
3.8.1	MER (Modulation Error Ratio) at 25% of nominal rated analog RF Output Power of transmitter for pure digital mode in HD RADIO/DRM+.	Should not be less than 21dB @ 4QAM/16-QAM.
3.8.2	Spectral Emission Limits for HD Radio/DRM+	The Spectral Emission Limits for HD Radio/DRM+ should comply the ITU-Rec. amended to date.

3.9. TESTING/CHECKING OF DIGITAL COMPATIBILITY OF THE OFFERED FM TRANSMITTER IN HD Radio OR **DRM+ MODE DURING PDI:**

S. No.	Parameter	Value Range	MER	Remarks
1.	Analog Power	5kW + Headroom (10%)	NA	Pure Analog Mode
2.	Pure Digital Mode (DRM+)	≥ 1.25kW (Digital)		NA for HD Radio
3.	Pure Digital Mode (HD Radio) Side bands only	≥ 1.25kW (Digital)		NA for DRM+
4.	Normal HD Radio Mode	400W (Digital) + 3kW or more (Analog)		NA for DRM+

3.10 TECHNICAL SPECIFICATIONS OF REMOTE MONITORING AND CONTROL FACILITY:

S. No.	TECHNICAL PARAMETERS	TECHNICAL SPECIFICATIONS
1.	Remote Monitoring and Control Facility (Controllable Settings/Parameters)	1. Transmitter: ON/OFF 2. Selection of Transmitter 1/2 3. Exciter: ON/OFF 3. Selection of Exciter1/2 4. RF Output Power Level Control 5. Audio input level
2.	Remote Monitoring and Control Facility (Monitorable Settings/Parameters)	1. RF forward and reflected power of Transmitter 2. RF forward and reflected power of Exciter 3. RF forward and reflected power of each Power Amplifier 4. Power supply status i.e. Voltages, Currents etc. 5. Alarm Indications: Temperature, VSWR, ON AIR, Audio etc. 6. Any other parameters which the manufacturer considers essential for proper control /functioning of a remote-controlled FM transmitter.
3.	Data Format	To be indicated by tenderer and compatible for above system.
4.	Data Rate	To be indicated by tenderer and compatible for above data format.
5.	Software and Hardware Items	Software and complete hardware items required for remote monitoring and control of transmitter shall be part of the supply of the transmitter. Details of offered items are to be given by the tenderer.
6.	General Purpose PC	11^{th} Generation or higher, Intel Core i7 processor or higher, minimum 19" FHD Screen, 16 GB RAM, Windows-10 or latest Operating System, Hard drive (Solid State Drive) $\geq$ 512GB, USB 3.2 ports, USB 2.0 ports, Headset Jack, HDMI (2.0), RJ-45, Keyboard, Mouse etc.

SECTION IV- TECHNICAL SPECIFICATION OF ASSICIATED EQUIPMENTS/ITEMS
SECTION-IV (A) - TECHNICAL SPECIFICATIONS OF DUMMY LOAD AND THRU LINE RF POWER METER

4.1 Dummy Load: One number, 10 kW forced air cooled Dummy Load, 50 Ω are to be quoted for transmitter as per technical specifications given below.

S. No.	TECHNICAL PARAMETERS	TECHNICAL SPECIFICATION
4.1.1	Power Rating	10 kW continuous
4.1.2	Connector	1-5/8" EIA Flange
4.1.3	Frequency Range	88 to 108 MHz
4.1.4	VSWR	≤ 1.10:1
4.1.5	Impedance(Nominal)	50 Ω
4.1.6	Load Cooling	Forced Air cooled
4.1.7	AC Power Supply	As per Section –I
4.1.8	Dimensions (Length x Width x Depth)	To be given by the tenderer.
4.1.9	Weight	To be given by the tenderer.
4.1.10	Environmental Conditions	As per Section –I

THRU LINE RF POWER METER

S. No.	TECHNICAL PARAMETERS	TECHNICAL SPECIFICATION
4.1.11	RF Power Meter (dual type) with simultaneous display and measurement of both FORWARD & REFLECTED power suitable for mounting in 19" rack with separate Transducers/Sensing elements for measuring forward (≤ 10 kW) & reflected (≤ 1.0 kW), elements sockets, line section and 1-5/8" EIA flanges including all accessories, cables complete (2 Nos.) as per specifications for connecting with the rigid line.	1 Set
4.1.12	Power Rating: Forward Power	10 kW continuous
4.1.13	Power Rating: Reflected Power	1.0 kW
4.1.14	Frequency Range	88 MHz to 108 MHz
4.1.15	VSWR	≤ 1.1:1
4.1.16	Impedance	50 Ω
4.1.17	Accuracy	± 5% or better
4.1.18	Directivity of Line Section	30 dB or better
4.1.19	VSWR of Line Section	≤ 1.05:1
4.1.20	AC Power Supply	As per Section –I
4.1.21	Dimensions (Length × Width ×Depth)	To be given by the tenderer.
4.1.22	Weight	To be given by the tenderer.
4.1.23	Environmental Conditions	As per Section –I

SECTION-IV(B)-TECHNICAL SPECIFICATIONS OF MOTORISED RF CO-AXIAL CHANGEOVER SWITCH

4.2 Motorized RF Co-axial Changeover switch: Four ports, 1-5/8" Motorized RF coaxial Changeover switch fitted with 1-5/8" matching EIA flanges for connecting rigid line, including control panel, is to be quoted as per technical specifications given below. RF coaxial switch should work in manual mode also.

S. No.	TECHNICAL PARAMETERS	TECHNICAL SPECIFICATIONS
4.2.1	No. of Ports	4
4.2.2	Input Ports, Output Ports, Termination/Dummy Load Port	1-5/8" EIA male
4.2.3	Frequency Range	88 MHz to 108 MHz
4.2.4	Impedance (Nominal)	50 Ω
4.2.5	Power Supply	As per Section –I
4.2.6	Control Voltage	As per Section –I
4.2.7	Average Power Handling Capacity	> 12.0 kW
4.2.8	Isolation	> 60 dB
4.2.9	VSWR	≤ 1.05
4.2.10	Insertion loss	≤ 0.05 dB
4.2.11	Mechanical life	≥ 1, 00, 000 operations
4.2.12	Switching time	≤ 2 sec.
4.2.13	Signaling and Interlock Contacts	The interlock contacts should be coupled with RF contacts for interrupting RF power before and during switching. They should open before the RF contacts separate and closes after the RF contacts are in their new position. The auxiliary contacts should be suitably rated. Status of RF Switch contact position should be displayed only when it is in proper contact.
4.2.14	Dimensions (Length × Width × Depth)	To be given by the tenderer.
4.2.15	Weight	To be given by the tenderer.
4.2.16	Control panel	Suitable for above Motorized RF co-axial Changeover switch.
4.2.17	Environmental Conditions	As per Section-I

SECTION –IV (C) -TECHNICAL SPECIFICATION OF RF COAXIAL COPPER RIGID LINES & ASSOCIATED ACCESSORIES

4.3 Transmitter power will be fed to the Antenna System by an internal 1-5/8" RF coaxial copper rigid line and then an external air dielectric RF coaxial cable of suitable size.
Following are the Technical Specifications of RF coaxial copper rigid lines & associated accessories: All RF coaxial copper rigid lines with associated accessories are to be offered as per details given in SECTION-V(A). RF coaxial copper rigid lines and associated accessories should be of standard make.

S. No.	TECHNICAL PARAMETERS	TECHNICAL SPECIFICATION
4.3.1	Size	1-5/8"
4.3.2	Attenuation @100 MHz at 20°C	≤ 0.65 dB/100M
4.3.3	Average power handling capacity at ambient temperature 40°C	≥ 12 kW
4.3.4	Frequency Range	88 MHz-108 MHz
4.3.5	Impedance	50 Ω
4.3.6	Material for Outer & Inner Conductor of Rigid lines	High conductivity copper conforming to 95% IACS/99% purity
4.3.7	Material for Outer Conductor for Elbows & Adapters	Copper/ Copper alloy
4.3.8	Material for Inner Conductor for Elbows, Adapters and for all the entire support inner bullets	Silver-plated brass/ Silver-plated Copper
4.3.9	Material for all the support insulators	High quality Virgin Teflon (PTFE)

SECTION V (A): Schedule of Requirements/ Materials (Unpriced) for One Set of 5kW Digital Compatible (HD Radio & DRM+) VHF FM Solid-state MOSFET technology based broadcast transmitter in (1+1) configuration with automatic changeover unit and associated equipments/items

{The tenderer must quote all items}

S. No.	Description	Make	Model	Qty.
1.	(i) Supply of 5kW Digital Compatible (HD Radio & DRM+) VHF FM solid state MOSFET technology based broadcast Transmitter in (1+1) configuration including 4 Nos. of Exciter units in total, against both the transmitters including technical manuals as per AIR Specifications.			1 Set Complete
	(ii) Supply of Automatic changeover unit for 5 kW Digital Compatible VHF FM solid state MOSFET technology based broadcast Transmitter in (1+1) configuration complete with all accessories as per specification.			1 Set Complete
	(iii) Supply of Software & Hardware items required for Remote Monitoring & Control facilities as per AIR specifications			1 Set Complete
2.	Supply of General Purpose PC for Remote Monitoring & Control facilities complete as per AIR specifications (COTS item)			1 Set Complete
3.	Supply of complete installation material as given below such as RF Coaxial rigid lines, elbows, couplings & matching reducers, wherever necessary to complete the installation for feeding to the Antenna & Dummy Load as per AIR specifications. [Rates per meter/number shall also be quoted in addition to rates of quantity given in column (5)]			
3.1	1-5/8″ RF coaxial copper Rigid (complete with outer, inner & insulators)			24 M
3.2	1-5/8″ Un-flanged 90º Elbow with equal leg (complete with outer, inner & insulators)			12 Nos.
3.3	1-5/8″ Clamp type Coupling (complete with outer, inner & insulators)			16Nos.
3.4	1-5/8″ to N Test Reducer			2 Nos.
3.5	1-5/8″ Field Flange (Clamp type)			7 Nos.
3.6	Hanger for 1-5/8″ RF coaxial Rigid Line			16Nos.
4.	Supply of 10 kW Forced air cooled Dummy Load, 50 Ω as per AIR specifications.			1 Set complete
5.	Supply of RF Power Meter (dual type) with simultaneous FORWARD & REFLECTED power measurement suitable for mounting in 19" rack with separate Transducers/Sensing elements for measuring forward (≤ 10 kW) & reflected (≤ 1.0 kW), elements sockets, line section and 1-5/8" EIA flanges including all accessories, cables complete (2 Nos.) as per specifications for connecting with the rigid line.			1 Set Complete
6.	Supply of Four ports, 1-5/8" Motorized RF coaxial changeover switch with 1-5/8" matching EIA flanges for connecting rigid line including control panel as per AIR specifications.			1 Set Complete
7.	Supply of any other items/accessories required for the completeness of the system. Items wise details (including part number, if any) are to be given by the tenderer). **State NA, if not applicable.**			1 Lot
8.	Inspection charges as per AIR specification.			1 Lot

SECTION V (B): Schedule of Requirements/ Materials (Unpriced) for One Set of 5kW Digital Compatible (HD Radio & DRM+) VHF FM Solid-state MOSFET technology based broadcast transmitter in (1+1) configuration with automatic changeover unit and associated equipments/items SPARE (OPTIONAL) {The tenderer must quote all items}

S NO.	Description	Make	Model	Qty.
1.	Supply of 5kW Digital Compatible (HD Radio & DRM+) VHF FM Solid-state MOSFET technology based broadcast transmitter (Single Unit) with two Exciters as per AIR Specification.			1 Set Complete
2.	Supply of Exciter Unit			1 Set Complete
3.	Supply of Power Amplifier Module			1 Set Complete
4.	Supply of Power Supply Unit for Exciter Unit			1 Set Complete
5.	Supply of Power Supply Unit for Power Amplifier Unit			1 Set Complete
6.	Supply of RF Power Combiner Unit (5kW)			1 Set Complete
7.	Supply of Automatic Changeover Unit			1 Set Complete
8.	Supply of LPF/BPF/Harmonic filters (if used in the Power Amplifier output Stage)			1 Set Complete
9.	List of recommended PCB spares for Exciter Unit			1 Set Complete
10.	List of recommended PCB spares for PA Unit			1 Set Complete
11.	List of recommended PCB spares for ACU			1 Set Complete
12.	List of recommended PCB spares for Power supply Unit			1 Set Complete
13.	List of required equipments/items (with their Make & Model) for future up-gradation of offered transmitter into HD Radio & DRM+ mode.			1 Set Complete

Annexure-I

INSPECTION OF TRANSMITETRS

The inspection for acceptance of the transmitter equipment on dummy load will be carried out at OEM's Works Place by Engineers of All India Radio (AIR) in accordance with Acceptance Test Procedure/Protocol (ATP). All facilities like complete set of measuring instruments, power supply, manual assistance etc. will be provided by the tenderer/OEM. Complete details and specifications of the transmitter will be checked and all parameter values will be measured.

All the testing/measurements including Operational & functional checking of the transmitter during PDI will be carried out at 110% of the rated output power of the offered transmitter.

The tenderer is also required to demonstrate the digital compatibility of the offered VHF FM transmitter in HD Radio **OR** DRM+ mode during PDI. All measurements applicable for HD Radio/DRM+ mode shall also check as per AIR specifications. All necessary equipments required for checking the compatibility of the offered FM transmitter in HD Radio or DRM+ mode during inspection will be arranged by the tenderer.

All the spares ordered as per AT will be tested in actual circuit during inspection by Engineers of AIR.

Testing/measurements including operational & functional checking of all the transmitters shall be carried out at three different frequencies **including** operating frequency of the transmitter in the VHF Band i.e. 88 MHz to 108 MHz as per approved ATP.

Exhaustive checking and measurements will be carried out so as to completely check the compliance of the transmitter and its sub systems with the requirements as projected in the specifications.

Testing/measurements including Operational & functional checking of the transmitter will be carried out on three phase, 4-wire, 400 Volt (rms) ± 10%, 50 Hz ± 4% power supply available at the transmitter's input circuit breaker without any outside transformer unit etc. No other voltage will be acceptable to AIR at the transmitter's input circuit breaker, failing which the transmitter equipment is liable to be rejected. The technical facilities/equipment for varying within ± 10% of 400Volts (rms), three phase, 4-wire, should be available for Testing/measurements including Operational & functional checking of the transmitter during the inspection. The performance of transmitter as per parameters in Section-III shall be guaranteed without degradation with the given power supply tolerances.

It is mandatory that testing/measurements including operational & functional checking of all the transmitters as per approved ATP at three different frequencies including operating frequency of the transmitter in the VHF Band i.e. 88 MHz to 108 MHz without change of components/ settings/tuning are carried out well in advance. These measurements as per approved ATP must be submitted to All India Radio along with the call for inspection of transmitters for analyzing etc. These measurement details etc. must also be available at the time of inspection.

Following information should also form part of above data which will also be checked for each transmitter during inspection by AIR Inspecting Engineers**:-**

1. Origin of Country, Make, Type, Model & name of all units of transmitter, associated equipments/items and spares.
2. Dimensions of transmitter rack, sub-units, other items & accessories.
3. Working/operation of all sub-units and accessories.
4. System configuration check and completeness of transmitter.
5. Checking meter readings and calibration.
6. Checking of control and protection system of transmitter.
7. Checking of all power levels, meters, LEDs etc.
8. Checking of RF voltages on test points.
9. Inter-changeability of PAs, sub-modules etc.
10. Exciter operation, checking and measurements.
11. Working of Exciter in all mode including modulating inputs as per specifications.
12. Measurement of levels in the whole AF and RF chain.
13. Checking of all spares, PCB's, modules for the respective transmitter, other items & accessories.

ANNEXURE-II

TRANSMITTER TECHNICAL DATA TO BE SUBMITTED BY THE TENDERER

S. No.	Description	Details to be submitted by the tenderer		
1.0	Transmitter dimensions:	Width: ……(mm)	Height: ……(mm)	Depth: ……(mm)
2.0	Transmitter weight:	…….. kg		
3.0	Transmitter Heat dissipation at 5kW RF output:	…….. kW …….. BTU/ Hr		
4.0	Transmitter Air –conditioning requirement:	…….. TR		
5.0	Number of racks:	…… Number		
6.0	Size of racks: Transmitter rack dimensions:	Width: ……(mm)	Height: ……(mm)	Depth: ……(mm)
7.0	Blower/Fan of cooling system (Total No. of Blowers/fans)	……. Number		
8.0	Power consumption at 5kW RF output:	…….. kW		
9.0	**Typical Power supply line voltages (phase to phase voltages)**			
9.1	Voltage between Red phase & Yellow phase:	…… Volt		
9.2	Voltage between Yellow phase & Blue phase:	…… Volt		
9.3	Voltage between Blue phase & Red phase:	…… Volt		
10.0	**Typical Power supply phase voltages (phase to neutral voltages)**			
10.1	Voltage between Red phase & Neutral:	…… Volt		
10.2	Voltage between Yellow phase & Neutral:	…… Volt		
10.3	Voltage between Blue phase & Neutral:	…… Volt		
11.0	**Typical Power supply line current/phase current**			
11.1	Line current/Phase current (Red phase):	…… Amp.		
11.2	Line current/Phase current (Yellow phase):	…… Amp.		
11.3	Line current/Phase current (Blue phase):	…… Amp.		
11.4	Neutral current:	…… Amp.		
12.0	**Power factor:**	**……**		

ANNEXURE-III

PERFORMA FOR INFORMATION ABOUT LOCAL OFFICE /AUTHORIZED REPRESENTATIVE/ DEALER IN INDIA FOR AFTER SALES SUPPORT

1.	Address of local office/authorized representative/ dealer	
	Telephone (Landline) No.	
	Mobile No.	
	E-mail Address	
2.	Address for communication (if different)	
3.	Legal Status (local office/authorized representative/dealer)	
4.	Name, contact number (Mobile number) & e-mail address of official representative of the local office/authorized representative/dealer	
5.	Brief details of Technical facilities available for after sales support: The details of technical facilities available with local office/authorized representative/dealer for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.	
6.	Main line of business, specialization and number of years of operation	
7.	Total number of permanent technical employees including their designation and qualification	
8.	Details of Agreement/MoU for after sales support with OEM (Copy must be provided with the offer)	Date of Agreement: Executed at : Executed by :

(Authorized Signatory of local office/authorized representative/dealer) Name : Signature :	**(Authorized Signatory of transmitter OEM)** Name : Signature :
Place and Date:	Place and Date:

Annexure-IV

List of places (to be supplied at D-6 Godown, New Delhi)

PRASAR BHARATI
(*India's Public Service Broadcaster***)**
DIRECTORATE GENERAL: ALL INDIA RADIO
(PLANNING & DEVELOPMENT UNIT)
*****

SPECIFICATIONS FOR SUPPLY OF STEREO FM DIGITAL AUDIO BROADCAST PROCESSOR -*5 Nos.*

CONTENTS

A. ESSENTIAL REQUIREMENTS FOR TENDER:

1. (i) The tenderer should submit Schedule of Requirements/Materials of Supply **without *price* *in the same format as given in Section-4.0 (I & II)*** of AIR Specifications in the technical bid, failing which the tender shall be considered incomplete and is liable to be rejected.

   (ii) It is also mandatory to mention ***Make & Model of the offered equipment*** in the Schedule of Requirements/Materials of Supply, failing which the tender shall be considered incomplete and is liable to be rejected.

   (iii) Make/Model and detailed specifications of the equipments/items being offered shall be mentioned categorically, to access the full merit of the offer, failing which tender shall be considered incomplete and is liable to be rejected. **Broader terms viz. Equivalent/similar will not be accepted.**

2. Each statement of this specifications has to be complied with & supported by printed technical literature, technical data sheets, schematic drawings and technical manuals from the manufacturer of the equipment by the tenderer, to assess the full merit of the offer without which tender will be considered incomplete and is liable to be rejected.

3. The tenderer should submit the tender offer to AIR in the format given below, section wise & clause wise, in respect of all the sections of technical specifications. The OEM/tenderer must provide the page number reference, in column (4) of the table given below, of the technical bid clearly indicating the volume number also, if any, for each supporting document to verify the parametric values shown in the compliance statement, to assess the full merit of the offer, failing which the tender shall be considered

incomplete and is liable to be rejected.

S. No. of AIR Specifications (Section wise & Clause wise) (1)	Details of AIR Specifications (Part/ Section wise & Clause wise) (2)	Compliance **(Yes/No)** (3)	The page no. of the tender offer, where the information/ supporting document is available. (4)	Remarks (5)
A. Essential requirement for tender				
B. Essential eligibility criteria for tenderers				
Section-1 Clause wise				
Section-2 Clause wise				
Section-3 Clause wise				
Section-4 Clause wise				

4. The tenderer should quote the rate/cost of individual items in the tender offer while submitting the tender offer for spares **(OPTIONAL)** in commercial bid. ***Optional items will not be considered for ranking purpose.***

5. The complete technical specifications (Section wise & Clause wise) compliance statements along with Schedule of Requirements/Materials (un-priced) must be signed & stamped by the respective Original Equipment Manufacturer (OEM) in the tender document, failing which the tender shall be considered incomplete and is liable to be rejected.
   In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp the complete Technical specifications (Section wise & Clause wise) compliance statements, failing which the tender shall be considered incomplete and is liable to be rejected. The OEM & tenderer should mention their name & designation of the signatories with full address, phone number, e-mail addresses etc.

6. The authorization and guarantee must be given by respective Original Equipment Manufacturer (OEM) on their letter head pad duly signed & stamped. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also give guarantee on their letter head pad duly signed & stamped, failing which the tender shall be considered incomplete and is liable to be rejected. Guarantee shall be as per the format given in AIR specification.

7. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer should also furnish a certificate from the OEM that the tenderer can quote items of the OEM directly, failing which the tender shall be considered incomplete and is liable to be rejected without any notice/back reference.

8. Any change in the AIR technical specifications format or language or in parameters or of any other nature including the deletion/addition of technical specifications clause, words, lines in the technical specifications compliance statement by the OEM/ tenderer will not be acceptable to AIR and the tender is liable to be rejected.

9. Prasar Bharati will follow the reciprocal market access strategy of the Government of India, which describes on the Clause 10(d) of Public Procurement Preference to Make in India, Order 2017. The Purchaser shall have right for not consider any Bid and may restrict such Bidders from the bidding process; who originate from those countries, where they do not allow market access for Indian companies; in such cases, the Clause 10 (d) of Public Procurement Preference to Make in India, order 2017, shall be invoked wherever applicable, when it is relevant.

10. Amendment in General Financial Rules (GFRs), 2017-Golobal Tender Enquiry issued vide F. No. 12/17/2019-PPD dated 15.05.2020 of Government of India, Ministry of Finance, Department of Expenditure, Public Procurement Division shall be applicable.

B. ESSENTIAL ELIGIBILITY CRITERIA FOR TENDERER:

a. The tenderer shall be from India only.

b. The tenderer should either be the OEM of Stereo FM Digital Audio Broadcast Processor or their authorized representative/dealer.

c. In case the tenderer is the authorized representative/dealer, the tenderer must be an authorized representative/dealer of any OEM of Audio Broadcast Processor for last three years or more **OR** must be in the business of sales and supply of Audio Broadcast Processor for last three years or more. Documentary evidence to support this must be provided.

d. (i) The OEM of the Stereo FM Digital Audio Broadcast Processor must have an experience of manufacturing and supplying Stereo FM Digital Audio Broadcast Processor for at least last 7 years. Documentary evidence to support this must be provided.

(ii) The OEM should have supplied Stereo FM Digital Audio Broadcast Processor to reputed/public broadcasters. The OEM must provide the details of past supply record (**in the format given below)** for at least 25 Nos. of such offered Stereo FM Digital Audio Broadcast Processor, supplied during last 7 years ending last day of the month previous to the one in which the tender is invited.

Supply Order No. with date	Type & Model of the supplied Stereo FM Digital Audio Broadcast Processor	Qty.	Name of the broadcaster with full postal address including e-mail address to whom Stereo FM Digital Audio Broadcast Processor was supplied.	Remarks
(1)	(2)	(3)	(4)	(5)

(iii) All India Radio reserves the right to get performance feedback of the Stereo FM Digital Audio Broadcast Processor from any of the above broadcasters named by the tenderer/OEM.

(iv) Copies of supply order/completion certificates/delivery challans/invoice of at least 15 Nos., out of the 25 Nos. of Stereo FM Digital Audio Broadcast Processor submitted by the tenderer in above format, are also to be enclosed by the tenderer.

e. The OEM of the offered Stereo FM Digital Audio Broadcast Processor must have his local office/authorized representative/dealer in India for after sales support. **A certificate as per Annexure-I** duly signed by the OEM as well as local office/authorized representative/dealer must be submitted with the offer. Copy of Agreement/MoU executed between OEMs and their authorized representative/dealer duly signed by both must also be submitted with the offer.

SECTION-1.0

GENERAL SPECIFICATIONS:

1.0 Stereo FM Digital Audio Broadcast processor equipment as per AIR specification shall be used for round the clock for continuous operation without any interruption in VHF FM broadcast service at AIR station for FM /AM transmitter/studio setup.

The offered equipment/items as per specification shall be field proven for satisfactory operation.

1.1 GENERAL TERMS AND CONDITIONS: Please refer tender documents for general terms and conditions of contract for supply including all the commercial aspects like, Packing and Packing List, Insurance and Marine Risk etc., Payment terms, Penalty/Compensation for Delay, Damages and Liabilities, Time Period and Extension for Delay, Foreclosure of Contract due to Abandonment or Reduction in Scope of Supply, Cancellation of Contract in Full or Part, Recovery of Security Deposit, Performance Guarantee, Unsatisfactory Workmanship, Damages Incurred During transit, Tenderer Liable for Damages, Defects, Recovery of Compensation, Ensuring Payment and Amenities, Tenderer to Indemnify Government against Patent Rights, Release of Security Deposit, Safety Code, insurance from manufacturer's works/factory to respective site etc **i.e. in totality**.

1.2 INSPECTION:

1.2.1 Detailed Pre-dispatch Inspection (PDI) of Stereo FM Digital Audio Broadcast processor will be carried out at OEM's Works by **two Engineers** of All India Radio as per details given in Section-3.0.

1.2.2 Call for Pre-dispatch Inspection (PDI) is to be given by the tenderer to All India Radio at least **8 weeks** in advance. Inspection period shall be based on one working day for three Stereo FM Digital Audio Broadcast processors. Testing/measurements as per approved ATP must be submitted to All India Radio along with the call for PDI for analyzing etc.

1.2.3 For AIR inspecting engineers, expenses toward to and fro air journey, boarding, lodging etc. will be borne by All India Radio.

1.2.4 The complete Acceptance Test Procedure/Protocol (ATP) will be prepared by the OEM of the Stereo FM Digital Audio Broadcast processor and submitted to DDG (E-FM), P&D Unit, DG: AIR for approval within 15 days of issue of Acceptance of Tender. ATP will also indicate full details of setup for measuring/testing equipments to be deployed during the performance measurements/inspection. The **approved ATP** shall form the basis for performance measurements/inspection to be carried out. AIR has the right to include other technical parameters in ATP submitted by OEM within the ambit of specification of the product offered.

1.3 DOCUMENTS/INFORMATION TO BE SUPPLIED WITH THE TENDER:

(i) The complete technical specifications (Section wise & Clause wise) compliance statement alongwith Schedule of Requirements/Materials (un-priced) duly signed & stamped by the respective Original Equipment Manufacturer (OEM) and countersigned by the tenderer as per the format given above in clause A (3), to assess the full merit of the offer, **without which the tender offer will be considered incomplete and is liable for rejection.**

(ii) Complete printed technical literature/data sheet/schematic drawings/detailed information including technical manual of Stereo FM Digital Audio Broadcast processor and associated equipments/items as per Section-4.0 (I&II) from the Original Equipment Manufacturer (OEM) in support of compliance statement should be furnished for all the items of the tender, to assess the full merit of the offer, **without which the tender offer will be considered incomplete and is liable for rejection.**

(iii) Detailed Schedule of Requirements/Materials (un-priced) for supply of Stereo FM Digital Audio Broadcast processor should be in conformity with Section-4.0 (I&II) without any change in the format, **failing which, the tender will be considered incomplete and is liable for rejection**. The tenderer must quote all items.

(iv) Descriptive information and complete details of each equipment offered shall be given by the tenderer.

(v) Country of Origin, Make, Type & Model of all the offered items should be mentioned including the name & address of their vendors.

(vi) A copy of the Technical Manual must be enclosed with technical bid on non-refundable basis for assessing the complete Stereo FM Digital Audio Broadcast processor. The Technical Manual must include at least the details given below:

(a) General description of the offered Stereo FM Digital Audio Broadcast processor, block diagram/schematic drawings etc.
(b) Diagrams showing the isometric view of Stereo FM Digital Audio Broadcast processor equipment with dimensions in metres.
(c) Installation Manual & drawings with dimensions in respect of offered equipment.
(d) The procedure of settings Stereo FM Digital Audio Broadcast processor should be described in detail with practical examples.
(e) Photograph of the Stereo FM Digital Audio Broadcast processor showing Front, Rear, Side & Top view.
(f) **All *Do's and Don'ts* which are essential for safe Installation, Operation, Maintenance & Servicing of the Stereo FM Digital Audio Broadcast processor.**

1.4 DOCUMENTS/INFORMATION TO BE SUPPLIED BY THE TENDERER WITHIN 15 DAYS AFTER ISSUE OF ACCEPTANCE OF TENDER:

One set of Technical Manuals (for Installation, Testing, Commissioning, Operation, Maintenance & Servicing, including theory of operation and fault diagnosis) **COLOUR** printed and duly bound for Stereo FM Digital Audio Broadcast processor along with soft copy on pen drive must be supplied to "DDG(E-FM), P & D Unit, DG: AIR, New Delhi-110001" **for examination & approval.**

1.5 INFORMATION TO PRECEDE DESPATCH OF EQUIPMENT:

Following information should be supplied to the DDG(E-FM), P & D Unit, DG:AIR and each of the consignee prior to dispatch of Equipment:
a) Detailed list of equipment under dispatch.

1.6 DOCUMENTS/INFORMATION TO BE SUPPLIED ALONGWITH EQUIPMENT:

Technical manuals (for Installation, testing, commissioning, Operation, Maintenance & Servicing, including theory of operation and fault diagnosis) **COLOUR** printed and duly bound for Stereo FM Digital

Audio Broadcast processor and inspection report with soft copy on pen drive shall be supplied as per details given below: -

(i) For Consignee- 2 Sets of technical manual in hard copies printed and duly bound alongwith one soft copy on pen drive.

(ii) For the following Offices/Officers-One soft copy on pen drive for each offices/officers:
DDG(E-FM), DDG(E-TM), Zonal Office (Maintenance Wing of North zone), Zonal Office (Project Wing of North zone), Technical Library(P&D Unit), R&D & NABM (T)

1.7 GUARANTEE:

The tenderer shall submit with his tender an undertaking to accept the following guarantees:
{This Guarantee clause is applicable to all the equipments/items mentioned in Schedule of Requirements/Materials (un-priced)}.

(i) A guarantee that the equipment supplied will be in accordance with these specifications, varied only to the extent stated in his tender and agreed to in the contract.

(ii) A guarantee to make good within 15 days (from the date of first intimation to OEM/tenderer) at tenderer's expense any component which becomes defective under normal operating conditions, for **60 months** from the date of supply at D-6 Godown Delhi. If the tenderer failed to rectify the fault within the stipulated period of 15 days, the guarantee period for that particular location (site) would be extended corresponding to the outage period.

(iii) A guarantee to supply all components for a period of ten years from the date of acceptance of Equipment at site, at rates at which these are being supplied by him to other customers and also should match prices of original manufactures of these components prevailing at that time.

(iv) If at any stage during next 10 years, the manufacturer stops production of this model of Equipment, he shall intimate All India Radio in advance to enable the latter to stock the critical items.

1.8 LANGUAGE/UNITS:

All information supplied by the Tenderer & all markings, notes, designation on the drawings & associated write-ups shall be in "**English language"** only.
All dimensions, units on drawings, all references to weights, measures & quantities shall be in MKS.

1.9 DELIVERY OF EQUIPMENT:

Supply will have to be completed within **SEVEN MONTHS** from the date of Acceptance of Tender.

1.10 PACKING AND PACKING LISTS:

All the equipment should be securely and properly packed to withstand transit hazards. Equipment packing shall be fit for sea freight and incorporate adequate protection against ingress of moisture. Packing slips giving details of the items contained in each package shall be placed inside the package in a water proof envelop to enable easy identification and should contain cross references to item/part numbers of installation drawings/components lists. Copies of packing slips and other details should be sent separately to respective consignee and also to the DDG(E-FM), P & D Unit, DG: AIR, New Delhi.

1.11 INSURANCE AND MARINE RISKS ETC:

Please refer to commercial terms.

1.12 POWER SUPPLY FOR ALL EQUIPMENT:

(i)	Operating Line voltage	AC Single Phase, 230 Volts ± 10 %
(ii)	Frequency	50 Hz ± 4%

1.13 ENVIRONMENTAL CONDITIONS FOR EQUIPMENT:

Outside temperature range : -30º C to + 40º C
Ambient temperature range for operation : 0º C to + 40º C
Relative humidity : 95 percent, non-condensing
Working altitude : Up to 4500 meters AMSL

The OEM of the equipment is required to submit supporting technical documentary proof along-with tender documents in order to confirm/verify that the offered equipment shall work without any de-gradation in the performance of the offered equipment under above mentioned environmental conditions.

1.14 MAINTENANCE SUPPORT AND SPARES:

(a) The minimum recommended essential spares shall be quoted separately by the tenderer.
(b) The minimum recommended essential spares may be based on predicted rate of failure.
(c) In case, the tenderer quotes the optional items as 'a set', the details of the components/items offered in the 'set' must be spelt out clearly including their Make & Model and quantity.

1.15 ESSENTIAL REQUIREMENT FOR LOCAL OFFICE/AUTHORIZED REPRESENTATIVE/ DEALER IN INDIA:

(a) The OEM should have complete setup for maintenance/repair of the Stereo FM Digital Audio Broadcast Processor in India, either of its own or through local office/authorized representative/dealer.
(b) The local office/authorized representative/dealer will be the nodal point for resolving issues related to after sales support. It is the responsibility of local office/authorized representative/dealer to arrange the repair/replacement of faulty items. Any module of Stereo FM Digital Audio Broadcast Processor requiring repairs will be repaired at site. If it is not feasible to repair the module at site, the same will be collected from the site by local office/authorized representative/dealer that will arrange repairs locally. The cost of transportation, repairs etc. shall be borne by the tenderer during the guarantee period.

(c) After sales support for the repairs/maintenance of Stereo FM Digital Audio Broadcast Processor after the completion of guarantee period, shall also be provided by the OEM of the Stereo FM Digital Audio Broadcast processor through their local office/authorized representative/dealer in India.
(d) The details of technical facilities available with local office/authorized representative/dealer **for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.**
(e) At the discretion of AIR, AIR representative(s) may visit the works of local office/authorized representative/dealer of OEM in India to ensure/verify that adequate technical infrastructure is available for after sales service for timely resolving the issues related to attending/replacing the equipments. Tenders from the tenderers who failed to meet these criteria shall be considered incomplete and is liable to be rejected.

SECTION-2.0

2.1 SALIENT FEATURES:

a. The specification for Stereo FM Digital Audio Broadcast Processor is meant for broadcast purpose in the audio chain of VHF FM transmitters.
b. It should have Digital Signal Processing technique.
c. It should be able to provide multi band (minimum 5) compression, limiting and clipping, automatic wideband gain control.
d. The processed audio should be free from Phase distortion. It should also have provision for stereo enhancement and high/low frequency enhancement.
e. It should have in-built feature of multiple user and system configuration pre-sets. The user audio pre-sets and system configuration pre-sets should be stored in the memory and without any battery backup. By using the processor user pre-set, the factory pre-set of the Processor should not change.
f. The equipment shall be capable for continuous operation to ensure the uninterrupted broadcast without degradation in performance.
g. The equipment should have system audio bypass functionality with adjustable gain setting to completely defeat the processing for test and alignment.

2.2 The Stereo FM Digital Audio Broadcast Processor should accept following inputs.

2.2.1 AES/EBU inputs
2.2.2 Analog left-right inputs
2.2.3 Sub-carrier inputs (Subsidiary Channel Authorization and Radio Data System/Radio Broadcast Data System i.e. SCA and RDS/RBDS)

2.3 The Stereo FM Digital Audio Broadcast Processor should give following outputs.

2.3.1 AES/EBU output
2.3.2 Analog left-right output
2.3.3 Two Composite stereo output/ multiplexed output with individual level control. These outputs will be ITU-R BS 412 compliant as per sub-clause 2.5.1 under clause 2.5 (Technical conditions) of section 2.0 of Rec. ITU-R BS 412-9.
2.3.4 Pilot tone output for synchronization of external devices etc.

2.4 Necessary function switches such as level/gain control etc. should be available on the front panel. All these control shall be rugged and reliable.

2.5 The Stereo FM Digital Audio Broadcast Processor should have visual monitoring and real time level monitoring of various technical parameters on the front panel and a compact one unit for ease of operation.

2.6 It should be capable for remote control operation and should be SNMP compliant. It should have visual monitoring of various technical parameters remotely through PC etc. The tenderer will also provide MIB file.

2.7 Radio Frequency Interference (RFI)/Electromagnetic Interface (EMI) filter shall be provided at mains input of the Stereo FM Digital Audio Broadcast Processor as per relevant provisions of standards for effective rejection of the interference from the high power FM/AM transmitters operating in the premises.

TECHNICAL SPECIFICATIONS:

S. No.	TECHNICAL PARAMETERS	TECHNICAL SPECIFICATIONS
2.8	**ANALOG AUDIO INPUT**	
2.8.1	Configuration	Stereo
2.8.2	Nominal Input Level	Software adjustable from -4.0 to +12.0 dBu.
2.8.3	Maximum Input Level	+22 dBu
2.8.4	Connectors	Two XLR-type, female, EMI-suppressed.
2.8.5	A/D Conversion	Minimum 24-bit
2.8.6	Input Impedance	≥10 k Ω
2.9	**ANALOG AUDIO OUTPUT**	
2.9.1	Configuration	Stereo. Flat or pre-emphasized (at 50 µs), software-selectable.
2.9.2	Output Level (100% peak modulation)	Adjustable from -4 dBu to +20 dBu peak, into 600 Ω or greater load, software-adjustable.
2.9.3	Signal to Noise Ratio (referenced to 100% modulation, 20 Hz to 15 kHz)	≥ 80 dB unweighted
2.9.4	Total Harmonic Distortion plus Noise (THD+N) (20 Hz to 15 kHz)	≤ 0.02 %
2.9.5	L/R Cross Talk (20 Hz to 15 kHz)	≥ 70 dB
2.9.6	Connectors	Two XLR-type, male, EMI-suppressed.
2.9.7	D/A Conversion	Minimum 24-bit
2.9.8	Frequency response (20 Hz to 15 kHz)	± 0.5dB
2.9.9	Output Impedance	<50 Ω
2.10	**DIGITAL AUDIO INPUT**	
2.10.1	Configuration	Stereo, AES/EBU standard, 24-bit resolution.
2.10.2	Sampling Rate	32 kHz /44.1 kHz, 48kHz automatically selected.
2.10.3	Connector	XLR-type, female, EMI-suppressed, 110 Ω
2.10.4	Input Reference Level	Variable within the range of -25 dBFS to - 6 dBFS
2.10.5	De-emphasis	50 µs Software-selectable
2.11	**DIGITAL AUDIO OUTPUT**	
2.11.1	Configuration	Stereo, AES/EBU standard
2.11.2	Sample Rate	32 kHz /44.1 kHz, 48kHz selected in software
2.11.3	Connectors	XLR-type, male, EMI-suppressed
2.11.4	Output Level (100% peak modulation)	-20 dBFS to 0 dBFS, software-controlled.
2.12	**COMPOSITE BASEBAND OUTPUT**	
2.12.1	Configuration	Two outputs with independent level control.
2.12.2	Maximum Output Level	+12 dBu
2.12.3	D/A Conversion	Minimum 24-bit
2.12.4	Signal to Noise Ratio (referenced to 100% modulation, 20 Hz to 15 kHz)	≥80 dB unweighted
2.12.5	Total Harmonic Distortion plus Noise (THD+N) (20 Hz to 15 kHz)	≤ 0.02%
2.12.6	Stereo Separation at 100% modulation (30 Hz to 15 kHz)	≥ 55dB

2.12.7	Cross talk Linear (main channel to sub-channel or sub-channel to main channel) referenced to 100% modulation	Better than 70 dB
2.12.8	38 kHz Suppression	≥ 70 dB (referenced to 100% modulation)
2.12.9	Pilot Protection	60 dB relative to 9% pilot injection, ± 250 Hz
2.12.10	Pilot Stability	19 kHz, ± 1.0 Hz
2.12.11	Pilot level	Adjustable from 6% to 12%, software controlled
2.12.12	57 kHz (RDS/RBDS)Protection	≥ 50 dB relative to 4% sub-carrier injection, ± 2.0 kHz
2.12.13	Connectors	Two BNC, EMI suppressed.
2.13	**REMOTE CONTROL INTERFACE**	
2.13.1	Configuration	TCP/IP via direct cable connect/modem/Ethernet interface.
2.13.2	Connectors	Ethernet (RJ-45)
2.14	**POWER**	
2.14.1	Voltage	AC Single phase, 230V ± 10 %, 50Hz ± 4 %
2.14.2	Connector	IEC (EMI suppressed). Detachable 3-wire power cord to be supplied.
2.14.3	Safety Standards	ETL listed to UL standards, CE marked.
2.15	**ENVIRONMENTAL CONDITIONS**	As per Section -1.0
2.16	Dimensions (Approximate) (W × H × D)	To be fitted in 19″ rack

2.17 The Stereo FM Digital Audio Broadcast Processor shall essentially have the following:

(i) Protection against current over-loads: The equipment should mute in case of overload and revert to normal functioning once overload ceases to exist.

(ii) Protection against RF: The equipment is to be provided with adequate interference shielding so as to perform satisfactory operation in the transmitter hall, without degradation in performance, which houses other high power FM/AM transmitters.

2.18 The equipment should have protection against open circuit, short circuit, ultrasonic frequencies and high RF fields.

2.19 An earth terminal shall be provided in the equipment body for connecting audio earth connection.

2.20 ACCESSORIES: All necessary accessories like connection cords and connectors shall be supplied along with the units. The standard accessories should be clearly mentioned in the tender. Also, optional accessories, if considered useful/recommended by the supplier, should be quoted separately with technical details.

SECTION 3.0

INSPECTION DETAILS

The pre-dispatch inspection for acceptance of the Stereo FM Digital Audio Broadcast Processor will be carried out at OEM's works by Engineers of All India Radio (AIR) in accordance with Acceptance Test Procedure/Protocol (ATP). All facilities like complete set of measuring instruments, power supply, manual assistance etc. will be provided by the tenderer. Complete details and specifications of the Stereo FM Digital Audio Broadcast Processor will be checked and all parameter values will be measured.

Operational checking of the complete Stereo FM Digital Audio Broadcast Processor and measurements will be carried out as per approved ATP. Complete list of these measuring equipments along with their set-up shall be forwarded along with the tender.

It is mandatory that all these checking and measurements i.e. Operational checking of the Stereo FM Digital Audio Broadcast Processor and measurements are carried out well in advance and these measurement details, graphical printouts and figures must be available, at the time of inspection. These must also be submitted to All India Radio along with the call for inspection of the Stereo FM Digital Audio Broadcast Processor well in advance for analyzing etc.

Following information should also form part of above data which will also be checked for each Stereo FM Digital Audio Broadcast Processor during inspection by AIR representative:

1. Make, Type, Model and Country of Origin of the Stereo FM Digital Audio Broadcast Processor, accessories and spares.

2. Measurements of all parameters as per Section-2.0 of Technical Specifications. All the parameters will be measured.

SECTION-4.0 (I)

SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) (FOR SUPPLY OF ONE SET OF STEREO FM DIGITAL AUDIO BROADCAST PROCESSOR)

S. No.	Description	Make	Model	Unit	Qty.
1.0	Supply of Stereo FM Digital Audio Broadcast processor equipment complete with all accessories including technical manuals as per AIR specification.			Set complete	1 Set complete
2.0	Supply of any other items/accessories offered for the completeness of the system (Items wise details of offered and included material with part numbers, if any are to be given by the tenderer) **State NA, if not applicable**			Lot	1 Lot
3.0	Inspection charges of Stereo FM Digital Audio Broadcast processor as per AIR specifications			Lot	1 Lot

SECTION-4.0 (II)

SPARE (OPTIONAL) SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) (FOR ONE SET OF STEREO FM DIGITAL AUDIO BROADCAST PROCESSOR)

S. No.	Description	Make	Model	Unit	Qty.
1.0	Supply of Stereo FM Digital Audio Broadcast processor equipment complete with all accessories as per AIR specification.			Set complete	1 Set complete
2.0	Supply of recommended spares (Items wise details of offered with part numbers, if any are to be given by the tenderer)			Lot	1 Lot

All India Radio at its own discretion may procure spares for a value not exceeding 10% of the cost of equipments. The tenderer should quote all the essential spares.

ANNEXURE-I

PERFORMA FOR INFORMATION ABOUT LOCAL OFFICE /AUTHORIZED REPRESENTATIVE/ DEALER IN INDIA FOR AFTER SALES SUPPORT

1.	Name with address of local office/authorized representative/ dealer in India	
	Telephone (Landline) No.	
	Mobile No.	
	E-mail Address	
2.	Address for communication (if different)	
3.	Legal Status (Whether local office/authorized representative/dealer)	
4.	Name, contact number (Mobile number) & e-mail address of official representative of the local office/authorized representative/dealer	
5.	Brief details of Technical facilities available for after sales support: The details of technical facilities available with local office/authorized representative/dealer for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.	
6.	Main line of business, specialization and number of years of operation	
7.	Total number of permanent technical employees including their designation and qualification	
8.	Details of Agreement/MoU for after sales support with OEM (Copy must be provided with the offer)	Date of Agreement: Executed at : Executed by :

(Authorized Signatory of local office/authorized representative/dealer) Name : Signature :	**(Authorized Signatory of Audio Broadcast Processor OEM)** Name : Signature :
Place and Date:	Place and Date:

ANNEXURE-II

List of places (to be supplied at D-6 Godown, New Delhi)

816606/2023/FM Design - P&D Unit

AIR Specification No. Monitor/16/ February/2023-D (TD/FM)

PRASAR BHARATI
(*India's Public Service Broadcaster***)**
DIRECTORATE GENERAL: ALL INDIA RADIO
(PLANNING & DEVELOPMENT UNIT)
*****

SPECIFICATION FOR SUPPLY OF FM MONO AND STEREO MODULATION MONITOR INCLUDING RF AMPLIFIER (STANDALONE UNIT) -*5 Nos.*

CONTENTS

A. ESSENTIAL REQUIREMENTS FOR THE TENDER:

1. (i) The tenderer should submit Schedule of Requirements/Materials of Supply **without *price* *in the same format as given in Section-4.0 (I & II)*** of AIR Specifications in the technical bid, failing which the tender shall be considered incomplete and is liable to be rejected.

   (ii) It is also mandatory to mention ***Make & Model of the offered equipment*** in the Schedule of Requirements/Materials of Supply, failing which the tender shall be considered incomplete and is liable to be rejected.

   (iii) Make/Model and detailed specifications of the equipments/items being offered shall be mentioned categorically, to access the full merit of the offer, failing which tender shall be considered incomplete and is liable to be rejected. **Broader terms viz. Equivalent/similar will not be accepted.**

2. Each statement of this specifications has to be complied with & supported by printed technical literature, technical data sheets, schematic drawings and technical manuals from the manufacturer of the equipment by the tenderer, to assess the full merit of the offer without which tender will be considered incomplete and is liable to be rejected.

3. The tenderer should submit the tender offer to AIR in the format given below, section wise & clause wise, in respect of all the sections of technical specifications. The OEM/tenderer must provide the page number reference, in column (4) of the table given below, of the technical bid clearly indicating the volume number also, if any, for each supporting document to verify the parametric values shown in the compliance statement, to assess the full merit of the offer, failing which the tender shall be considered incomplete and is liable to be rejected.

S. No. of AIR Specifications (Section wise & Clause wise) (1)	Details of AIR Specifications (Part/ Section wise & Clause wise) (2)	Compliance **(Yes/No)** (3)	The page no. of the tender offer, where the information/ supporting document is available. (4)	Remarks (5)
A. Essential requirement for tender				
B. Essential eligibility criteria for tenderers				
Section-1 Clause wise				
Section-2 Clause wise				
Section-3 Clause wise				
Section-4 Clause wise				

4. The tenderer should quote the rate/cost of individual items in the tender offer while submitting the tender offer for spares **(OPTIONAL)** in commercial bid. ***Optional items will not be considered for ranking purpose.***

5. The complete technical specifications (Section wise & Clause wise) compliance statements along with Schedule of Requirements/Materials (un-priced) must be signed & stamped by the respective Original Equipment Manufacturer (OEM) in the tender document, failing which the tender shall be considered incomplete and is liable to be rejected.
   In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp the complete Technical specifications (Section wise & Clause wise) compliance statements, failing which the tender shall be considered incomplete and is liable to be rejected. The OEM & tenderer should mention their name & designation of the signatories with full address, phone number, e-mail addresses etc.

6. The authorization and guarantee must be given by respective Original Equipment Manufacturer (OEM) on their letter head pad duly signed & stamped. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also give guarantee on their letter head pad duly signed & stamped, failing which the tender shall be considered incomplete and is liable to be rejected. Guarantee shall be as per the format given in AIR specification.

7. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer should also furnish a certificate from the OEM that the tenderer can quote items of the OEM directly, failing which the tender shall be considered incomplete and is liable to be rejected without any notice/back reference.

8. Any change in the AIR technical specifications format or language or in parameters or of any other nature including the deletion/addition of technical specifications clause, words, lines in the technical specifications compliance statement by the OEM/ tenderer will not be acceptable to AIR and the tender is liable to be rejected.

9. Prasar Bharati will follow the reciprocal market access strategy of the Government of India, which describes on the Clause 10(d) of Public Procurement Preference to Make in India, Order 2017. The Purchaser shall have right for not consider any Bid and may restrict such Bidders from the bidding process; who originate from those countries, where they do not allow market access for Indian

companies; in such cases, the Clause 10 (d) of Public Procurement Preference to Make in India, order 2017, shall be invoked wherever applicable, when it is relevant.

10. Amendment in General Financial Rules (GFRs), 2017-Golobal Tender Enquiry issued vide F. No. 12/17/2019-PPD dated 15.05.2020 of Government of India, Ministry of Finance, Department of Expenditure, Public Procurement Division shall be applicable.

B. ESSENTIAL ELIGIBILITY CRITERIA FOR TENDERERS:

a. The tenderer shall be from India only.

b. The tenderer should either be the OEM of FM Mono and Stereo Modulation Monitor or their authorized representative/dealer.

c. In case the tenderer is the authorized representative/dealer, the tenderer must be an authorized representative/dealer of any OEM of Modulation Monitor for last three years or more **OR** must be in the business of sales and supply of Modulation Monitor for last three years or more. Documentary evidence to support this must be provided.

d. (i) The OEM of the FM Mono and Stereo Modulation Monitor must have an experience of manufacturing and supplying FM Mono and Stereo Modulation Monitor for at least last **5 years.** Documentary evidence to support this must be provided.

(ii) The OEM should have supplied FM Mono and Stereo Modulation Monitor to reputed/public broadcasters. The OEM must provide the details of past supply record **(in the format given below)** for at least 20 Nos. of such offered FM Mono and Stereo Modulation Monitor, supplied during last **5 years** ending last day of the month previous to the one in which the tender is invited.

Supply Order No. with date	Type & Model of the supplied FM Mono and Stereo Modulation Monitor	Qty.	Name of the broadcaster with full postal address including e-mail address to whom FM Mono and Stereo Modulation Monitor was supplied.	Remarks
(1)	(2)	(3)	(4)	(5)

(iii) All India Radio reserves the right to get performance feedback of the FM Mono and Stereo Modulation Monitor from any of the above broadcasters named by the tenderer/OEM.

(iv) Copies of supply order/completion certificates/delivery challans/invoice of at least 10 Nos., out of the 20 Nos. of FM Mono and Stereo Modulation Monitor submitted by the tenderer in above format, are also to be enclosed by the tenderer.

e. The OEM of the offered FM Mono and Stereo Modulation Monitor must have his local office/authorized representative/dealer in India for after sales support. **A certificate as per Annexure-I** duly signed by the OEM as well as local office/authorized representative/dealer must be submitted with the offer. Copy of Agreement/MoU executed between OEMs and their authorized representative/dealer duly signed by both must also be submitted with the offer.

SECTION-1.0

GENERAL SPECIFICATIONS:

1.0 FM Mono and Stereo Modulation Monitor including RF Amplifier equipment as per AIR specification shall be used for round the clock for continuous operation without any interruption in VHF FM broadcast service at AIR station for FM transmitter/studio setup**.** The offered equipment/items as per specification shall be field proven for satisfactory operation

1.1 Please refer tender documents for general term and conditions of contract for supply including all the commercial aspects like, Packing and Packing List, Insurance and Marine Risk etc., Payment terms, Penalty/Compensation for Delay, Damages and Liabilities, Time Period and Extension for Delay, Foreclosure of Contract due to Abandonment or Reduction in Scope of Supply, Cancellation of Contract in Full or Part, Recovery of Security Deposit, Performance Guarantee, Unsatisfactory Workmanship, Damages Incurred During transit, Tenderer Liable for Damages, Defects, Recovery of Compensation, Ensuring Payment and Amenities, Tenderer to Indemnify Government against Patent Rights, Release of Security Deposit, Safety Code, insurance from manufacturer's works/factory to respective site etc **i.e. in totality**.

1.2 INSPECTION:

1.2.1 Detailed Pre-dispatch Inspection (PDI) of FM Mono and Stereo Modulation Monitor will be carried out at OEM's Works by **two Engineers** of All India Radio as per details given in Section-3.0.

1.2.2 Call for Pre-dispatch Inspection (PDI) is to be given by the tenderer to All India Radio at least **8 weeks** in advance. Inspection period shall be based on one working day for three FM Mono and Stereo Modulation Monitor. Testing/measurements as per approved ATP must be submitted to All India Radio along with the call for PDI for analyzing etc.

1.2.3 For AIR inspecting engineers, expenses toward to and fro air journey, boarding, lodging etc. will be borne by All India Radio.

1.2.4 The complete Acceptance Test Procedure/Protocol (ATP) will be prepared by the OEM of the FM Mono and Stereo Modulation Monitor and submitted to DDG (E-FM), P&D Unit, DG: AIR for approval within 15 days of issue of Acceptance of Tender. ATP will also indicate full details of setup for measuring/testing equipments to be deployed during the performance measurements/inspection. The **approved ATP** shall form the basis for performance measurements/inspection to be carried out. AIR has the right to include other technical parameters in ATP submitted by OEM within the ambit of specification of the product offered.

1.3 INFORMATION/INFORMATION TO BE SUPPLIED WITH THE TENDER:

(i) The complete technical specifications (Section wise & Clause wise) compliance statement alongwith Schedule of Requirements/Materials (un-priced) duly signed & stamped by the respective Original Equipment Manufacturer (OEM) and countersigned by the tenderer as per the format given above in clause A (3), to assess the full merit of the offer, **without which the tender offer will be considered incomplete and is liable for rejection.**

(ii) Complete printed technical literature/data sheet/schematic drawings/detailed information including technical manual of FM Mono and Stereo Modulation Monitor and associated equipments/items as per Section-4.0 (I&II) from the Original Equipment Manufacturer (OEM) in support of compliance statement should be furnished for all the items of the tender, to assess the full merit of the offer, **without which the tender offer will be considered incomplete and is liable for rejection.**

(iii) Detailed Schedule of Requirements/Materials (un-priced) for supply of FM Mono and Stereo Modulation Monitor should be in conformity with Section-4.0 (I&II) without any change in the format, **failing which, the tender will be considered incomplete and is liable for rejection**. The tenderer must quote all items.

(iv) Descriptive information and complete details of each equipment offered shall be given by the tenderer.

(v) Country of Origin, Make, Type & Model of all the offered items should be mentioned including the name & address of their vendors.

(vi) A copy of the Technical Manual must be enclosed with technical bid for assessing the complete FM Mono and Stereo Modulation Monitor including RF Amplifier. The Technical Manual must include at least the details given below:

(a) General description of the offered FM Mono and Stereo Modulation Monitor including RF Amplifier, block diagram/schematic drawings etc.
(b) Diagrams showing the isometric view of FM Mono and Stereo Modulation Monitor including RF Amplifier equipment with dimensions in metres.
(c) Installation Manual & drawings with dimensions in respect of offered equipment.
(d) The procedure of settings FM Mono and Stereo Modulation Monitor including RF Amplifier should be described in detail with practical examples.
(e) Photograph of the FM Mono and Stereo Modulation Monitor including RF Amplifier showing Front, Rear, Side & Top view.
(f) **All *Do's and Don'ts* which are essential for safe Installation, Operation & Maintenance of the FM Mono and Stereo Modulation Monitor including RF Amplifier.**

1.4 DOCUMENTS/INFORMATION TO BE SUPPLIED BY THE TENDERER WITHIN 15 DAYS AFTER ISSUE OF ACCEPTANCE OF TENDER:

One set of Technical Manuals (for Installation, Testing, Commissioning, Operation, Maintenance & Servicing, including theory of operation and fault diagnosis) **COLOUR** printed and duly bound for FM Mono and Stereo Modulation Monitor along with soft copy on pen drive must be supplied to "DDG(E-FM), P & D Unit, DG: AIR, New Delhi-110001" **for examination & approval.**

1.5 INFORMATION TO PRECEDE DISPATCH OF EQUIPMENT:

Following information should be supplied to the DDG (E-FM), P & D Unit, DG:AIR and each of the consignee, two months prior to dispatch of Equipment:

a) Detailed list of equipment under dispatch.

1.6 INFORMATION TO BE SUPPLIED ALONGWITH EQUIPMENT:

Technical manuals (for Installation, testing, commissioning, Operation, Maintenance & Servicing, including theory of operation and fault diagnosis) **COLOUR** printed and duly bound for FM Modulation

Monitor and inspection report with soft copy on pen drive shall be supplied as per details given below: -

(i) For Consignee- 2 Sets of technical manual in hard copies printed and duly bound alongwith one soft copy on pen drive.

(ii) For the following Offices/Officers-One soft copy on pen drive for each offices/officers:
DDG(E-FM), DDG(E-TM), Zonal Office (Maintenance Wing of North zone), Zonal Office (Project Wing of North zone), Technical Library(P&D Unit), R&D & NABM (T)

1.7 GUARANTEE:

The tenderer shall submit with his tender an undertaking to accept the following guarantees:
{This Guarantee clause is applicable to all the equipments/items mentioned in Schedule of Requirements/Materials (un-priced)}.

(i) A guarantee that the equipment supplied will be in accordance with these specifications, varied only to the extent stated in his tender and agreed to in the contract.

(ii) A guarantee to make good within 15 days (from the date of first intimation to OEM/tenderer) at tenderer's expense any component which becomes defective under normal operating conditions, for **36 months** from the date of supply at D-6 Godown Delhi. If the tenderer failed to rectify the fault within the stipulated period of 15 days, the guarantee period for that particular location (site) would be extended corresponding to the outage period.

(iii) A guarantee to supply all components for a period of ten years from the date of acceptance of Equipment at site, at rates at which these are being supplied by him to other customers and also should match prices of original manufactures of these components prevailing at that time.

(iv) If at any stage during next 10 years, the manufacturer stops production of this model of Equipment, he shall intimate All India Radio in advance to enable the latter to stock the critical items.

1.8 LANGUAGE/UNITS:

All information supplied by the Tenderer & all markings, notes, designation on the drawings & associated write-ups shall be in "**English language"** only.

All dimensions, units on drawings, all references to weights, measures & quantities shall be in MKS.

1.9 DELIVERY OF EQUIPMENT:

Supply will have to be completed within **SEVEN MONTHS** from the date of Acceptance of Tender.

1.10 PACKING AND PACKING LISTS:

All the equipment should be securely and properly packed to withstand transit hazards. Equipment packing shall be fit for sea freight and incorporate adequate protection against ingress of moisture. Packing slips giving details of the items contained in each package shall be placed inside the package in a water proof envelop to enable easy identification and should contain cross references to item/part numbers of installation drawings/components lists. Copies of packing slips and other details should be sent separately to respective consignee and also to the DDG(E-FM), P & D Unit, DG: AIR, New Delhi.

1.11 INSURANCE AND MARINE RISKS ETC:

Please refer to commercial terms.

1.12 POWER SUPPLY FOR ALL EQUIPMENT:

(i)	Operating Line voltage	AC Single Phase, 230 Volts ± 10 %
(ii)	Frequency	50 Hz ± 4%
(iii)	Power factor	Better than 0.9.

1.13 ENVIRONMENTAL CONDITIONS FOR EQUIPMENT:

Outside temperature range : -30º C to + 40º C
Ambient temperature range for operation : 0º C to + 40º C
Relative humidity : 95 percent, non-condensing
Working altitude : Up to 4500 meters AMSL

The OEM of the equipment is required to submit supporting technical documentary proof along-with tender documents in order to confirm/verify that the offered equipment shall work without any de-gradation in the performance of the offered Equipment under above mentioned environmental conditions.

1.14 MAINTENANCE SUPPORT AND SPARES:

(a) The minimum recommended essential spares shall be quoted separately by the tenderer.
(b) The minimum recommended essential spares may be based on predicted rate of failure.
(c) In case, the tenderer quotes the optional items as 'a set', the details of the components/items offered in the 'set' must be spelt out clearly including their Make & Model and quantity.

1.15 LOCAL REPRESENTATIVE/DEALER:

(a) The OEM should have complete setup for maintenance/repair of the FM Mono and Stereo Modulation Monitor in India, either of its own or through local office/authorized representative/dealer.
(b) The local office/authorized representative/dealer will be the nodal point for resolving issues related to after sales support. It is the responsibility of local office/authorized representative/dealer to arrange the repair/replacement of faulty items. Any module of FM Mono and Stereo Modulation Monitor requiring repairs will be repaired at site. If it is not feasible to repair the module at site, the same will be collected from the site by local office/authorized representative/dealer that will arrange repairs locally. The cost of transportation, repairs etc. shall be borne by the tenderer during the guarantee period.

(c) After sales support for the repairs/maintenance of FM Mono and Stereo Modulation Monitor after the completion of guarantee period, shall also be provided by the OEM of the FM Mono and Stereo Modulation Monitor through their local office/authorized representative/dealer in India.
(d) The details of technical facilities available with local office/authorized representative/dealer **for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.**
(e) At the discretion of AIR, AIR representative(s) may visit the works of local office/authorized representative/dealer of OEM in India to ensure/verify that adequate technical infrastructure is available for after sales service for timely resolving the issues related to attending/replacing the equipments. Tenders from the tenderers who failed to meet these criteria shall be considered incomplete and is liable to be rejected.

SECTION-2.0

2.1 The FM Mono and Stereo Modulation Monitor should provide a complete solution for the analog portions of the FM signal. It should combine the features and functions of an RF Amplifier, FM Demodulator, Stereo Demodulator, RDS decoder, SCA decoder etc. in one stand-alone unit.

S. NO.	TECHNICAL PARAMETERS	TECHNICAL SPECIFICATIONS
2.2	**R.F. INPUT:**	
2.2.1	Frequency Range	88 MHz-108 MHz [To be tunable to any frequency in VHF FM band 88 MHz to 108 MHz]
2.2.2	Direct RF Input Range	1 to 5 Vrms, 50 Ω BNC Connector
2.2.3	Antenna Input	100 µV or better sensitivity, 75 Ω
2.2.4	Accuracy at all Modulation Levels	± 2.0 % or better
2.3	**BASEBAND MEASUREMENTS:**	
2.3.1	Modulation Frequency	30 Hz - 100 kHz
2.3.2	Frequency Deviation	± 75 kHz for 100% modulation.
2.3.3	Frequency Deviation Indication	0 to 133 %
2.3.4	Frequency Deviation Indication Accuracy	± 2.0 % or better
2.3.5	AM Noise Measurement	To measure AM noise down to 70 dB from 100% AM modulation.
2.4	**MPX Signal Output:**	
2.4.1	Frequency Response	Better than ± 0.25 dB
2.4.2	Total Harmonic Distortion plus Noise (THD+N)	Not more than 0.01%
2.4.3	IMD (SMPTE) (60 Hz/7 kHz, 4:1)	Not more than 0.02%
2.4.4	SNR	≥ 90 dB
2.5	**STEREO MEASUREMENTS:**	
	It should have 2 modulation meters for simultaneous monitoring of L & R channels, total modulation and measurements of channel separation, crosstalk, S.C. suppression, noise and pilot etc.	
2.5.1	Channel Separation (L/R or R/L) (30 Hz to 15 kHz)	Better than 70 dB
2.5.2	Crosstalk (L+R) to (L-R) or (L-R) to (L+R)	Better than 65 dB

2.5.3	Pilot Carrier Measurement	0 % to 15 % injection
2.6	**OUTPUT:**	
2.6.1	Level (L & R)	≥ 0 dBm, 600 Ω, balanced
2.6.2	Frequency Response	Better than ± 0.25 dB
2.6.3	De-emphasis	Flat, 50µsec.
2.6.4	Signal to Noise Ratio	≥ 85 dB
2.6.5	Total Harmonic Distortion plus Noise (THD+N)	Not more than 0.01%
2.6.6	Inter Modulation Distortion (SMPTE) (60 Hz/7 kHz, 4:1)	Not more than 0.02%
2.7	**POWER REQUIREMENTS**	Single Phase as per Section-I
2.8	**GENERAL REQUIREMENTS:**	
2.8.1	Instrument should be suitable for mounting in a standard 19″ rack.	
2.8.2	All RF input and power input cords with suitable connectors are to be provided.	
2.8.3	All accessories needed for various measurements to be quoted.	
2.8.4	The Mod. Monitor should have front panel display for visual monitoring and real time level monitoring of various Parameters such as Deviation & Peak deviation, Carrier level, L&R Audio, L+R, L-R, Pilot injection, RDS/SCA etc. The Mod. Monitor should be capable for remote monitoring of above parameters via TCP/IP and should be SNMP compliant.	
2.9	**ENVIRONMENTAL CONDITIONS** (As per Section -I)	

SECTION 3.0

INSPECTION DETAILS

The inspection for acceptance of the FM Mono and Stereo Modulation Monitor including RF Amplifier will be carried out at the Works of OEM by Engineers of All India Radio (AIR) in accordance with Acceptance Test Procedure/Protocol (ATP). All facilities like complete set of measuring instruments, power supply, manual assistance etc. will be provided by the Manufacturer. Complete details and specifications of the FM Mono and Stereo Modulation Monitor including RF Amplifier will be checked and all parameter values will be measured.

Testing/measurements including Operational & functional checking of the FM Mono and Stereo Modulation Monitor including RF Amplifier and measurements will be carried out as per approved ATP.

It is mandatory that all these Testing/measurements including Operational & functional checking of all the FM Mono and Stereo Modulation Monitor including RF Amplifier and measurements are carried out well in advance and these measurement details, graphical printouts and figures must be available, at the time of inspection. These must also be submitted to All India Radio along with the call for inspection of the FM Mono and Stereo Modulation Monitor including RF Amplifier well in advance for analyzing etc.

Following information should also form part of above data which will also be checked for each FM Mono and Stereo Modulation Monitor including RF Amplifier during inspection by AIR representative:

1. Make, Type, Model and Country of Origin of the FM Mono and Stereo Modulation Monitor including RF Amplifier, accessories and spares.
2. Measurements of all parameters as per Section-2.0 of Technical Specifications. All the parameters will be measured.

SECTION-4.0 (I)

SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) (FOR SUPPLY OF ONE SET OF STEREO FM DIGITAL AUDIO BROADCAST PROCESSOR)

S. No.	Description	Make	Model	Unit	Qty.
1.0	Supply of FM Mono and Stereo Modulation Monitor equipment complete with all accessories including technical manuals as per AIR specification.			Set complete	1 Set complete
2.0	Supply of any other items/accessories offered for the completeness of the system (Items wise details of offered and included material with part numbers, if any are to be given by the tenderer) **State NA, if not applicable**			Lot	1 Lot
3.0	Inspection charges of FM Mono and Stereo Modulation Monitor as per AIR specifications			Lot	1 Lot

SECTION-4.0 (II)

SPARE (OPTIONAL) SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) (FOR ONE SET OF STEREO FM DIGITAL AUDIO BROADCAST PROCESSOR)

S. No.	Description	Make	Model	Unit	Qty.
1.0	Supply of FM Mono and Stereo Modulation Monitor equipment complete with all accessories as per AIR specification.			Set complete	1 Set complete
2.0	Supply of recommended spares (Items wise details of offered with part numbers, if any are to be given by the tenderer)			Lot	1 Lot

All India Radio at its own discretion may procure spares for a value not exceeding 10% of the cost of equipments. The tenderer should quote all the essential spares.

ANNEXURE-I

PERFORMA FOR INFORMATION ABOUT LOCAL OFFICE /AUTHORIZED REPRESENTATIVE/ DEALER IN INDIA FOR AFTER SALES SUPPORT

1.	Address of local office/authorized representative/ Dealer	
	Telephone (Landline) No.	
	Mobile No.	
	E-mail Address	
2.	Address for communication (if different)	
3.	Legal Status (local office/authorized representative/dealer)	
4.	Name, contact number (Mobile number) & e-mail address of official representative of the local office/authorized representative/dealer	
5.	Brief details of Technical facilities available for after sales support: The details of technical facilities available with local office/authorized representative/dealer for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.	
6.	Main line of business, specialization and number of years of operation	
7.	Total number of permanent technical employees including their designation and qualification	
8.	Details of Agreement/MoU for after sales support with OEM (Copy must be provided with the offer)	Date of Agreement: Executed at : Executed by
(Authorized Signatory of local office/authorized representative/dealer) Name : Signature:		**(Authorized Signatory of Modulation Monitor OEM)** Name : Signature:

ANNEXURE-II

List of places (to be supplied at D-6 Godown, New Delhi)

PRASAR BHARATI
(*India's Public service Broadcaster***)**
DIRECTORATE GENERAL: ALL INDIA RADIO
(PLANNING & DEVELOPMENT UNIT)
*****

SPECIFICATION FOR SUPPLY OF RF COAXIAL FOAM TYPE CABLE -*5 Nos.*

CONTENTS:

A. ESSENTIAL REQUIREMENTS OF TENDER:

1. (i) The tenderer should submit Schedule of Requirements/Materials of Supply **without *price* *in the same format as given in Section-4.0 (I & II)*** of AIR Specifications in the technical bid, failing which the tender shall be considered incomplete and is liable to be rejected.

   (ii) It is also mandatory to mention ***Make & Model of the offered equipment/items*** in the Schedule of Requirements/Materials of Supply, failing which the tender shall be considered incomplete and is liable to be rejected.

   (iii) Make/Model and detailed specifications of the equipment/items being offered shall be mentioned categorically, to access the full merit of the offer, failing which tender shall be considered incomplete and is liable to be rejected. **Broader terms viz. Equivalent/similar will not be accepted.**

2. Each statement of this specifications has to be complied with & supported by printed technical literature, technical data sheets, schematic drawings and technical manuals from the manufacturer of the equipment by the tenderer, to assess the full merit of the offer without which tender will be considered incomplete and is liable to be rejected.

3. The tenderer should submit the tender offer to AIR in the format given below, section wise & clause wise, in respect of all the sections of technical specifications. The OEM/tenderer must provide the page number reference, in column (4) of the table given below, of the technical bid clearly indicating the volume number also, if any, for each supporting document to verify the parametric values shown in the compliance statement, to assess the full merit of the offer, failing which the tender shall be considered incomplete and is liable to be rejected.

S. No. of AIR Specifications (Section wise & Clause wise) (1)	Details of AIR Specifications (Part/ Section wise & Clause wise) (2)	Compliance **(Yes/No)** (3)	The page no. of the tender offer, where the information/ supporting document is available. (4)	Remarks (5)
A. Essential requirement for tender				
B. Essential eligibility criteria for tenderers				
Section-1 Clause wise				
Section-2 Clause wise				
Section-3 Clause wise				
Section-4 Clause wise				

4. The tenderer should quote the rate/cost of individual items in the tender offer while submitting the tender offer for spares **(OPTIONAL)** in commercial bid. ***Optional items will not be considered for ranking purpose.***

5. The complete technical specifications (Section wise & Clause wise) compliance statements along with Schedule of Requirements/Materials (un-priced) must be signed & stamped by the respective Original Equipment Manufacturer (OEM) in the tender document, failing which the tender shall be considered incomplete and is liable to be rejected.
   In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp the complete Technical specifications (Section wise & Clause wise) compliance statements, failing which the tender shall be considered incomplete and is liable to be rejected. The OEM & tenderer should mention their name & designation of the signatories with full address, phone number, e-mail addresses etc.

6. The authorization and guarantee must be given by respective Original Equipment Manufacturer (OEM) on their letter head pad duly signed & stamped. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also give guarantee on their letter head pad duly signed & stamped, failing which the tender shall be considered incomplete and is liable to be rejected. Guarantee shall be as per the format given in AIR specification.

7. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer should also furnish a certificate from the OEM that the tenderer can quote items of the OEM directly, failing which the tender shall be considered incomplete and is liable to be rejected without any notice/back reference.

8. Any change in the AIR technical specifications format or language or in parameters or of any other nature including the deletion/addition of technical specifications clause, words, lines in the technical specifications compliance statement by the OEM/ tenderer will not be acceptable to AIR and the tender is liable to be rejected.

9. Prasar Bharati will follow the reciprocal market access strategy of the Government of India, which describes on the Clause 10(d) of Public Procurement Preference to Make in India, Order 2017. The Purchaser shall have right for not consider any Bid and may restrict such Bidders from the bidding process; who originate from those countries, where they do not allow market access for Indian

companies; in such cases, the Clause 10 (d) of Public Procurement Preference to Make in India, order 2017, shall be invoked wherever applicable, when it is relevant.

10. Amendment in General Financial Rules (GFRs), 2017-Golobal Tender Enquiry issued vide F. No. 12/17/2019-PPD dated 15.05.2020 of Government of India, Ministry of Finance, Department of Expenditure, Public Procurement Division shall be applicable.

B. <u>ESSENTIAL ELIGIBILITY CRITERIA FOR TENDERERS:</u>

a. The tenderer shall be from India only.

b. The tenderer should either be the OEM of RF Coaxial foam type Cable or their authorized representative/dealer.

c. In case the tenderer is the authorized representative/dealer, the tenderer must be an authorized representative/dealer of any OEM of RF Coaxial foam/air dielectric type Cable for last three years or more **OR** must be in the business of sales and supply of RF Coaxial foam/air dielectric type Cable for last three years or more. Documentary evidence to support this must be provided.

d. (i) The OEM of the RF Coaxial foam type Cable must have an experience of manufacturing and supplying RF Coaxial foam type Cable of not less than 12 kW average power rating (@ 108 MHz, VSWR 1.0, ambient temperature 40°C) for at least last **7 years**. Documentary evidence to support this must be provided.

(ii) The OEM should have supplied RF Coaxial foam/air dielectric type Cable to reputed/public broadcasters. The OEM must provide the details of past supply record **(in the format given below)** for such offered RF Coaxial foam/air dielectric type Cable of length in total not less than 1000m, supplied during last **5 years** ending last day of the month previous to the one in which the tender is invited.

Supply Order No. with date	Type & Model of the supplied RF Coaxial foam/air dielectric type Cable	Quantity/Length	Name of the broadcaster with full postal address including e-mail address to whom RF Coaxial foam/air dielectric type Cable was supplied.	Remarks
(1)	(2)	(3)	(4)	(5)

(iii) All India Radio reserves the right to get performance feedback of the RF Coaxial Cable from any of the above broadcasters named by the tenderer/OEM.

(iv) Copies of supply order/completion certificates/delivery challans/invoice of RF Coaxial foam/air dielectric type Cable of length in total not less than 500m out of the 1000m submitted by the tenderer in above format, are also to be enclosed by the tenderer.

e. The OEM of the offered RF Coaxial foam type Cable must have his local office/authorized representative/dealer in India for after sales support. **A certificate as per Annexure-I** duly signed by the OEM as well as local office/authorized representative/dealer must be submitted with the offer. Copy of Agreement/MoU executed between OEMs and their authorized representative/dealer duly signed by both must also be submitted with the offer.

SECTION - 1.0

GENERAL SPECIFICATIONS:

1.0 RF Coaxial Foam type Cable & accessories as per AIR specification shall be used round the clock for continuous operation without any interruption in VHF FM broadcast service at AIR station.

1.1 Please refer tender documents for general terms and conditions of contract for supply including all the commercial aspects like; Packing and packing list, Insurance and Marine Risk etc. Payment terms, Penalty/Compensation for delay, Damages and liabilities, Time Period and Extension for Delay, Foreclosure of contract due to Abandonment or Reduction in scope of supply, Cancellation of contract in full or part, Recovery of security deposit, Performance Guarantee, Unsatisfactory workmanship, Damages incurred during transit, tenderer liable for damages, Defects, Recovery of compensation, Ensuring payment and amenities, tenderer to indemnify Government against Patent Rights, Release of security deposit, Safety Code, insurance from manufacturer's works/factory to respective site etc. **i.e. in totality**.

1.2 INSPECTION:

a. RF Coaxial Foam type Cable & accessories will be accepted on the basis of OEM's test certificates (as per AIR specifications) duly stamped and signed by respective OEM on their letterhead, failing which test certificates will be considered incomplete and equipment offered by the firm is liable to be rejected.

b. The complete Acceptance Test Procedure/Protocol (ATP) will be prepared by the respective OEM of the equipment/items as per Section-4.0 (A&B) and submitted to DDG (E-FM), P&D Unit, DG: AIR for approval within 15 days of issue of Acceptance of Tender. The **approved ATP** shall form the basis for test certificate of actual performance measurements/inspection to be carried out by OEM. AIR has the right to include other technical parameters in ATP submitted by OEM within the ambit of specification of the product offered.

1.3 INFORMATION TO BE SUPPLIED WITH THE TENDER:

(i) The complete technical specifications (Section wise & Clause wise) compliance statement alongwith Schedule of Requirements/Materials (un-priced) duly signed & stamped by the respective Original Equipment Manufacturer (OEM) and countersigned by the tenderer as per the format given above in clause A (4).

(ii) Complete printed technical literature/technical data sheet/schematic drawings/detailed information including Technical Manual of RF Coaxial Foam type Cable & accessories as per Section-4.0 (A&B), by the respective Original Equipment Manufacturer of the offered equipment/items & countersigned by the tenderer in support of compliance statement should be furnished, to assess the full merit of the offer, without which the tender offer will be considered incomplete and is liable for rejection.

(iii) Detailed Schedule of Requirements/Materials (un-priced) for the supply of RF Coaxial Foam type Cable & accessories should be in conformity with Section-4.0 (A&B) without any change in the format, failing which, the tender will be considered incomplete and is liable for rejection. The tenderer must quote all items.

(iv) Descriptive information and complete details of each equipment/items offered shall be given by the tenderer.

(v) Country of Origin, Make, Type & Model of all the offered items should be mentioned including the name & address of their vendors.

(vi) The performance figures of the offered equipment/items must be given by the tenderer, to assess the merit of the offer without which the tender will be considered incomplete and is liable to be rejected.

1.4 INFORMATION TO BE SUPPLIED BY THE TENDERER WITHIN 15 DAYS AFTER ISSUE OF ACCEPTANCE OF TENDER:

One set of Technical Manuals (for Installation, Testing, Commissioning, Operation & Maintenance, including theory of operation and fault diagnosis) **COLOUR** printed and duly bound for RF Coaxial Foam type Cable & accessories alongwith soft copy on CD must be supplied to "DDG (E-FM), P & D Unit, DG: AIR, New Delhi-110001", for examination & approval.

1.5 INFORMATION TO PRECEDE DISPATCH OF EQUIPMENT:

Following information should be supplied to the DDG (E-FM), P & D Unit, DG:AIR and each of the consignee, two months prior to dispatch of Equipment:

a) Detailed list of equipment under dispatch.

b) Photograph showing location of various units/sub units with item numbers marked thereon.

1.6 INFORMATION TO BE SUPPLIED ALONGWITH EQUIPMENT:

Technical manuals (for Installation, testing, commissioning, Operation, Maintenance & Servicing, including theory of operation and fault diagnosis) **COLOUR** printed and duly bound for RF Coaxial Cable with soft copy on pen drive shall be supplied as per details given below: -

(i) For Consignee- 2 Sets of technical manual in hard copies printed and duly bound alongwith one soft copy on pen drive.

(ii) For the following Offices/Officers-One soft copy on pen drive for each offices/officers: DDG(E-FM), DDG(E-TM), Zonal Office (Maintenance Wing of North zone), Zonal Office (Project Wing of North zone), Technical Library(P&D Unit), R&D & NABM (T)

The tenderer is required to supply Technical Manual free of cost.

1.7 GUARANTEE:

The tenderer shall submit with his tender an undertaking to accept the following guarantees:

{This Guarantee clause is applicable to all the equipments/items mentioned in Schedule of Requirements/Materials (un-priced)}.

(i) A guarantee that the equipment supplied will be in accordance with these specifications, varied only to the extent stated in his tender and agreed to in the contract.

(ii) A guarantee to make good within 15 days (from the date of first intimation to OEM/tenderer) at tenderer's expense any component which becomes defective under normal operating conditions, for **36 months** from the date of supply at D-6 Godown Delhi. If the tenderer failed to rectify the fault within the stipulated period of 15 days, the guarantee period for that particular location (site) would be extended corresponding to the outage period.

(iii) A guarantee to supply all components for a period of ten years from the date of acceptance of Equipment at site, at rates at which these are being supplied by him to other customers and also should match prices of original manufactures of these components prevailing at that time.

(iv) If at any stage during next 10 years, the manufacturer stops production of this model of Equipment/items, he shall intimate All India Radio in advance to enable the latter to stock the critical items.

1.8 LANGUAGE/UNITS:

All information supplied by the tenderer & all markings, notes, designation on the drawings & associated write-ups shall be in "**English language"** only.

All dimensions, units on drawings, all references to weights, measures & quantities shall be in SI Units.

1.9 DELIVERY OF EQUIPMENT:

Five (5) months from the date of issue of Acceptance of Tender.

1.10 PACKING AND PACKING LISTS:

All the equipment should be securely and properly packed to withstand transit hazards. Equipment packing shall be fit for sea freight and incorporate adequate protection against ingress of moisture. Packing slips giving details of the items contained in each package shall be placed inside the package in a water proof envelop to enable easy identification and should contain cross references to item/part numbers of installation drawings/components lists. Copies of packing slips and other details should be sent separately to respective consignee and also to the Dy. Director General (E-FM), P & D Unit, DG: AIR, New Delhi.

1.11 INSURANCE AND MARINE RISKS ETC:

Please refer to commercial terms.

1.12 MAINTENANCE SUPPORT AND SPARES:

(a) The minimum recommended essential spares shall be quoted separately by the tenderer.
(b) The minimum recommended essential spares may be based on predicted rate of failure.
(c) In case, the tenderer quotes the optional items as 'a Set', the details of the components/items offered in the 'Set' must be spelt out clearly including their Make & Model and quantity.

1.13 LOCAL REPRESENTATIVE/DEALER:

(a) The OEM should have complete setup for maintenance/repair of the RF Coaxial foam type Cable in India, either of its own or through local office/authorized representative/dealer.
(b) The local office/authorized representative/dealer will be the nodal point for resolving issues related to after sales support. It is the responsibility of local office/authorized representative/dealer to arrange the repair/replacement of faulty items. Any module/accessories of RF Coaxial foam type Cable requiring repairs will be repaired at site. If it is not feasible to repair the module/accessories at site, the same will be collected from the site by local office/authorized representative/dealer that will arrange repairs locally. The cost of transportation, repairs etc. shall be borne by the tenderer during the guarantee period.
(c) After sales support for the repairs/maintenance of RF Coaxial foam type Cable after the completion of guarantee period, shall also be provided by the OEM of the RF Coaxial foam type Cable through their local office/authorized representative/dealer in India.
(d) The details of technical facilities available with local office/authorized representative/dealer **for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.**
(e) At the discretion of AIR, AIR representative(s) may visit the works of local office/authorized representative/dealer of OEM in India to ensure/verify that adequate technical infrastructure is available for after sales service for timely resolving the issues related to attending/replacing the equipment/items. Tenders from the tenderers who failed to meet these criteria shall be considered incomplete and are liable to be rejected.

1.14 ENVIRONMENTAL CONDITIONS FOR EQUIPMENT:

Outside temperature range	:	-30º C to + 40º C
Ambient temperature range for operation	:	0º C to + 40º C
Relative humidity	:	95 percent, non-condensing
Working altitude	:	Up to 4500 meters AMSL

The OEM of the RF Coaxial Cable is required to submit supporting technical documentary proof along-with tender documents in order to confirm/verify that the offered RF Cable shall work without any de-gradation in the performance of the offered RF Cable under above mentioned environmental conditions.

SECTION-2.0

TECHNICAL SPECIFICATIONS:

2.1. RF COAXIAL FOAM TYPE CABLES & ACCESSORIES

S. No.	Technical parameter	Technical specification
1.	Size	*1-5/8"*
2.	Average Power Rating of RF Coaxial foam type Cable at standard conditions VSWR 1.0, ambient temperature 40º C (@ 108 MHz)	≥ 12 kW
3.	Attenuation of each RF Coaxial foam type Cable at standard conditions VSWR 1.0, ambient temperature 20º C (@ 108 MHz in dB/100 M)	≤ 0.70
4.	Frequency Range	88 MHz-108 MHz
5.	Impedance	50 Ohm ± 1 Ohm

The RF Coaxial foam type Cable shall be as per AIR Specification, failing which, tender will be considered incomplete and is liable to be rejected. The RF Coaxial foam type Cable shall be supplied with 1-5/8" EIA flange fitted at both end of the cable with Bullets (inners) for 1-5/8" Flange Connectors complete for each places.

All following accessories associated with RF Coaxial foam type Cables are to be provided:

(i) Hoisting stockings
(ii) Earthing kits
(iii) Wall gland
(iv) Cable Clamps (adjustable height) with nut, bolt & washer and associated accessories as per cable manufacturer's recommendations.
(v) Any other accessories offered for the completeness of the system (Item wise details & part No., if any, of the offered and included materials are to be given by the tenderer)

SECTION-3.0

INSPECTION:

RF Coaxial foam type Cables & accessories will be accepted on the basis of OEM's test certificate of actual performance measurements as per AIR specification before dispatch to All India Radio and receipt of equipments/items at site in good condition.

The Original Equipment Manufacturer's (OEM) test certificates shall be duly signed & stamped on the letter head of the OEM, failing which Original Equipment Manufacturer's (OEM) test certificates will be considered incomplete and equipment offered by the tenderer is liable to be rejected.

Following information should also form part of OEM test certificate for each RF Coaxial foam type Cables & accessories.

1. Make, Type, Model and Country of Origin of the accessories and spares.
2. Measurements of all parameters as per Section 2.0 of Technical Specification.

SECTION-4.0 (A)

SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) [FOR EACH SITE]

S. No.	Description	Make	Model	Qty.
4.1	i) Supply of 1-5/8" RF Coaxial foam type Cable as per AIR Specification			*50 Meters
	ii) 1-5/8" EIA flange Connector fitted at both end of the above cable			2 Nos.
	iii) Bullets (inners) for 1-5/8" Flange Connectors			2 Nos.
4.1.1	Hoisting stockings for each cable as per recommendation of manufacturer			1 Set
4.1.2	Earthing kits for RF Coaxial foam type Cable			2 Nos.
4.1.3	Wall gland/ feed through assembly with accessories for RF Coaxial foam type Cable			2 Nos.
4.1.4	Cable Clamps (adjustable height) with nut, bolt & washer			15 Nos.
4.2	Any other items/hardware materials etc. offered for the completeness of the above System. (Item wise details & Part No., if any, of the offered items/hardware materials etc. shall be given by the tenderer)			1 Lot

SECTION-4.0 (B)

SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) (OPTIONAL ITEMS) (Not to be considered for Ranking)
{The tenderer must quote all items}

S. No.	Description	Make	Model	Qty.
4.3	1-5/8" EIA flange Connector		Set	1 Set
4.4	Bullets (inners) for 1-5/8" Flange Connectors		Set	1 Set

For ranking purpose only. The RF Coaxial foam type Cable length may be considered as tentative.

ANNEXURE-I

PERFORMA FOR INFORMATION ABOUT LOCAL OFFICE /AUTHORIZED REPRESENTATIVE/ DEALER IN INDIA FOR AFTER SALES SUPPORT

1.	Address of local office/authorized representative/ Dealer	
	Telephone (Landline) No.	
	Mobile No.	
	E-mail Address	
2.	Address for communication (if different)	
3.	Legal Status (local office/authorized representative/dealer)	
4.	Name, contact number (Mobile number) & e-mail address of official representative of the local office/authorized representative/dealer	
5.	Brief details of Technical facilities available for after sales support: The details of technical facilities available with local office/authorized representative/dealer for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.	
6.	Main line of business, specialization and number of years of operation	
7.	Total number of permanent technical employees including their designation and qualification	
8.	Details of Agreement/MoU for after sales support with OEM (Copy must be provided with the offer)	Date of Agreement: Executed at : Executed by
(Authorized Signatory of local office/authorized representative/dealer) Name : Signature:		**(Authorized Signatory of RF Coaxial Cable OEM)** Name : Signature:

ANNEXURE-II

List of places (to be supplied at D-6 Godown, New Delhi)

PRASAR BHARATI
(*India's Public Service Broadcaster***)**
DIRECTORATE GENERAL: ALL INDIA RADIO
(PLANNING & DEVELOPMENT UNIT)
*****

SPECIFICATION FOR SUPPLY OF 2-BAY VERTICALLY POLARIZED SIDE MOUNT (POLE TYPE) VHF FM ANTENNA -*5 Nos.*

CONTENTS

A. ESSENTIAL REQUIREMENTS FOR THE TENDER:

1. (i) The tenderer should submit Schedule of Requirements/Materials of Supply **without *price* *in the same format as given in Section-4.0 (I & II)*** of AIR Specifications in the technical bid, failing which the tender shall be considered incomplete and is liable to be rejected.

   (ii) It is also mandatory to mention ***Make & Model of the offered equipment*** in the Schedule of Requirements/Materials of Supply, failing which the tender shall be considered incomplete and is liable to be rejected.

   (iii) Make/Model and detailed specifications of the equipments/items being offered shall be mentioned categorically, to access the full merit of the offer, failing which tender shall be considered incomplete and is liable to be rejected. **Broader terms viz. Equivalent/similar will not be accepted.**

2. Each statement of this specifications has to be complied with & supported by printed technical literature, technical data sheets, schematic drawings and technical manuals from the manufacturer of the equipment by the tenderer, to assess the full merit of the offer without which tender will be considered incomplete and is liable to be rejected.

3. The tenderer should submit the tender offer to AIR in the format given below, section wise & clause wise, in respect of all the sections of technical specifications. The OEM/tenderer must provide the page number reference, in column (4) of the table given below, of the technical bid clearly indicating the volume number also, if any, for each supporting document to verify the parametric values shown in the compliance statement, to assess the full merit of the offer, failing which the tender shall be considered incomplete and is liable to be rejected.

S. No. of AIR Specifications (Section wise & Clause wise) (1)	Details of AIR Specifications (Part/ Section wise & Clause wise) (2)	Compliance **(Yes/No)** (3)	The page no. of the tender offer, where the information/ supporting document is available. (4)	Remarks (5)
A. Essential requirements for tender				
B. Essential eligibility criteria for tenderers				
Section-1 Clause wise				
Section-2 Clause wise				
Section-3 Clause wise				
Section-4 Clause wise				

4. The tenderer should quote the rate/cost of individual items in the tender offer while submitting the tender offer for spares **(OPTIONAL)** in commercial bid. ***Optional items will not be considered for ranking purpose.***

5. The complete technical specifications (Section wise & Clause wise) compliance statements along with Schedule of Requirements/Materials (un-priced) must be signed & stamped by the respective Original Equipment Manufacturer (OEM) in the tender document, failing which the tender shall be considered incomplete and is liable to be rejected.
   In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also sign & stamp the complete Technical specifications (Section wise & Clause wise) compliance statements, failing which the tender shall be considered incomplete and is liable to be rejected. The OEM & tenderer should mention their name & designation of the signatories with full address, phone number, e-mail addresses etc.

6. The authorization and guarantee must be given by respective Original Equipment Manufacturer (OEM) on their letter head pad duly signed & stamped. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer must also give guarantee on their letter head pad duly signed & stamped, failing which the tender shall be considered incomplete and is liable to be rejected. Guarantee shall be as per the format given in AIR specification.

7. In case tender offer is from other than the Original Equipment Manufacturer, the tenderer should also furnish a certificate from the OEM that the tenderer can quote items of the OEM directly, failing which the tender shall be considered incomplete and is liable to be rejected without any notice/back reference.

8. Any change in the AIR technical specifications format or language or in parameters or of any other nature including the deletion/addition of technical specifications clause, words, lines in the technical specifications compliance statement by the OEM/ tenderer will not be acceptable to AIR and the tender is liable to be rejected.

9. Prasar Bharati will follow the reciprocal market access strategy of the Government of India, which describes on the Clause 10(d) of Public Procurement Preference to Make in India, Order 2017. The Purchaser shall have right for not consider any Bid and may restrict such Bidders from the bidding process; who originate from those countries, where they do not allow market access for Indian companies; in such cases, the Clause 10 (d) of Public Procurement Preference to Make in India, order 2017, shall be invoked wherever applicable,

when it is relevant.

10. Amendment in General Financial Rules (GFRs), 2017-Golobal Tender Enquiry issued vide F. No. 12/17/2019-PPD dated 15.05.2020 of Government of India, Ministry of Finance, Department of Expenditure, Public Procurement Division shall be applicable.

B. <u>ESSENTIAL ELIGIBILITY CRITERIA FOR TENDERERS:</u>

a. The tenderer shall be from India only.

b. The tenderer should either be the OEM of VHF FM Antenna or their authorized representative/dealer.

c. In case the tenderer is the authorized representative/dealer, the tenderer must be an authorized representative/dealer of any OEM of VHF FM Antenna for last three years or more **OR** must be in the business of sales and supply of VHF FM Antenna last three years or more. Documentary evidence to support this must be provided.

d.(i) The OEM of the VHF FM Antenna must have an experience of manufacturing and supplying 2-Bay VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna for at least last 7 years. Documentary evidence to support this must be provided.

(ii) The OEM should have supplied 2-Bay or more VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna to reputed/public broadcasters. The OEM must provide the details of past supply record (**in the format given below)** for at least 10 Nos. of such offered VHF FM Antenna, supplied during last 7 years ending last day of the month previous to the one in which the tender is invited.

Supply Order No. with date	Type & Model of the supplied VHF FM Antenna	Qty.	Name of the broadcaster with full postal address including e-mail address to whom VHF FM Antenna was supplied.	Remarks
(1)	(2)	(3)	(4)	(5)

(iii) All India Radio reserves the right to get performance feedback of the VHF FM Antenna from any of the above broadcasters named by the tenderer/OEM.

(iv) Copies of supply order/completion certificates/delivery challans/invoice of at least 05 Nos., out of the 10 Nos. of VHF FM Antenna submitted by the tenderer in above format, are also to be enclosed by the tenderer.

e. The OEM of the offered VHF FM Antenna must have his local office/authorized representative/dealer in India for after sales support. **A certificate as per Annexure-I** duly signed by the OEM as well as local office/authorized representative/dealer must be submitted with the offer. Copy of Agreement/MoU executed between OEMs and their authorized representative/dealer duly signed by both must also be submitted with the offer.

SECTION-I

GENERAL SPECIFICATIONS:

1.0 The 2-Bay VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna as per AIR specification shall be used for round the clock for continuous operation without any interruption in VHF FM broadcast service at AIR station for FM transmitter/studio setup. The offered equipment/items as per specification shall be field proven for satisfactory operation.

1.1 Please refer tender documents for general terms and conditions of contract for supply including all the commercial aspects like, Packing and packing list, Insurance and Marine Risk etc. Payment terms, Penalty/Compensation for delay, Damages and liabilities, Time Period and Extension for Delay, Foreclosure of contract due to Abandonment or Reduction in scope of supply, Cancellation of contract in full or part, Recovery of security deposit, Performance Guarantee, Unsatisfactory workmanship, Damages incurred during transit, tenderer liable for damages, Defects, Recovery of compensation, Ensuring payment and amenities, tenderer to indemnify Government against Patent Rights, Release of security deposit, Safety Code, insurance from manufacturer's works/factory to respective site etc. **i.e. in totality**.

1.2 INSPECTION:

a. 2-Bay VHF FM Antenna & accessories will be accepted on the basis of OEM's test certificates (as per AIR specifications) duly stamped and signed by respective OEM on their letterhead, failing which test certificates will be considered incomplete and equipment offered by the firm is liable to be rejected.

b. The complete Acceptance Test Procedure/Protocol (ATP) will be prepared by the respective OEM of the equipment/items as per Section-IV (A&B) and submitted to DDG (E-FM), P&D Unit, DG: AIR for approval within 15 days of issue of Acceptance of Tender. The **approved ATP** shall form the basis for test certificate of actual performance measurements/inspection to be carried out by OEM. AIR has the right to include other technical parameters in ATP submitted by OEM within the ambit of specification of the product offered.

1.3 INFORMATION TO BE SUPPLIED WITH THE TENDER:

(i) The complete technical specifications (Section wise & Clause wise) compliance statement alongwith Schedule of Requirements/Materials (un-priced) duly signed & stamped by the respective Original Equipment Manufacturer (OEM) and countersigned by the tenderer as per the format given above in clause A (3), to assess the full merit of the offer, **without which the tender offer will be considered incomplete and is liable for rejection.**

(ii) Complete printed technical literature/data sheet/schematic drawings/detailed information including technical manual of 2-Bay VHF FM Antenna from the Original Equipment Manufacturer (OEM) in support of compliance statement should be furnished for all the items of the tender, to assess the full merit of the offer, **without which the tender offer will be considered incomplete and is liable for rejection.**

(iii) Detailed Schedule of Requirements/Materials (un-priced) for supply of 2-Bay VHF FM Antenna should

be in conformity with Section-IV (A&B) without any change in the format, **failing which, the tender will be considered incomplete and is liable for rejection**. The tenderer must quote all items.

(iv) Descriptive information and complete details of each equipment offered shall be given by the tenderer.

(v) Country of Origin, Make, Type & Model of all the offered items should be mentioned including the name & address of their vendors.

(vi) A copy of the Technical Manual must be enclosed with technical bid for assessing the complete 2-Bay VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna. The Technical Manual must include at least the details given below:

(a) General description of the offered 2-Bay VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna, block diagram/schematic drawings etc.
(b) A suggestive drawing with dimensions in metres for installation of the 2-Bay VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna system with all allied equipment.
(c) Diagrams showing the isometric view of 2-Bay VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna and allied equipment with dimensions in metres.
(d) Installation Manual & drawings with dimensions in respect of offered equipment.
(e) Photograph of the 2-Bay VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna.
(f) **All *Do's and Don'ts* which are essential for safe Installation, Operation & Maintenance of the** 2-Bay VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna**.**

1.4 INFORMATION TO BE SUPPLIED BY THE TENDERER WITHIN 15 DAYS AFTER ISSUE OF ACCEPTANCE OF TENDER:

One set of Technical Manuals (for Installation, Testing, Commissioning, Operation & Maintenance, including theory of operation and fault diagnosis) **COLOUR** printed and duly bound for 2-Bay VERTICALLY Polarized Side Mount (Pole Type) VHF FM Antenna along with associated equipment, items & accessories along with soft copy on CD must be supplied to "Dy. Director General (Engg.) (FM), P & D Unit, DG: AIR, New Delhi-110001", for examination & approval.

1.5 INFORMATION TO PRECEDE DESPATCH OF EQUIPMENT:

Following information should be supplied to the Dy. Director General (Engg.) (FM), P & D Unit, DG:AIR and each of the consignee, two months prior to dispatch of Equipment:

a) Detailed list of equipment under dispatch.

b) Photograph showing location of various units/subunits with item numbers marked thereon.

1.6 INFORMATION TO BE SUPPLIED ALONGWITH EQUIPMENT:

Technical manuals (for Installation, testing, commissioning, Operation, Maintenance & Servicing, including theory of operation and fault diagnosis) **COLOUR** printed and duly bound for 2-Bay VHF FM Antenna with soft copy on pen drive shall be supplied as per details given below: -

(i) For Consignee- 2 Sets of technical manual in hard copies printed and duly bound alongwith one soft copy on pen drive.
(ii) For the following Offices/Officers-One soft copy on pen drive for each offices/officers:
DDG(E-FM), DDG(E-TM), Zonal Office (Maintenance Wing of North zone), Zonal Office (Project Wing of North zone), Technical Library(P&D Unit), R&D & NABM (T)

1.7 GUARANTEE:

The tenderer shall submit with his tender an undertaking to accept the following guarantees:
{This Guarantee clause is applicable to all the equipments/items mentioned in Schedule of Requirements/Materials (un-priced)}.

(i) A guarantee that the equipment supplied will be in accordance with these specifications, varied only to the extent stated in his tender and agreed to in the contract.

(ii) A guarantee to make good within 15 days (from the date of first intimation to OEM/tenderer) at tenderer's expense any component which becomes defective under normal operating conditions, for **36 months** from the date of supply at D-6 Godown Delhi. If the tenderer failed to rectify the fault within the stipulated period of 15 days, the guarantee period for that particular location (site) would be extended corresponding to the outage period.

(iii) A guarantee to supply all components for a period of ten years from the date of acceptance of Equipment at site, at rates at which these are being supplied by him to other customers and also should match prices of original manufactures of these components prevailing at that time.

(iv) If at any stage during next 10 years, the manufacturer stops production of this model of Equipment/items, he shall intimate All India Radio in advance to enable the latter to stock the critical items.

1.8 LANGUAGE/UNITS:

All information supplied by the tenderer & all markings, notes, designation on the drawings & associated write-ups shall be in "**English language"** only.
All dimensions, units on drawings, all references to weights, measures & quantities shall be in MKS.

1.9 DELIVERY OF EQUIPMENT:

Five (5) months from the date of issue of Acceptance of Tender.

1.10 PACKING AND PACKING LISTS:

All the equipment should be securely and properly packed to withstand transit hazards. Equipment packing shall be fit for sea freight and incorporate adequate protection against ingress of moisture. Packing slips giving details of the items contained in each package shall be placed inside the package in a water proof envelop to enable easy identification and should contain cross references to item/part numbers of installation drawings/components lists. Copies of packing slips and other details should be sent separately to respective consignee and also to The Dy. Director General (Engg.) (FM), P & D Unit, DG: AIR, New Delhi.

1.11 INSURANCE AND MARINE RISKS ETC:
Please refer to commercial terms.

1.12 MAINTENANCE SUPPORT AND SPARES:

(a) The minimum recommended essential spares shall be quoted separately by the tenderer.
(b) The minimum recommended essential spares may be based on predicted rate of failure.
(c) In case, the tenderer quotes the optional items as 'a set', the details of the components/items offered in the 'set' must be spelt out clearly including their Make & Model and quantity.

1.13 LOCAL REPRESENTATIVE/DEALER:

(a) The OEM should have complete setup for maintenance/repair of the VHF FM Antenna in India, either of its own or through local office/authorized representative/dealer.

(b) The local office/authorized representative/dealer will be the nodal point for resolving issues related to after sales support. It is the responsibility of local office/authorized representative/dealer to arrange the repair/replacement of faulty items. Any module of VHF FM Antenna requiring repairs will be repaired at site. If it is not feasible to repair the module at site, the same will be collected from the site by local office/authorized representative/dealer that will arrange repairs locally. The cost of transportation, repairs etc. shall be borne by the tenderer during the guarantee period.

(c) After sales support for the repairs/maintenance of VHF FM Antenna after the completion of guarantee period, shall also be provided by the OEM of the VHF FM Antenna through their local office/authorized representative/dealer in India.

(d) The details of technical facilities available with local office/authorized representative/dealer **for after sales support such as test bench, necessary test & measuring equipment and photographs thereof, must be provided in the technical bid.**

(e) At the discretion of AIR, AIR representative(s) may visit the works of local office/authorized representative/dealer of OEM in India to ensure/verify that adequate technical infrastructure is available for after sales service for timely resolving the issues related to attending/replacing the equipments. Tenders from the tenderers who failed to meet these criteria shall be considered incomplete and is liable to be rejected.

SECTION-II

1. One No. 2-Bay vertically polarized (Pole Type) VHF Antenna along with mounting arrangement shall be supplied with each set.
2. The Antenna will be mounted on the top of the tower.
3. Following documents shall be supplied along with the Tender:
   a. VSWR and Return loss curve for complete Frequency range.
   b. Horizontal Radiation Pattern. c. Vertical Radiation Pattern
4. Brief Specifications of the Antenna to be supplied are given below:

S. No.	Parameters	Specifications
1.	Operating Frequency Range	88 MHz -108 MHz
2.	Impedance	50 Ω unbalanced
3.	VSWR	Better than 1.2: 1 over 5 MHz from 100 MHz to 105 MHz and to be optimized to 1.1: 1 for operating frequency (to be intimated later at the time of placement of order)
4.	Power Handling Capacity (Total)	≥ 7.5 kW
5.	Polarization	Vertical
6.	Gain w.r.t. Half Wave Dipole	≥ 4.5 dBd
7.	ightning Protection	All metal parts to be DC grounded.
8.	Branch feeder cables and Clamps for mounting Dipoles	Suitable Branch feeder cable fitted with 7/8" EIA connector at both ends and Clamps to be supplied with the Antenna.
9.	Input Connector of main power divider of antenna system	1-5/8" connector suitable for connecting 1-5/8" RF Coaxial foam dielectric cable fitted with 1-5/8" EIA Connector.
10.	Output Connectors of main power divider of antenna system	7/8" EIA connector
11.	Input Connector of dipoles	7/8" EIA connector
12.	Mounting of Antenna	All the required hardware for mounting of the antenna including Antenna Supporting Interface on which the antenna will be mounted shall be supplied along with the Antenna system.
13.	Maximum Wind Speed	198 km/Hour
14.	Ambient Temperature	-25ºC to 40 ºC
15.	Humidity	95% non-condensing
16.	Rainfall	Moderate to heavy
17.	External material of Dipoles and rigid feed lines	Exterior of dipoles will be made of stainless steel or Marine Brass. Rigid lines with Marine Brass or Copper.
18.	Internal material (for Dipoles, Power Divider, Rigid lines & interconnecting feed cables/ lines)	Inner lines of Dipoles will be of Copper, Brass & those of Power Dividers will be of copper or Brass. All electrical contacts will be silver plated. All inners and bullets of connecting head or mating head will be made of Beryllium copper and silver plated. Insulators will be made of virgin Teflon.
19.	Maximum Wind Speed	198 km/Hour

20.	Dead load (Approx.)	100 Kg including mounting hardware
21.	Wind loading (Approx.)	250 Kg

SECTION-III

INSPECTION DETAILS

2-Bay VHF FM Antenna & accessories will be accepted on the basis of OEM's test certificate of actual performance measurements as per AIR specification before dispatch to All India Radio and receipt of equipments/items at site in good condition.

The Original Equipment Manufacturer's (OEM) test certificates shall be duly signed & stamped on the letter head of the OEM, failing which Original Equipment Manufacturer's (OEM) test certificates will be considered incomplete and equipment offered by the tenderer is liable to be rejected.

Following information should also form part of OEM test certificate for each 2-Bay VHF FM Antenna & accessories.

1. Make, Type, Model and Country of Origin of the accessories and spares.
2. Measurements of all parameters as per Section-II of Technical Specification.

SECTION-IV (A)

SCHEDULE OF REQUIREMENTS/MATERIALS (UN-PRICED) {FOR ONE SET OF 2-Bay VERTICALLY POLARIZED SIDE MOUNT (POLE TYPE) VHF FM ANTENNA}

S. NO.	Description	Make	Model	Qty
1.	Supply of 2-Bay vertically Polarized Side Mount (Pole Type) VHF FM Antenna system complete as per AIR Specification including clamps, technical manual etc.			1Set Complete
2.	Any other items/hardware materials etc. offered for the completeness of the above antenna system. (Item wise details of the offered items/hardware materials etc. shall be given by the tenderer)			1 Lot
3.	Inspection charges at manufacturer's works of VHF FM Antenna as per AIR specification.			1 Lot

SECTION-IV (B)

SPARES (OPTIONAL) {FOR ONE SET OF 2-Bay VERTICALLY POLARIZED SIDE MOUNT (POLE TYPE) VHF FM ANTENNA}

S. NO.	Description	Make	Model	Qty
1.0	List of recommended spares and any other accessories. (Items wise details of offered material including part number are to be given by the tenderer)			1 Set Complete
2.0	(a) "O" ring			1 Set
	(b) Silicon grease			1 Lot
	(c) Connectors assorted sizes			1 Set
	(d) RF distributors air dielectric coaxial cables			1 Set
	(e) Dipole			2 Nos.
	(f) Other miscellaneous items.			1 Lot
3.0	Any other items/hardware etc. offered for the completeness of the above antenna system. (Item wise details of the offered items/hardware materials etc. shall be given by the tenderer)			1 Lot

All India Radio at its own discretion may procure spares for a value not exceeding 10% of the cost of equipments. The tenderer should quote all the essential spares.

ANNEXURE-I

PERFORMA FOR INFORMATION ABOUT LOCAL OFFICE FOR AFTER SALES SUPPORT

1.	Address of Office : Telephone : Fax No. : E-mail Address :	
2.	Address for communication (if different)	
3.	Legal Status (Authorized Representative/ liaison office/registered company etc.)	
4.	Name & Address of Local official	
5.	Brief details of Technical facilities available for after sales support	
6.	Main line of business, specialization and number of years of operation	
7.	Total number of permanent technical employees including their designation and qualification	
8.	Details of Agreement/MoU for after sales support with OEM (Copy must be provided with the offer)	Date of Agreement: Executed at : Executed by :

Annexure-II

List of places (to be supplied at D-6 Godown, New Delhi)