

**REQUEST FOR INFORMATION FOR HIGH POWER HF BROADCAST  
TRANSMISSION SYSTEM WITH ASSOCIATE ANTENNAE  
AND REMOTE KEYING FACILITY**

1. The Ministry of Defence, Government of India, intends to procure an approximate quantity of 50 advanced High Power HF Broadcast Transmission System (HPHBTS) with accessories alongwith antennae system and remote keying facility towards replacement/ modernizing existing HF Broadcast Transmitting Stations (TS) at various locations to provide long range and reliable HF Broadcast communication in Navy.
2. This Request for Information (RFI) for HPHBTS consists of three parts as indicated below:-
  - (a) **Part I.** The first part of the RFI incorporates operational characteristics and features that should be met by the System. Important technical parameters of the proposed System are also mentioned.
  - (b) **Part II.** The second part of the RFI states the methodology of seeking response of vendors. Submission of incomplete response format will render the vendor liable for rejection.
  - (c) **Part III.** This part lays down the guidelines for framing Criteria for Vendor Selection/ Pre-Qualification in Buy Indian (IDDM), Buy (Indian) and Buy & Make (Indian) Cases.

**PART – I: OPERATIONAL AND TECHNICAL REQUIREMENTS**

3. **Intended Use of Equipment (Operational Requirements).** The modernization of existing Transmitting Stations with advanced HPHBTS systems is aimed to enhance the capabilities of existing Transmitting Stations to provide ***worldwide, higher data rates and robust HF digital broadcast communication for naval units afloat and ashore***. The envisaged capabilities of the system to include remote operations wherein keying of Morse (CW) and data communication would be done from Broadcast Controlling Stations over naval terrestrial, Satcom or wireless network using Transmitters and Antennae at Transmitting Stations.
4. **General Description.** The HPHBTS System should be software defined transmitter system for data and voice transmissions. The HPHBTS will generally consist

of the high power HF Tx, Remote keying facility, antennae system, HF interface unit and power supply unit. Radio should consist of latest state of the art SDR technology, ALE 2G/3G with high speed data waveforms compatible with HD VLF-HF Receivers used by Navy for broadcast reception. The System should be modular in design to facilitate quick trouble shooting, repairs and up-gradation. The system should be ruggedized to meet the rigour of the operating environment meeting the requisite standards of EMI/ EMC compliance.

5. **Important Technical Parameters**. The purpose of this Request for Information (RFI) is to obtain information on the envisaged Operational and Technical parameters placed at **Annexure 'IV'**.

6. Vendors should confirm that following conditions are acceptable:-

(a) The solicitation of offers will be as per 'Single Stage -Two Bid System'. It would imply that 'Request for Proposal' would be issued soliciting the technical and commercial offers together, but in two separate sealed envelopes. The validity of commercial offers would be at least 18 months from the last date of submission of offers.

(b) The technical offers would be evaluated by a Technical Evaluation Committee (TEC) to check its compliance with RFP.

(c) The equipment of all TEC cleared vendors would be put through a trial evaluation in India on a 'No Cost No Commitment' basis. A staff evaluation would be carried out by IHQ MoD (N) to analyse the result of field evaluation and shortlist the equipment for introduction into service.

(d) Amongst the vendors cleared by GS evaluation, a Contract Negotiations Committee would decide the lowest cost bidder (L1) and conclude the appropriate contract.

(e) Vendor would be bound to provide product support for time period specified in the RFP, which includes spares and maintenance tools/ Jigs/ fixtures for field and component level repairs.

(f) The vendor would be required to accept the general conditions of contract given in the Standard Contract Document at Chapter VI of DAP.

(g) **Offset (if applicable)**. The vendor has to undertake offset contracts amounting to --- of the value of commercial proposals (refer Appendix E to Chapter II of DAP 20).

- (h) **Integrity Pact (if applicable)**. An Integrity pact along with appropriate Earnest Money Deposit (EMD) is a mandatory requirement in the instant case in accordance with provisions of Annexure I to Appendix O of Schedule I Chapter II of DAP -20.
- (j) **Performance-cum-Warranty Bonds**. Performance-cum-Warranty Bond both equal to 5% value of the contract inclusive of taxes and duties is required to be submitted after signing of contract.
- (k) **ToT (if applicable)**. GOI is desirous of license production of equipment after acquiring ToT in the case.
- (l) **Warranty**. The equipment shall be covered by warranty for replacement by the vendor for a period of two years.
- (m) **Delivery Period**. The equipment to be delivered within 36 months from the effective date of the contract.
- (n) **Spares**. List of Onboard (OB) and Base & Depot (B&D) spares required for supporting the equipment must be provided with cost. Quotations for spares should have a minimum validity of 18 months. Adequacy and continued availability of spares must be ensured prior to placement of orders for procurement of equipment .The list should be split in two parts as follows:-
- (i) **Onboard (OB) Spares**. OB spares should cater for one-year exploitation needs of the equipment and comprise spares, which can be replaced by the ship's staff. OB spares normally comprised items like PCBs, modules, sub-assemblies, lamps, fuses, gaskets etc.
- (ii) **Base and Depot (B&D) Spares**. B&D spares are required to cater for at least five-year exploitation needs of the equipment. They must also comprise adequate quantities of all items included in the OB spares especially more PCB/ LRU/ modules instead of discrete electronic components.
- (p) **Training**. The vendor shall be responsible for the training of operators and maintainers. Details of training schedule for operators and maintainers are to be indicated accordingly. The vendor must provide computer aided instruction packages in CD, instruction notes and special training aids to enable subsequent in-house training being conducted for following categories of personnel : -
- (i) Operators.
- (ii) First/ Second level maintenance personnel.
- (iii) Third/ Fourth level depot maintenance personnel.
- (iv) Training establishment staff.

- (q) **Life Cycle Support.** Vendor would be bound to provide product support for time period specified in the RFP. This would include spares and maintenance tools/ jigs/ fixtures for field and component level repairs. The equipment is to be supported till the service life of the equipment. In the event of non-availability of the components/ sub-assemblies due to obsolescence, the sub-assemblies identical in the form, fit and function shall be provided. Overall life of the equipment should be at least 12.5 years from date of delivery to Naval Transmitting stations. Each set is to be provided with set of OBS and consolidated set for B&D spares to ensure maintainability of the equipment for 3 to 5 years post expiry of warranty.
- (r) **Documentation.** Documentation for the equipment must be supplied as per the latest guidelines promulgated by Indian Navy meeting the requirements Reliability Action Plan. Technical and Operators manuals and other associated technical documents should include internal circuitry details that are required to undertake in-house repairs/ support by Indian Navy.
- (s) **Upgrading of System.** The vendor shall give an undertaking to make available all future upgrades to the system software and hardware. As far as possible, such upgrades should be possible with minimal change of system configuration.
- (t) **Relaxation.** Relaxation or review of any feature or parameters specified herein which could lead to major reduction in cost, complexity or development and production timeframe of the system shall be informed to the user for consideration.

## **PART – II**

### **7. Procedure for Response.**

- (a) Vendor must fill the form of response as given in **Annexure II to Appendix A to Chapter II**. Apart from filling details about company, details about the exact product meeting other generic technical specifications should also be carefully filled. Additional literature on the product can also be attached with the form.
- (b) The filled form should be dispatched at under mentioned address:-

Directorate of Naval Signals  
Room No 2B, Sena Bhawan  
Integrated Headquarters

Ministry of Defence (N)  
New Delhi 110011  
Fax: 011-23010384  
Email ID: [dns-navy@nic.in](mailto:dns-navy@nic.in)

PoC - CDR (NS) Sys II, Contact details 011-23010384

(c) Last date of acceptance of filled form is **eight weeks** from the date of posting of this RFI on MoD website. The vendors short listed for issue of RFP would be intimated.

8. The Government of India invites responses to this request only from Original Equipment Manufacturers (OEM)/ Authorised Vendors/ Government Sponsored Export Agencies (applicable in the case of countries where domestic laws do not permit direct export by OEMs). The end user of the equipment is Indian Navy.

9. The information is being issued with no financial commitment and the Ministry of Defence reserves the right to change or vary any part thereof at any stage. The Government of India also reserves the right to withdraw it should it be so necessary at any stage. The acquisition process would be carried out under the provisions of DAP.

### **PART – III**

#### **GUIDELINES FOR FRAMING CRITERIA FOR VENDOR SELECTION/ PREQUALIFICATION IN 'BUY (INDIAN-IDDMM)' 'BY (INDIAN)' AND 'BUY & MAKE (INDIAN)' CASES**

10. The guidelines prescribed for short-listing/pre-qualification of Indian vendors in Buy (Indian-IDDMM), Buy (Indian) & Buy & Make (Indian) cases are enumerated in the succeeding paragraphs. **Paragraph 11** deals with the parameters that may be considered for short-listing of vendors, whereas **Paragraph 12** amplifies the process for applying selected parameters to the process of vendor short listing.

#### 11. **Parameters.**

##### (a) **General Parameters.**

(i) Applicant Entity should be an Indian Vendor as defined at Paragraph 20 of Chapter 1 of DAP 2020.

(ii) Business dealing with applicant Entity or any of its allied entities should not have been suspended or banned, by MoD/ SHQ or any Government Department or organization (as defined in Guidelines for Penalties in Business Dealings with Entities issued vide Ministry of

Defence,D (Vigilance) MoD ID No 31013/1/2006-D (Vig) Vol II dated 21 Nov 2016). None of the Promoters and Directors of applicant entity should be a wilful defaulter.

(iii) “Entities” will include companies, with whom the Ministry of Defence has entered into, or intends to enter into, or could enter into contracts or agreements.

(iv) Applicant entity” may be a company, subsidiary, an associate company (as defined in the Companies Act, 2013) a consortium or a Joint Venture (JV).

(b) **Technical Parameters.**

(i) Vendor shall be a manufacturing entity or a system integrator of defence equipment and not a trading company, except in case where the OEM participates only through its authorized Vendors.

(ii) Minimum **two Years’** experience in **broad areas like manufacturing/ electronics/ explosives etc as applicable in the instant procurement case.** If not, then cumulative experience of at **least three years in above areas**, resulting in gaining of competence for manufacturing the proposed product.(In case the SHQ feels that for a particular equipment a lesser experience could be accepted, then the same should be got approved by the competent authority before including the same in the RFP).

(iii) Where product involves integration, previous experience **of not less than one year/one project** in integration of systems/equipment shall be required.

(iv) **ICT Cases.**

(aa) Certification to be included if linked to scope of work-Gartner Quadrant/ISO9001/CMMi3 or more (specifying development /service /acquisition models) /ISO27001. For information security and large value projects preferably CMMi5 may be specified.

(ab) Compliance with IEEE/ITU standards depending upon nature/type of project or solution required.

(c) **Financial Parameters.**

(i) **Average Annual Turnover.** Minimum average annual turnover for last three financial years, ending 31<sup>st</sup> March of the previous financial year, should not be less than 30% of estimated cost of the Buy (Indian-IDDM) and Buy (Indian) project and for Buy & Make (Indian) should not be less than 30% of estimated cost of the Make portion.

(ii) **Net Worth.** Net worth of entities, ending 31<sup>st</sup> March of the previous financial year, should not be less than 5% of the estimated cost of the Buy (Indian-IDDM) and Buy (Indian) project and for Buy & Make (Indian) should not be less than 5% of estimated cost of the Make portion. For orders above Rs 5000, the Net worth of group companies can be considered on production of suitable documentary assurance.

(iii) **Insolvency.** The entity should not be under insolvency resolution as per Indian Bankruptcy Code at any stage of procurement process from the issuing of RFP to the signing of contract.

(iv) **Credit Rating (Desirable Financial Parameter).** Long term credit rating equivalent to CRISIL rating on Corporate Credit Scale as **CCR-BBB or better**, and **SME-04 or better for SMEs** issued by credit rating agencies recognized by SEBI. Credit rating should be as on 31<sup>st</sup> March of the previous financial year.

(d) **Other Parameters.**

(i) **Industrial License (IL).** Vendors should be either holding a valid defence industrial license or should have applied for the same before responding to RFP. In any case the vendor must confirm holding of IL before commencement of FET. (Items requiring IL will be as per DIPP Press Note 3 of 2014 as amended from time to time).

(ii) **Registration.** Registered for a minimum of two years (one year for SMEs). Minimum number of years not applicable for JVs constituted specifically for a project.

12. **Stipulations for Applying Parameters.**

(a) Areas like manufacturing/electronics/explosive etc. Referred to at Paragraph 2 (b) (ii) should be defined in each case of procurement.

(b) In case the Applicant Entity is unable to meet the Financial Parameters by itself, it may rely on its **holding Company** (as defined in the Companies Act, 2013 and amendments thereof) ("Companies Act") for fulfilment of the Financial Parameters, in which case reliance must be placed on the Holding Company towards fulfilment of **ALL** the Financial Parameters.

(c) In case the Applicant Entity is unable to meet one or more of the Technical parameters by itself, it may rely on a Group Company (ies) for fulfilment of the Technical parameters. A Group Company in relation to the Applicant Entity may be:-

(i) A Company of which the Applicant Entity it is an Associate Company such company should have ownership, directly or indirectly, of at least 26% of the voting shares of the Applicant Entity.

- (ii) A Company which is an Associate Company of the Applicant Entity. The Applicant Entity should have ownership directly or indirectly, of at least 26% of the voting shares of such Associate Company.
  - (iii) A Company with whom the Applicant Entity is commonly owned, directly or indirectly, for at least 26% of the voting shares by another company. For example: An Applicant Company A is an Associate Company of Company B, in which B holds at least 26%. Further, C is also an Associate Company of B, in which B holds at least 26%. In this case the Applicant Company may use the credentials of C as well.
  - (iv) The Holding Company and Subsidiary companies (as defined under the Companies Act) of the Applicant Entity.
- (d) The Applicant entity may be a single entity or a group of entities (the “consortium” ), coming together to implement the project. In such case:-
- (i) The credentials of only those members of their related entities may counted, who have at least 26% equity stake in the Consortium.
  - (ii) Each Consortium should have a designated **Lead Member**.
  - (iii) For Technical Parameters, **any of the consortium members of their Group Companies** may meet the criteria.
  - (iv) For Financial Parameters. The Turnover and Net Worth of the Consortium Member shall be reckoned **proportionate to Consortium Member’s equity stake** in the Consortium, and each Consortium member should meet the other criteria pertaining to Insolvency and Credit Rating. In case the Consortium Member relies on its Holding Company for any one of the above-mentioned Financial Parameters, then reliance must be placed on the Holding Company for meeting **all the financial Parameters**.
- (e) Vendors should provide all necessary self-authenticated document in support of their achievement of criteria. Such documentation should inter-alia include:-
- (i) Details of projects/supply orders successfully executed in the last two years.
  - (ii) Annual reports for three years of applicant entity, parent and associate companies, consortium and JV partners.
  - (iii) Details of shareholders, promoters, associated, allied and JV companies.



(iv) Details of vigilance action, viz ongoing investigation and suspension/ debarment/ blacklisting actions against the applicant entity or any of its allied entities, parent company or consortium and JV partners, if any by any Department/agency of Central Government.

(v) A Certificate from CA/ CS indicating the financial parameters for the last three years as per Paragraph 2(c).

(f) Any vendor furnishing false information will be liable for action as per existing guidelines.

**REQUEST FOR INFORMATION: PROCEDURE FOR RESPONSE****Request for information for HPHBTS**

1. The Indian Navy is planning to procure advanced HPHBTS including associated antennae system and remote keying facility with the view to identify probable vendors who can undertake the said project for modernizing/ upgrade existing Transmitting Stations. OEMs/ Authorised Vendors are requested to forward information on the product which they can offer. The parameters/ broad specifications of the item are mentioned in the questionnaire attached as per Annexure III to Appendix A. In addition the vendors are required to furnish details as per Proforma at Annexure II to Appendix A.

2. Apart from the information as per the Appendices the vendors may also forward technical details/ product brochures/ literature etc pertaining to the items in question.

3. The required information/ details may please be forwarded at the following address by **29 Dec 2022**:-

(a) **User Directorate.**

Directorate of Naval Signals  
Room No 2B, Sena Bhawan  
Integrated Headquarters  
Ministry of Defence (N)  
New Delhi 110011  
Fax: 011-23010384  
Email ID: dns-navy@nic.in

(b) **Procurement Directorate.**

Directorate of Naval Signals  
Room No 2B, Sena Bhawan  
Integrated Headquarters  
Ministry of Defence (N)  
New Delhi 110011  
Fax: 011-23010384  
Email ID: dns-navy@nic.in

(c) **Planning Directorate.**

Directorate of Naval Signals  
Room No 2B, Sena Bhawan  
Integrated Headquarters  
Ministry of Defence (N)  
New Delhi 110011

Fax: 011-23010384

Email ID: dns-navy@nic.in

(d) **ADG Acquisition Technical.**

O/o Technical Manager (M & S)  
Room No 5, D-2 Wing  
Ground Floor, Sena Bhawan  
Rajaji Marg  
New Delhi 110011  
Tel: 011-23011540,  
Fax: 011-23017684

## Annexure II to Appendix A

**VENDOR INFORMATION PROFORMA**

1. Name of the Vendor/Company/Firm.

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(Company profile including Share Holding pattern, in brief, to be attached)

2. **Type (Tick the relevant category)**

Original Equipment Manufacturer (OEM)

Yes/No

Authorised Vendor of foreign Firm

Yes/No (attach details, if Yes) others  
(give specific details)

3. Contact Details.

Postal Address.....;

City: .....

State:-

Pin Code.....Tele.....

Fax.....URL/Web Site.....

Email.....

4. Local/ Branch/ Liaison Office/Agent (if any) at New Delhi.

Name & Address:.....

Pin Code:.....Tel:.....Fax:.....

Email:.....

5. Financial Details: Category of Industry (Large/Medium/Small-scale):.....

6. **Certification by Quality Assurance Organisation.**

<b><u>Name of Agency</u></b>	<b><u>Certification</u></b>	<b><u>Applicable from (Date &amp; Year)</u></b>	<b><u>Valid till (Date &amp; Year)</u></b>

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7. **Details of Registration.**

<b><u>Agency</u></b>	<b><u>Registration No</u></b>	<b><u>Valid till (Date)</u></b>	<b><u>Equipment</u></b>
GeM			
DGQA/DGAQA/DGNAI			
OFB			
DRDO			
Any other Government Agency			

8. **Membership of FICCI/ ASSOCHAM/ CII or other Industrial Associations.**

**Name of Organisation**

**Membership Number**

9. **Equipment/Product Profile (to be submitted for each product separately)**

- (a) Name of Product:.....  
(IDDM Capability be indicated against the product)  
(Should be given category wise)
- (b) Description (attach technical literature):.....
- (c) Whether OEM or Integrator:.....
- (d) Name and address of Foreign collaborator (if any):.....
- (e) Industrial Licence Number:.....
- (f) Indigenous component of the product (in percentage):.....
- (g) Status(in service/design& development stage):
- (h) Production capacity per annum:
- (j) Countries/agencies where equipment supplied earlier (give details of quantity supplied):

.....

.....

(k) Estimated price of the equipment.....

10. Alternatives for meeting the objectives of the equipment set forth in the RFI.

11. Any other relevant information:.....

12. **Declaration**. It is certified that the above information is true and any changes will be intimated at the earliest.

(Authorised Signatory)

## Annexure III to Appendix A

**REQUEST FOR INFORMATION: QUESTIONNAIRE**

Ser	Specifications/ Parameters	Reply
1.	What is the frequency range of the proposed HPHBTS system? How many pre-set/pre- programmed channels are available? What is the channel spacing available in the entire frequency range?	
2.	Is the HPHBTS system based on the Digital Signal Processor (DSP) and Field Programmable Gate Array (FPGA) technology in radio engineering? Is the set based on SDR concept and is SCA compliant?	
3.	Does the HF system comprise of integrated IF stage (using DSP) followed by dedicated RF stage for both voice and data in narrow band and wide band? If yes, what is the bandwidth?	
4.	Please furnish details of MTBF, MTTR etc.	
5.	Does the HPHBTS system have automatic frequency tuning and power setting?	
6.	What is the maximum weight of the HF set along with associated assemblies, rack and dimensions of the HPHBTS?	
7.	Does the in-built test features facilitate defect identification and defect rectification up to module level? Please furnish all the relevant details of BITE of the proposed set including availability of audio and visual alarms, level of fault identification and provision of display of forward and reflected power, etc.	
8.	Is it possible to manage all operational functions of the Radio, such as remote control, configuration, BITE and data to/from internal / external HF modem, etc, through the Ethernet port of the radio?	
9.	Does the software cater for easy de-bugging and follow the laid down industry standards? If yes, what standards are followed? Does the architecture of the software cater for easy re-loading of corrected embedded software / firmware by <i>IN</i> maintainer?	

Ser	Specifications/ Parameters	Reply
10.	Is the HF system of modular design and field serviceable? Indicate number of modules comprising the HPHBTS. Is the architecture (software & hardware) open to cater for future growth and provides for graceful degradation in terms of output power reduction? What will be minimum output power available in case of high VSWR?	
11.	Is the HPHBTS capable of ALE 2G/3G/4G and compatible with ALE 2G ?	
12.	Is the HPHBTS capable of frequency hopping in the complete band? Does it have an external/internal GPS reference? What is the hop rate of the set (hops/sec)?	
13.	Please give details of the various protocols of the set to facilitate interfacing with ATUs, external devices, modems, Remote Communication Control System etc.	
14.	Is the set capable of remote operation through a secondary processing device as a Remote Communication Control System or similar system? Are the PCBs and application software of the secondary processing device 'OS' independent? Type of remote communication controlling system?	
15.	Is the radio IP based with capability of being networked via Ethernet port for facilitating remote control configuration, BITE, data to/from internal HF modem, etc? Is the remote control modem separate from the data modem?	
16.	Does the HPHBTS have staged power amplification with only one amplifier or a combination of power amplifier modules? Is the set capable of operating with user selectable power? If yes, what are the different selections available for low power, medium power and high power requirements?	
17.	In case of more than one power amplifiers, is the power supply common or do the amplifiers have independent power supplies? Also, in case of failure of one amplifier, will the other amplifiers continue to stay in operation mode?	
18.	Give details of cooling arrangement of power amplifiers including source of cooling, whether internal or external.	



Ser	Specifications/ Parameters	Reply
19.	For what duration can the set be operated continuously in Transmit mode?	
20.	Does the HPHBTS provide for Ethernet or RS 232 or RS 242 ports for transfer of data? How many ports are provided on the front or rear panels.	
21.	What is the data transfer rate of the set using internal modem? What MIL STDs does the external/ internal modem conform to?	
22.	Does the set provide analogue connectivity for audio input and output connection?	
23.	Does the system provide facility for configuration, allocation, monitoring and control of the radio features through one single MMI unit?	
24.	Does the system have a high visibility display providing brightness and contrast control? Give details of display viewing angles and limitations, if any. Also list the details of parameters/features available for viewing on the front panel display.	
25.	Give details of dummy load and details of facilities that can be checked, including BITE?	
26.	Does the HPHBTS have inbuilt security features? If yes, type.	
27.	If no in-built security feature, does system provide scope of interface with external crypto system?	
28.	Type/ types of antennae proposed.	

29. Please indicate the values of the parameters indicated below with respect to the system being offered, including MIL-STDs complied with (if applicable):-

(a)		
Ser	General - Specifications/ Parameters	Values
(i)	Frequency range.	
(ii)	Output Power (including values of various selectable powers for low, medium and high power selection).	

(iii)	Modes of Operation (waveforms), including data available. (CW, AM, SSB, ISB, FSK, Data mode etc along with channel designators such as A3E, J3E, etc).	
(iv)	Side Suppression.	
(v)	Carrier Suppression.	
(vi)	Intermodulation Suppression.	
(vii)	Harmonic Suppression.	
(viii)	Audio Bandwidth.	
(ix)	Data Bandwidth.	
(x)	Antenna Tuning with AE Coupler.	
(xi)	Frequency Accuracy.	
(xii)	Antenna Matching.	
(xiii)	Frequency Stability.	
(xiv)	RF Power Output (in terms of deviations from PEP and continuous operations).	
(xv)	RF Power Level Adjustment.	
(xvi)	Load Impedance.	
(xvii)	VSWR Protection open and short in all power output levels.	
(xviii)	Spurious Emission.	
(xix)	Duty Cycle.	
(xx)	Frequency Response.	
(xxi)	Carrier Suppression.	
(xxii)	Inter-modulation products.	
(xxiii)	Graceful degradation.	
(xxiv)	MTBF.	
(xxv)	Frequency tuning.	
(xxvi)	Protection.	
(xxvii)	Selectivity.	

(xxviii)	Sensitivity.	
(xxix)	Audio output distortion	
(xxx)	Squelch.	
(xxxi)	Control interface	
(xxxii)	Spurious suppression/ rejection	
(xxxiii)	No of preset channels	
(xxxiv)	Frequency resolution	
(xxxv)	Over voltage, over current and over temp protection.	
(xxxvi)	Channel spacing.	
(xxxvii)	Secure communication and external crypto device interface provision.	
(xxxviii)	In band noise.	
<b>Ser</b>	<b>Specifications/ Parameters</b>	<b>Reply</b>
30.	What are the LPI features available in the proposed set?	
31.	What are the communication security features available in the proposed set?	
32.	Give details of power supplies required (AC/DC or both) along with the operating values (voltages, frequencies, phase) and range of fluctuations that the set is capable of withstanding.	
33.	Does the set have reverse polarity protection and auto changeover facility of the supply?	
34.	Is the power supply unit inside the radio chassis or mounted on the same rack or is external to the radio rack	
35.	What type/ types of antennae is/ are proposed to be supplied? Kindly furnish the details.	
36.	What is the radiation pattern and polarization of the antenna? Is the associated ATU capable of frequency hopping as per the radio set's requirements?	

37.	Is the impedance matching available for the complete frequency range? What is the maximum VSWR associated with the set? What is the impedance offered by the antenna at the port and which type of connector will be used?	
38.	Has the RF mapping of the proposed set along with the associated antenna and ATU been undertaken/ simulated? If yes, kindly indicate the figures obtained along with the distance of the hazard zone.	
39.	Please indicate the MIL-STDs that the set will comply with/ has been certified for in respect of the following:-	
	(a) Environmental testing.	
	(b) Environmental Stress Screening.	
	(c) EMI/EMC.	
	(d) Burn-in/ endurance testing.	
	(e) Waveform supportability.	
	(f) Storage temperature.	
	(g) Operating temperature.	
	(j) Humidity.	
	(k) Dust and water intrusion proofing.	
	(l) IP rating test as per operating location.	

40. List the binding specifications for the undermentioned requirements that the set would comply with:-

Ser	Specification/ Parameters	Applicable Standard
(a)	Tx/Rx Characteristics.	
(b)	Documentation.	
(c)	Human Engineering.	
(d)	PCB Testability.	

Ser	Specification/ Parameters	Reply
41.	Give details of standards for protection against dust, humidity, shock, rain, vibration, weatherproofing/splash proofing of panels, ruggedisation for tropical conditions, etc?	
42.	Will the set be protected against the following?	
	(a) Reverse polarity? What are the built in safety devices?	
	(b) Short/open circuit antenna connection?	
	(c) Lightning?	
	(d) Over voltage protection.	
	(e) Under voltage protection.	
	(f) Over current protection	
	(g) Surge voltage/ current protection	
43	<p>Indicate the specifications of HPHBTS T will comply in respect of following:-</p> <ul style="list-style-type: none"> <li>(a) HV specifications</li> <li>(b) /R specification.</li> <li>(c) Connector specification.</li> <li>(d) Switches.</li> <li>(e) Cable and Harness assy specification.</li> <li>(f) Soldering electronics and electrical assy specification.</li> <li>(g) Battery specification in case battery backup is considered for power supply requirements.</li> <li>(h) LCD/ LED grade needed for reliable operation.</li> </ul>	
44.	Give details of design for EMI/EMC compatibility such as provisioning of gaskets, grounding, RFI filtering, use of shielded twisted pair cables, multi-core twisted pair cables, etc?	
45.	Will the DC supplies be adequately filtered with each PCB provided with transient suppressors?	
46.	Give details of previous supplies & orders/ customers for similar sets.	
47.	COTS sub-system/ items at par/ below par with JSS 55555 or equivalent MIL Std utilized in HPHBTS with corresponding standards that it will comply if applicable, be specified.	

48.	Details of percentage of min indigenous components & max imported components mandatory in HPHBTS if applicable, be specified.	
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49. **After Sale Support.** The following details will be provided by the vendor:-

- (a) Repair methodology being proposed.
- (b) What kind of Engineering Support Package (ESP) and life time support can be provided alongwith financial implications?
- (c) How are similar kind of systems being maintained by the vendor?
- (d) Will the requisite spares, SMT/ STE be provide by the vendor for carrying out component level repairs?
- (e) What would be the training mechanism for operators and maintainers?
- (f) Proposal for CAMC/ RRC with cost implications.

50. **Product Support and Upgradability.** The vendor shall indicate and give details of the information sought listed below:-

- (a) All major repairs and overhaul facilities for major assemblies and component level owned by the vendor India.
- (b) Base overhaul facilities and availability of infrastructure in India.
- (c) Management of repairs and spares post warranty.
- (d) Upgrade for software (as applicable).
- (e) Upgradability of hardware for enhanced performance features or due to modifications required to obviate recurring defects.
- (f) Vendor shall indicate conformity to submission of Manufacturers Recommended List of Spares (MRLS), Illustrated Spare Part List and Technical Manuals including for STEs.
- (g) Vendor shall indicate compliance to Tangible Obsolescence Management Plan and plane for upward compatibility with latest modules.
- (h) Vendor shall provide details of vendors/ sub-vendors and readiness/ lead time towards provisioning of spares.

51. **Manufacturing and Production Aspects.**

- (a) Vendor shall provide details of all R&D and manufacturing infrastructure.
- (b) **Indigenization.** Vendor shall give out ability and willingness to supply the product to meet the requirements of Buy (Indian-IDDM) and/ or Buy (Indian) to meet the aim of indigenization as per the provisions and spirit of DAP 2020.

- (c) **Production Capacity.** Vendor will give out his current and planned annual production capacity and proposed delivery schedule of the equipment. The timeline required to deliver required quantity of the equipment for trials and post contract, time required to deliver the equipment.
- (d) Vendor should indicate willingness to participate in trials as per DAP 2020 in India on NCNC basis.
- (e) Vendor should give details on use of indigenous military material and software indicating plan for sourcing material and cost implications vis-à-vis foreign sourcing of material.
52. **Imports.** In case of imported contents, the vendor shall intimate the likely time and clearance required for import of the equipment for trails in India.
53. **Test Standards.** Inputs on test standards adopted for similar equipment type be indicated. Equipment procured by Indian Navy has to undergo environmental test and other relevant checks by nominated CQAE, FATs as per Mil Std/ JSS 55555 requirements.
54. Certification. Parameters for which certifications can be made applicable and provided in lieu of trials evaluation. Details of parameters of the equipment which can be certified from NABL accredited labs will be indicated.
55. **Financial Aspects.** Vendor shall intimate the cost of One HPHBTS system, including associated antennae system, remote keying facility and all accessories inclusive of taxes and duties. Details of cost should also include product support package, training, additional details as deemed appropriate.
56. **Compliance with Provisions of DAP 20.** Vendor should indicate compliance with all provisions of DAP-20. If not, which Para/ clause of DAP-20 not agreed with reasons be indicated.
57. Vendor should also indicate willingness for option clause as per DAP 2020.
58. **Training.** Vendor shall indicate ability and willingness to offer following:-
- (a) Training aggregate for conduct of training like projection system, technical literature, slides, blow up diagrams, training work modules, brochures and Computer Based Training package.

(b) Vendor shall indicate the facilities available at Vendor's premises to conduct training. Vendor should also indicate training for user, maintainers, and QA personnel.

(c) Recommended training period for users, maintainers and QA personnel.

(d) Availability and cost of simulators if any.

(e) Availability of willingness of the vendor to provide hard and soft copies of the User Handbook, Design Specifications, Technical Manuals along with CBT for training.

59. **Manpower Requirement.** Details with respect to manpower requirements to operate and maintain the HPHBTS be indicated.

60. If vendor is MSME and/ or Startup, relevant information and supporting documents are to be provided.

61. Vendors to specify the protocols/ security features being followed to maintain cyber security of the transmitter. Please indicate acceptability and implementation of provisions with respect to security/ malicious codes as per DAP-20.

62. **Undertaking on Debarment.** Vendor should provide an undertaking that it was never banned/ debarred from doing business dealing with MoD/ GoI/ or any other Govt organization.

63. Indicate if same or similar system has been supplied to any other customer along with details of deviation in capabilities and cost, if any.

64. **Miscellaneous.**

(a) Extract of relevant technology perspective, and capability roadmap to be included.

(b) Any futuristic plans for modification and or modernization plans for the equipment being offered.

(c) Vendor may consider RFI as advance information to obtain requisite government clearances.



**Annexure 'IV'**  
**(Refers to Para 5)**

**OPERATIONAL AND TECHNICAL PARAMETERS**

**Operational Parameters**

1. The broad operational parameters of the envisaged project is enumerated in succeeding paragraphs. Vendors' information may not be limited only to the following features and additional information may also be provided:-

- (a) **Frequency Range.** 1.5 to 30 MHz.
- (b) **Modes of Operation.** Apart from voice and CW operations, capability of data, and file transfer features also to be indicated. Feasibility to provide relay facility wherein the received data could be re-transmitted immediately on the same/ other frequency and also establishment of a communication network. Feasibility of accepting data through serial port to inbuilt modem for data communications may also be indicated.
- (c) **Automatic Link Establishment (ALE).** Provision to adjust transmitted power should be available in the ALE mode.
- (d) **Secure Communications/ Low Probability of Intercept (LPI).** Vendor to indicate ECCM method for secure and jam-resistant voice and data links. Frequency Hopping rate to be indicated.
- (e) **Remote Operation.** HPHBTS set to be capable of remote operation through an external PC/ Laptop. The PCBs and Application Software of the remote control laptop/ desktop PC should be compatible with the latest operating systems. The system should be capable of remote control operation through naval terrestrial and wireless equipment.
- (f) **Variable Power Output.** The system should be capable of operating with user selectable power.
- (g) **Minimum Tunable Freq Steps.** The set should be tunable in steps to provide maximum flexibility in operating frequency.
- (h) Software Defined HF Radio set with facility to be networked with Ethernet.
- (j) Bandwidth for voice as well as Data communication.
- (k) Waveform supportability.
- (l) Data waveforms porting capability.

(m) Hop set/security key loading Waveform loading capability (i.e. Provision of Connector in Front panel and interface with Security module).

### **Technical Parameters**

2. The broad technical parameters of the envisaged HPHBTS enumerated in succeeding paragraphs. Vendors' information may not be limited only to the following features and additional information may also be provided:-

- (a) **General Architecture**. Modern High Power HF Transmitters with high spectral efficiency, advanced crypto features and Digital Signal Processing.
- (b) Prolonged operation of HPHBTS.
- (c) Frequency Resolution.
- (d) Frequency Stability.
- (e) **Channels**. Indicate channel spacing and maximum no of channels possible which are remote programmable and also manually programmable from equipment.
- (f) **Environmental Conditions**. The equipment should be able to operate without any degradation in performance within the environmental conditions as per relevant Mil Std.
- (g) **EMI/EMC**. The equipment should be suitably hardened for EMI/EMC environment. Maximum use of OFC based technology should be made so as to save on space, obviate losses and interference. The equipment should be compliant to latest EMI/ EMC standards.
- (h) **Dimensions**. Equipment must be as small and light as possible, modular in design and construction with potential for future growth.
- (j) **Data Rate**. To be indicated for digital communication.
- (k) **ATU**. The antenna tuning unit (ATU) preferably be located close to the transmitter to facilitate monitoring. Also, provision of displaying the forward and reflected power in the ATU indicator.
- (l) Types of antennae proposed and their integration with High Power HF Transmitter. Type of keying facility proposed and its integration.
- (m) **Common Aerial Working (CAW)/ Antennae Switching Matrix**. Feasibility of integration of Transmitter with a CAW and antennae switching matrix.

3. **MMI Aspects**. The broad MMI aspects are as follows:-

- (a) **High Visibility Florescent Displays (VFD)**. There should be VFD which provides better brightness and contrast compared to TFT/LCD displays, allowing

clearer viewing from wider range of angle. The front panel display should show current status of a number of functions of the HF set.

(b) **USB Interface for Front and Rear Panel.** Suitable number of USB ports may be provided on the front and rear panels for easy connection and integration with other equipment and accessories.

(c) User friendly GUI.

4. **Maintainability/ Design Aspects.**

(a) **BITE.** Built in Test facility to be available with audio and visual alarms with failure localisation down to module level/ Line Replaceable Unit (LRU) for speedy fault finding and maintenance.

(b) The required periodic maintenance is to be specified.

(c) **Reliability.** Indicate MTBF (Mean Time Between Failure) of equipment and MTTR (Mean Time To Repair) of Line Replaceable Units.

(d) **Test Equipment.** Indicate details, including cost, of all the test equipment, tools and test jigs required to undertake repairs i.e. 'Operator', 'Intermediate' & 'Depot' level.

(e) Frequent failing components to have mounting base instead of direct soldering on PCB's

(f) Connectors to be in-built in rack i.e. chassis mounted as external cables are prone to defects due to fair wear and tear.

(g) Strong and easily accessible railings for insertion/ removal of sub units.

(h) **Power Supply.** Mains 415-440V / 220V 3 Phase AC RMS, 50 Hz + 10% AC supply. UPS rating, protection features with reverse polarity protection etc.

(j) **Licenses.** Licenses, wherever applicable, are to be provided with a minimum validity of 15 years with free software updation.

(k) **Compatibility.** The compatibility of HPHBTS with existing data equipment/ OS/ Software/ receivers may be ascertained.

(l) **POST.** Equipment should have POST to identify defects upto PCB level.

5. **Costing.** Vendor to indicate a rough cost of the equipment (HPHBTS with accessories/ OBS/ B&D Spares/ Antennae/ interfaces/ remote keying system).