



Request for Information (RFI)

**For the Selection of Partner for Technology Transfer of
High Capacity Radio Relay (HCRR) Manufacturing
Reference No: ITI/COR/P&T/RFI/HCRR/2024/01**

**ITI LIMITED
Registered & Corporate Office
ITI Bhavan, Dooravaninagar
Bengaluru - 560 016
CIN No: L32202KA1950GOI000640**

RFI released: 11.11.2024
Deadline for Responses: 25.11.2024

1. INTRODUCTION

ITI Limited (ITI), a Public Sector Undertaking under the Department of Telecommunications, Ministry of Communications, is a leading Telecom equipment manufacturer and turnkey solution provider in Information and Communication Technologies (ICT) and Telecom Domain in India. ITI is having state of the art electronic manufacturing infrastructure in its plants situated at Bengaluru, Palakkad, Rae Bareli, Mankapur and Naini. It has PAN India presence through its Marketing, Services & Project offices (MSP). The major customers are Government/ Defence/ Paramilitary forces/Railways/PSUs like BSNL, MTNL/Private Corporates.

More information can be viewed on www.itilttd.in .

2. Scope of RFI

ITI has been Developing its own HCRR having all the recent features, To address the latest market trends, strengthen its manufacturing capabilities, ITI is looking for Partner who will enable ITI with Technological details to manufacture HCRR (High Capacity Radio Relay).

In this regard to study the market scenario information is sought from parties having proven technological capabilities in “HCRR“. Based on this market study ITI will floating a Request for Proposal with certain eligibility criteria to select a manufacturing partner for HCRR.

All parties having proven technological capabilities in “HCRR (High Capacity Radio Relay) “are requested to furnish the information sought in Annexure – A certified by authorised person of the company via post/E-mail to the following address,

Email: pp_crp@itilttd.co.in

DGM – Products & Technology,
ITI Limited,
Regd. & Corporate Office,
ITI Bhavan, Doorvaninagar
Bangalore - 560 016

3. General conditions of RFI

- a. This document is neither an offer letter nor a legal contract.
- b. All incidental expenditure incurred in preparation/ submission of the RFI shall be borne by the participating Parties.
- c. The Parties must ensure the ITI receives the Response at the correct address on or before the Deadline for Responses.
- d. After the Deadline for Responses, ITI will acknowledge receipt of the Response.
- e. The Parties must ensure that all information they provide to the Buyer:
 - i. is true, accurate and complete
 - ii. is not misleading in any material respect
 - iii. does not contain material that infringes a third party's intellectual property rights
- f. ITI may ask the parties for more information or clarification on the Response at any time during the RFI process.

4. Confidentiality:

The bidder must undertake that they shall hold in trust any Information received by them, under the Contract/Agreement, and the strictest of confidence shall be maintained in respect of such Information. The bidder has also to agree:

- 4.1 To maintain and use the Information only for the purposes of the Contract/Agreement and only as permitted by ITI;
- 4.2 To only make copies as specifically authorized by the prior written consent of ITI and with the same confidential or proprietary notices as may be printed or displayed on the original;
- 4.3 To restrict access and disclosure of Information to such of their employees, agents, strictly on a "need to know" basis, to maintain confidentiality of the Information disclosed to them in accordance with this Clause; and
- 4.4 To treat all Information as Confidential Information.

5. Arbitration:

Any dispute arising out of this RFI shall be settled and resolved as per the dispute resolution and arbitrations clause agreed between the Parties under the main Contract.

6. Dispute Resolution & Jurisdiction

Notwithstanding anything contained herein above, in case of any dispute, claim and legal action arising out of this RFI, the parties shall be subject to the jurisdiction of courts at Bangalore, Karnataka State, India only. Law of India will be applicable for Dispute Resolution.

Annexure - A

Sl No	Information sought	Reply
1	Name and address of the company	
2	Contact Details (Contact person name with designation, Telephone Number, FAX, E-mail and Web site)	
3	Area of business	
4	Annual Turnover for 3 financial years (₹ in Cr)	
5	Annual Turnover for 3 financial years from HCRR Business (₹ in Cr)	
6	Net worth of the company for Previous 3 financial years.	
7	Date of Incorporation	
8	Number of technical manpower in company's rolls	
9	Number of R&D engineers in HCRR technology	
10	Specification of HCRR System manufactured by the Party	
11	Whether complying to the tentative technical specifications mentioned in Annexure-D	Y/N
12	OEM/ODM/representative of OEM/ODM	
13	Willingness for complete Technology Transfer of HCRR on Royalty basis	Y/N
14	Whether firm's manufacturing unit is present in India? If Yes please provide the address	Y/N
15	Whether R&D unit is present in India? If Yes please provide the address	Y/N
16	Willingness to provide 5-10 HCRR systems for PoC in ITI if required	Y/N

17	Experience details in supply of HCRR systems in last 3 years (Customer and Number of systems supplied)	
18	Whether IPR or copyright/License/Design of the HCRR are owned by the Party/Registered in India?	Y/N
19	Whether complying to any certifications and approvals (TEC/IS/NABL) if yes specify the certifications and standards complied	Y/N
20	Details of Previous Technology Transfer project executed in the past	
21	Critical components required for establishing HCRR manufacturing plant	

Note: Please submit the signed copy of Annexure - B & Annexure - C along with Annexure- A.

Annexure B - Undertaking by Bidder

Place:

Date:

To:

Bengaluru-560016

Undertaking (To be submitted by all Bidders' on their letter head)

We _____ (bidder name), hereby undertake that-

1. As on date of submission of tender, we are not blacklisted by the Central Government / any of the State Governments / PSUs in India.

2. We also undertake that, we are not involved in any legal case that may affect the solvency / existence of our firm or in any other way that may affect capability to provide / continue the services.

Yours faithfully,

Authorized Signatories

(Name, Designation and Seal of the Company)

Date

Annexure C – Confidentiality / Non-Disclosure Agreement

This CONFIDENTIALITY AGREEMENT (the “Agreement”) entered into on this _ day of 2023, and shall be deemed to have become in full force and effect from (the “Effective Date”).

BY and between M/s. _____ a company incorporated under the provisions of the Companies Act, _____ in force in India, having its registered office at _____ (hereinafter referred to as “-----” or “Vendor” which expression shall, unless it be repugnant or contrary to the context or meaning thereof, mean and include its, successors and permitted assigns) of the ONE PART

AND

ITI Limited, a Government of India Undertaking having its registered and corporate office at ITI Bhavan, Doorvaninagar, Bengaluru – 560016 (hereinafter referred to as “ITI” which expression shall, unless it be repugnant to the context or meaning thereof, mean and include its successors and permitted assigns), of the OTHER PART:

----- and the ITI shall hereinafter jointly be referred to as “Parties” and individually as a “Party”.

In this Agreement, “**Affiliate**” means any entity which from time to time Controls, is Controlled by or is under common Control with the relevant party or entity, where “Control” means having the ability (including, without limitation, by means of a majority of voting rights or the right to appoint or remove a majority of the board of directors) to control the management and policies of an entity.

WHEREAS:-

- i i. Vendor inter-alia is engaged in the business of providing IT related solutions & services to various business entities in India & abroad.
- ii ii. ITI has agreed to disclose, transmit, receive, and/or exchange certain “confidential information” to cover the business transaction between parties for the provision of services related to ” (“the Purpose”) as more particularly described in Purchase Order no , issued by ITI in favor of M/s. -----.

NOW THIS AGREEMENT WITNESS:

1. Interpretation

In this Agreement “**Confidential Information**” means all information belonging to a Party that is or has been disclosed to one Party (the “Receiving Party”) by the other Party (the “Disclosing Party”) in connection with the business transacted/ to be transacted between the Parties. Confidential information shall also include any copy, abstract, extract, sample, note or module thereof. The Receiving Party may use the Confidential Information solely for and in connection with the business transacted/

to be transacted between the Parties. Notwithstanding the foregoing, "Confidential Information" shall not include any information which the Receiving Party can show: (a) is now or subsequently becomes or is in possession of the Receiving Party, legally and publicly available without breach of this Agreement by the Receiving Party, (b) was rightfully in the possession of the Receiving Party without any obligation of confidentiality prior to receiving it from the Disclosing Party, (c) was rightfully obtained by the Receiving Party from a source other than the Disclosing Party without any obligation of confidentiality, (d) was developed by or for the Receiving Party independently and without reference to any Confidential Information and such independent development can be shown by documentary evidence, or (e) is disclosed pursuant to an order of a court or governmental agency as so required by such order, provided that the Receiving Party shall, unless prohibited by law or regulation, promptly notify the Disclosing Party of such order and afford the Disclosing Party the opportunity to seek appropriate protective order relating to such disclosure.

2. Confidentiality:

2.1 Except to the extent as agreed herein, the Receiving Party agrees to regard, preserve and keep as secret and confidential all Confidential Information of the Disclosing Party or its clients or any member of their group disclosed under this Agreement. In maintaining confidentiality hereunder the Receiving Party agrees and accepts that it shall not, either on its own account or jointly with or for any other person, firm, company or any other entity, without obtaining the written consent of the disclosing party.

I. disclose, transmit, reproduce or make available any such Confidential Information to any person firm, company or any other entity other than its directors, partners, advisers, agents or employees, who need to know the same for the purpose of evaluating, preparing, considering, negotiating, advising in relation to or in furtherance of the purpose aforesaid; or

II. use the Confidential Information for any purpose other than evaluating, preparing, considering, negotiating, advising in relation to or in furtherance of the purpose for which it is disclosed; or

III. disclose, announce or otherwise publicize the existence of its association with the Disclosing Party or the existence of the project with the Disclosing Party or any other arrangement (existing or possible) between the disclosing party, its clients or itself in connection with any project/assignment; or

IV. use any such Confidential Information for its own benefit or the benefit of others or do anything prejudicial to the interests of the Disclosing Party or its clients or any member of their group or their projects.

2.2 The Receiving Party also agrees and accepts that it may endeavor:

I use at least the same degree of care in safeguarding such Confidential Information as it uses for its own Confidential information of like importance and such degree of care shall be at least that which is reasonably calculated to prevent such inadvertent disclosure;

II keep the Confidential Information and any copies thereof secure and in such a way so as to prevent unauthorized access by any third party; limit access to such Confidential Information to those of its (including its Affiliates") directors, partners, advisers, agents or employees who are directly involved in the

IV consideration/evaluation of the Confidential Information and bind each of its directors, partners, advisers, agents or employees so involved to protect the Confidential Information in the manner prescribed in this Agreement; and

V upon discovery of any disclosure or suspected disclosure of Confidential Information, to take reasonable effort to as per the circumstances, to inform the Disclosing Party of such disclosure in writing and immediately return to the Disclosing Party all such Information, in whatsoever form, including any and all copies thereof.

3. Return or destruction:

The Receiving Party may, upon completion of the purpose mentioned aforesaid or at any time on receipt of a written demand from the disclosing party: i) immediately return all written Confidential Information and all copies thereof provided to, or produced by, it or its advisers, as the case may be, which is in such party's possession or under its custody and control; ii) to the extent practicable, but without prejudice to the obligations of confidentiality herein, immediately destroy all analyses, compilations, notes, studies, memoranda or other documents prepared by it or its advisers to the extent that the same contain, reflect or derive from Confidential Information relating to the other party; iii) so far as it is practicable to do so (but, in any event, without prejudice to the obligations of confidentiality contained in this Agreement), immediately expunge any Confidential Information relating to the Disclosing Party or its clients or any member of their group or their projects from any computer, word processor or other device in its possession or under its custody and control.

4. Permitted disclosure:

The provisions of paragraph 2 shall not restrict any disclosure required by law or by any court of competent jurisdiction, the rules and regulations of any recognized stock exchange or any enquiry or investigation by any governmental, official or regulatory body which is lawfully entitled to require any such disclosure provided that, so far as it is lawful and practical to do so prior to such disclosure, the Receiving Party shall promptly notify the other party of such requirement with a view to providing the opportunity for the Provider to contest such disclosure or otherwise to agree the timing and content of such disclosure.

5. Ownership of Information:

Except to the extent as agreed herein, the Confidential Information and copies thereof, in whatsoever form shall at all times remain the property of the Disclosing Party or its clients and its disclosure shall not confer on the Receiving Party any

rights (including any intellectual property rights) over the Confidential Information whatsoever beyond those contained in this Agreement.

6. No Representation:

Neither the disclosure, transmission receipt or exchange of Confidential Information nor anything else in this Agreement will constitute an offer by or on behalf of the Disclosing Party or be construed as soliciting any business or organization changes or any assurance of any business commitment or an inducement to incur / undertake any obligations not specified herein and neither party will be under any obligation to accept any offer or proposal which may be made by the other or on behalf of such other party.

7. Remedies and Relief:

The parties hereto acknowledge that remedies at law may be inadequate to protect the Disclosing Party or its clients against any actual breach of this Agreement by the Receiving Party, and, without prejudice to any other right and remedies otherwise available to the Disclosing Party or its clients, the Receiving Party agrees that Disclosing Party has a right to seek injunctive relief in its favor upon proof of actual damage and upon establishment of the fact that such actual damage has taken place due to reasons directly attributable upon the Receiving Party. Such injunctive relief shall be in addition to any other remedies available hereunder, whether at law or equity. Disclosing Party shall be entitled to recover its cost and fees, including Advocate's fees, incurred in obtaining any such relief. Further, in the event of litigation relating to this Agreement, the prevailing party shall be entitled to recover its cost and expenses including Advocate's fees.

8. No Assignment

This Agreement shall not be assigned by the successful bidder, by operation of law or otherwise, without the prior written consent of ITI. This Agreement shall inure to the benefit of and will be binding upon the parties' respective successors and permitted assigns.

9. Severability

In the event that any of the provisions contained in this Agreement is found to be invalid, illegal or unenforceable in any respect by a Court of competent jurisdiction, the validity, legality, or enforceability of the remaining provisions contained in this agreement will not be in any way affected or impaired by such a finding.

10. Delay or Waiver

No delay or failure of either Party in exercising any right hereunder and no partial or single exercise thereof shall be deemed of itself to constitute a waiver or an

expectation of non-enforcement of such right or any other rights hereunder. No waiver of any provision of this Agreement shall be valid unless the same is in writing and signed by the party against whom such waiver is sought to be enforced. A waiver or consent given by either party on any one occasion is effective only in that instance and will not be construed as a bar to or waiver of any right on any other occasion.

11. Notices

Notices as required by this Agreement shall be sent to the Parties at the addresses mentioned first herein above or such other addresses as the Parties may designate from time to time, and shall be sent by certified or registered mail with acknowledgement due on receipt.

12. Term

This Term shall commence from the Effective Date of bid submission and shall be valid for 6 months. Confidentiality obligations under this Agreement shall continue to be binding and applicable without limit in point in time except and until such information enters the public domain, without breach of the agreement. Either Party may terminate this Agreement for breach, if the defaulting Party fails to rectify the breach within the one month notice period issued by the non-defaulting Party. Upon expiration or termination as contemplated herein the Receiving Party shall immediately cease any and all disclosures or uses of Confidential Information; and at the request of Disclosing Party, the Receiving Party shall promptly return or destroy all written, graphic or other tangible forms of the Confidential Information and all copies, abstracts, extracts, samples, notes or modules thereof.

13. Governing Law

The provisions of this Agreement shall be governed by the laws of India and shall be subject to the exclusive jurisdiction of courts in Mumbai.

14. Indemnity

The Receiving Party agree to indemnify and hold harmless the Disclosures against all costs, liability, losses and claims incurred by the Disclosing Party as a result of a breach of this Agreement.

15. Modification

Modification to any of the provisions of this Agreement shall be void unless it is writing and duly executed by Parties.

16. Headings

The headings given herein above are for ease of reference only and shall not attach or have any effect/ meaning whatsoever contrary to what is stated in the agreement.

17. Review of Contract and performance

ITI shall have the right of periodical /yearly review of the performance of the successful bidder with regard to upgradation of processors, memory and storage space and maintenance support under the contract which would be basis of continuation or termination of the same. ITI shall also have the right to review, either itself or through another agency as it may deem fit, the financial and operating performance of the bidder in order to assess the ability of the bidder to continue to meet its outsourcing/contractual obligations.

18. Proprietary Rights:

The entire work product mentioned in this RFI shall be the sole and exclusive property of the ITI. The successful bidder hereby-irrevocably grants, assigns, transfers to the ITI all rights, title and interest of any kind, in and to the work product produced under RFI contract. All information processed, stored, or transmitted by successful Bidder belongs to the ITI. The Bidder does not acquire implicit access rights to the information or rights to redistribute the information. The Bidder understands that civil, criminal, or administrative penalties may apply for failure to protect information appropriately. Any information considered sensitive by the ITI must be protected by the successful Bidder from unauthorized disclosure, modification or access. The ITI's decision will be final. The successful bidder will ensure strict compliance of all labour laws, insurance, minimum wages to the staff employed /deployed /engaged for the work assigned and the ITI will not be liable for any such persons/personnel of successful bidder and shall not be liable for any levies / penalties etc. that may be imposed by the authorities concerned for their action/inaction. There shall be no employer employee relationship whatsoever between the ITI and the successful bidder /their employees and the bidder or his employees, staff, agents will not be entitled to any employment with ITI. In the event of any demand/fines/penalty made by any of the authorities on ITI in respect of the conduct/actions taken by the bidder/their employees/labourers, the ITI will be entitled to recover the said amounts from the bills / amount payable or from the performance guarantee and also take appropriate action against said persons of bidder/bidder for their misconduct, if any.

19. Counterparts

This Agreement has been signed in duplicate, each of which shall be deemed to be an original. The exchange of a fully executed Agreement (in counterparts or otherwise) by fax shall be sufficient to bind the parties to the terms and conditions of this Agreement.

IN WITNESS WHEREOF THE PARTIES HERETO HAVE CAUSED THIS AGREEMENT TO BE EXECUTED BY THEIR AUTHORIZED REPRESENTATIVES ON THIS _____ DAY OF ____ ____ 2023

Signed and delivered by

M/s _____

Signed by:

Name

Title

in the presence of

Signed and delivered by

ITI LTD

Signed by:

Name

Title

in the presence of

Annexure D – Tentative Technical Specifications

1. **Communication Range:**

- a) **Single Hop.** The Radio should provide communication range of at least 20 Kms (in both Fixed Frequency (FF) & Frequency Hopping (FH) modes) in a single hop when RLOS is available, with antenna height of not more than 20m and data rates as mentioned at Para 9 below.
- b) **Repeater Mode.** The equipment should also be able to function as a repeater station providing communication link of at least 35 Kms (in both FF & FH modes) with antenna height of not more than 20m and data rates mentioned at Para 9 below.

2. **Frequency Range.** The equipment should operate in the entire frequency range from 4.4 to 5 GHz.

3. **Weight.** The weight of the Radio Relay equipment (Indoor Unit (IDU), Outdoor Unit (ODU), Power Supply Unit (PSU), Antenna (without mast section and alignment unit)) should be less than 40 Kgs. The IDU should be vehicle mountable and a vehicle mounting kit should be provided.

4. **Dimensions (Width x Depth x Height).**

- a. **IDU.** Not more than 500mm x 750mm x 500mm.
- b. **ODU.** Not more than 500mm x 500mm x 400mm.

5. **Operational Altitude.** The NHRR should be capable of operating upto an altitude of 5000m above mean sea level.

6. **Field Operating Temperature :** Details of Field Operating Temperature conditions are as follows:

- a. **Minimum Temperature :** Between minus 20 degrees Centigrade to minus 10 degrees Centigrade.
- b. **Maximum Temperature :** Between 40 degrees Centigrade to 45 degrees Centigrade

7. **Environmental Specifications :** The equipment will meet the following specifications:

- a. **ODU :** JSS 55555 Table L3 as applicable
- b. **IDU :** JSS 55555 Table L2B as applicable

8. **EMI/EMC.** The equipment must meet MIL Std 461 E or later.

9. **Data Throughput**

- a. 100 Mbps or more in Fixed Frequency (FF) mode (aggregate 200 Mbps or more).

- b. 8 Mbps or more in Frequency Hopping (FH) mode (aggregate 16 Mbps or more).
10. **Configuration.** The equipment must be modular in design and should be based on an Out Door Unit (ODU) and an In Door Unit (IDU) configuration as under :-
- a. ODU should encompass a Radio Unit mounted on the antenna. The antenna alignment should be possible both by using an electronically and manually controlled rotator. The control for the Rotator of the ODU and Antenna assembly must be feasible from the ground or from inside the shelter.
 - b. IDU to be placed in a Mobile or a Static shelter should provide various Base Band interfaces.
 - c. Data and power should be possible to be extended between the ODU and IDU over minimum 50 metres using any cable.
11. **Power Output.** The equipment should be configurable in multi power modes (atleast two power modes). The radio relay must offer Adaptive Power Control (APC).
12. **Receiver sensitivity.** The receiver sensitivity to be better than Minus 60 dBm at 100 Mbps throughput.
13. **FEC.** The NHRR should have built in FEC to be able to detect and correct channel BER of 10^{-3} or higher.
14. **ECCM.** The equipment should provide Frequency Hopping (FH) over the entire frequency range with a hop rate of at least 1000 hops per second. The equipment should also be able to provide Adaptive Frequency Control to suppress jamming effects and Adaptive Frequency Hopping to evade any jamming in FH mode.
15. **Base Band Interfaces.** The following interfaces will be supported on the IDU:-
- a. Atleast two 100 / 1000 Mbps Ethernet interfaces capable of providing 100 Mbps or better data rates with RJ 45 connector.
 - b. Atleast two G.703 electrical interfaces with data rates of 2 Mbps (E1).
 - c. Atleast two Optical Ethernet Interfaces.
 - d. Any other interface which assists additional functionality of the equipment.
 - e. 01 x Link Management System (LMS) interface.
16. **EOW.** A digital Engineering Order Wire (EOW) should be provided. EOW should have Industrial grade in-built secrecy with at least 128 bit encryption. It

should have a feature of selective calling to repeater station or terminal station when the link is connected in a repeater mode.

17. **Link Management System (LMS).** LMS to be provided along with non-malware certification of software. Further, the LMS must carry out the under mentioned functions :-

a. The following minimum details of a NHRR should be available and displayed accordingly using the LMS:-

i. **System Details.**

1. Radio Identifier (ID)
2. Own and distant radio ID Location.
3. Radio Type.
4. Mode.
5. Version.
6. Current Time.
7. Mac and IP Address.
8. Subnet Mask and Gateway Address.

ii. **Wireless System Details.**

1. Transmission Power.
2. Channel Frequency
3. Channel Size.
4. Wireless Security details.

iii. **Link Status.**

1. Subscriber IP and MAC Address.
2. Link Up Time.
3. Link Distance.
4. Link Operating Mode.
5. Transmission Power and Throughput Load

b. Control and Monitor radio parameters upto port level over LAN/ WAN.

c. Carry out Self-Testing and generate reports and logs.

18. **Semi-Ruggedized LMS Terminal.** To configure, troubleshoot and carry out link management of the NHRR, the LMS will be installed on the vendor supplied semiruggedized LMS terminal (Laptop configuration) with the following specifications:-

- a. Processor i5 (10th gen or better) / AMD Ryzen 7 or better.
- b. RAM 8 GB or more.
- c. Display Size 14 inch or more with resolution (1920 x 1080 HD or better).
- d. SSD 500 GB or Higher.
- e. Licensed OS compatible with LMS.
- f. Environmental Specifications – MIL STD 810G or better, as applicable.
- g. IP65 or better.

19. **Modes of Operation.**

- a. **Clear Mode.** Both data and control path in clear mode.
 - b. **Secure Mode (Industrial Grade Security).** 256 bit AES encryption algorithm for data over the radio link and 128 bit or better AES encryption algorithm for radio control path to be provided.
20. **Antenna Assembly.** This assembly should comprise of Antenna, Adaptor/ brackets, Mast sections, Antenna Mounting Unit and other ancillaries to make the antenna unit functional. Essential requirements to be met by the antenna system are given below :-
- a. Suitable Directional Antenna with variable RF transmission power be provided for point to point communication links to achieve the communication ranges and throughput as specified at Para 1 and 9 above.
 - b. Two types of Mast System should be provided having the following specifications:-
 - i. **Antenna Mast Type 1.**
 1. Detachable section based mechanical antenna assembly
 2. Mast system full height between 15 m to 20 m
 3. One section length 2 m or less
 4. Operational wind speed 80 km/hr or more with payload at maximum height.
 5. Survivable wind speed 120 km/h at maximum height.
 6. Weight of mast should be equal to or less than 150 kgs including accessories.
 - ii. **Antenna Mast Type 2 (Telescopic).**
 1. Weight of mast should be equal to or less than 150kgs including accessories.
 2. Antenna system should have a height not more than 20m when erected and height of 3m or less when retracted.
 3. The antenna mast assembly should be telescopic type. It should be possible to deploy mast sections to full height and part heights (less than 20m) both electro-mechanically and by a manual winch assembly system.
 4. Operational wind speed 80 km/hr or more with payload at maximum height.
 5. Survivable wind speed 120 km/h at maximum height.
 - c. Flexible feeder cables from IDU to ODU should be able to provide power for ODU, control for rotator/ tilter and carriage of baseband signals.
 - d. Electronic rotator/ tilter should be provided to rotate the antenna by at least +180° in horizontal plane and atleast +10° in vertical plane. It should also be possible to rotate the antenna manually.
 - e. The antenna should erect and retract fully while mounted on a vehicle based shelter.

- f. The weight of the Antenna Alignment unit should be less than 15 Kg.
21. **Power Supply.** The equipment should work on 24V or 48V DC power supply as well as 230V + 10%AC. Automatic changeover from AC to DC and vice versa must be provided.
22. **Safety Features.** Following safety features will be provided in the NHRR:-
- a. Must be protected against reverse voltage, should have fuses and other built-in safety devices.
 - b. Protection against the following:-
 - i. AC and DC over voltage and under Voltage.
 - ii. Surge from power and signal port.
 - iii. Surge protection from antenna sub sys.
 - c. Operation at high ground resistance (upto 8 Ohms) condition.

Maintainability & Ergonomic Parameters

23. **Colour.** Olive Green (Matte Finish).
24. **Repair and Maintenance.** Essential spare parts, tools and accessories for carrying out running repairs and maintenance of NHRR should be provided.
25. **Built In Test Equipment (BITE).** BITE supporting diagnostics should be provided. It should be able to trace a fault down to card level. It should be possible to carry out BITE through the LMS.
26. **Power On Self Test (POST).** Upon power on, the equipment should perform POST functions to determine the health status of the equipment. It should be possible to carry out POST through the LMS.
27. **Visual/ Aural Alarm Features.** Visual and Aural Alarms should be provided for self-test failure.
28. **Reliability.** The equipment should be capable of continuous operation for at least 72 hours on a single set basis without breakdown. Mean Time Between Failures should be at least 5000 hours.
29. **Service Life and Product Support.** The equipment should have a minimum Service life of 10 years. Life Cycle Support to be provided by the manufacturer.
30. **Remote Diagnostics.** NHRR should have in-built remote diagnostic facility. LMS should support remote diagnostics over an IP network. It should be possible to initiate the remote diagnostics feature after an authentication password. Complete software of NHRR should be restorable in field condition during maintenance with manual intervention.

31. **Carrying Cases.** The equipment (less Antenna Mast Type 2 (Telescopic)) alongwith all accessories should be man portable and to be packaged in separate ruggedized carrying cases. Carrying Harness for the antenna will be provided.