Establishment of Hybrid Communication circuits from North Atlantic Ocean to MOX-ISTRAC Bangalore (India) and SCC-ISTRAC Bangalore (India)

Request for Proposal

ISRO TELEMETRY TRACKING AND COMMAND NETWORK (ISTRAC)
INDIAN SPACE RESEARCH ORGANISATION
BANGALORE
INDIA

1.0 Introduction:

ISRO is planning for Gaganyaan G1 Mission (HSP), an unmanned mission from Sriharikota (SHAR) during March 2025. To support the mission, a ship in North Atlantic Ocean is planned to support TTC operations, Audio and Video operations of Crew.

Towards supporting this requirement, Hybrid Full Duplex Communication circuits need to be established between

a) Circuit 1: Ship in North Atlantic Ocean and MOX-ISTRAC Bangalore

b) Circuit 2: Ship in North Atlantic Ocean and SCC-ISTRAC Bangalore

2.0 Scope of Work:

2.1 Vendor to provide full duplex Hybrid communication circuits (combination of C-Band Satellite link and Managed L3 MPLS Link) with End to End throughput of Minimum 2 Mbps (excluding overheads). End to End Communication link implies entire link between Ship and MOX-ISTRAC & Ship and SCC-ISTRAC.

2.2 The Ship shall have two circuits; one to MOX-ISTRAC BANGALORE and another to SCC-ISTRAC BANGALORE. For more details on the Configuration of Hybrid links, refer Section 4.0.

2.3 Vendor to provide the dedicated Satellite Bandwidth for each Circuit from two different C-Band Satellites for ISTRAC-ISRO services from the Satellite Service Provider for the establishment of Satellite links from the Ship. This Bandwidth shall be used by ISTRAC throughout the Contract period as mentioned in Section 9.16. The C-Band Satellite Bandwidth required is to be provided by the Vendor achieving End to End throughput of Minimum 2 Mbps (excluding overheads) in Full Duplex mode.

2.4 Vendor shall obtain the Regulatory licenses for Uplink and Downlink for operating the links on the Satellite for the locations mentioned in Section 3.1 dedicated to ISTRAC-ISRO services from the corresponding Regulatory body. The details and Terms and Conditions are provided in Section 6.0.

2.5 <u>The arrangement of the Digital Satellite Modems at Teleports:</u>

2.5.1 The Make and the Model of Digital Satellite Modems at Ship is Comtech EF Data, CDM-625A. Hence, the Vendor shall arrange similar Digital Satellite Modems (Comtech EF Data, CDM-625A) at the Teleports for the compatibility.

2.5.2 If unavailability of the above Modem at the Teleport, Vendor shall collect the working Digital Satellite Modems from ISTRAC-Bangalore (two modems per circuit), send it to Teleports, Install and operationalize modems at Teleports and bring it back safely to ISTRAC after the completion/ termination of Contract.

2.5.3 Else if vendor cannot accommodate 2.5.1 and 2.5.2 and Teleport is having different Make and Model of Digital Satellite Modem, Vendor should provide Digital Satellite Modems at Ship with the same Make and Model of Digital Satellite Modem operating at Teleport during Integration of VSATs at the Ship. It is mandatory that Vendor should provide minimum two Nos of working Digital Satellite Modems per Circuit. Vendor should provide the Modems at Port of Integration, carryout Installation, testing, ensuring performance and operationalization of the Circuits.

2.5.4 In case of any issue in establishing the circuit, vendor has to resolve by providing suitable solution and establish stable connectivity.

2.6 The Vendor should have necessary coordination with the Satellite Service Providers, Teleport operators and OFC Service providers for, configuration of the Satellite Modems at Teleports, end to end link establishments, testing and verification of link performances, troubleshooting and resolution of any of the link issues due to Satellite, Interference, Teleport operations & failures, OFC segment issues & failures etc and as and when there are any of the link issues and link unavailability under the Scope of Work of the Vendor. Vendor shall be responsible for providing flawless End to End Communication links.

3.0 Location of Services:

3.1 The locations of Ship are as follows:

S No	Description of the Location	Latitude and Longitude of the Location OR Name of the location
3.1.1	North Atlantic Ocean Support location (The location of the ship provided here are tentative and may have little changes based on the Mission requirements).	North Atlantic Ocean Lat: 43 deg N; Long: 43 deg W.
3.1.2	List of Pool of Teleport-1 (for Circuit-1 at Ship)	1) Intelsat Teleport at Mountainside, USA 2) Intelsat Teleport at Napa, USA
3.1.3	List of Pool of Teleport-2 (for Circuit-2 at Ship)	1) Intelsat Teleport at Fuchssadt, Germany 2) Laurentides Tata teleport
3.1.4	Port of Integration of Ship (Near New York)	The exact location details shall be provided to the Vendor during PO placement.

3.2 The details of the locations of MOX-ISTRAC BANGALORE and SCC-ISTRAC BANGALORE are as follows:

3.2.1 The link Termination location by the Vendor at MOX-ISTRAC Bangalore is

Gaganyaan Technical Facility (GTF),

MOX-ISTRAC Office,

3rd Main, 2nd Phase, Peenya Industrial Area,

Peenya, Bangalore-560058

3.2.2 The link Termination location by the Vendor at SCC-ISTRAC Bangalore is

IDRSS Feeder Station Facility,

SCC-ISTRAC BANGALORE Office,

3rd Main, 2nd Phase, Peenya Industrial Area,

Peenya, Bangalore-560058

4.0 Configuration of Hybrid Communication circuits:

4.1 Each Hybrid Full Duplex Circuits shall be the combination of one C-Band Satellite link (one hop only) from Ship to Teleport and extended from Teleport to MOX-ISTRAC BANGALORE/ SCC-ISTRAC BANGALORE through Managed L3 MPLS link (established by Vendor) as per the following

configuration. Vendor to note that Teleports shall be selected from the list of pool of Teleports mentioned in 3.1.2 and 3.1.3 only.

4.1.1 Circuit 1 (From Ship to MOX-ISTRAC Bangalore):

SATCOM link: VSAT-1 at Ship to Teleport-1 through C-Band Satellite-1

OFC link: Teleport-1 to MOX-ISTRAC BANGALORE through Managed L3 MPLS circuits

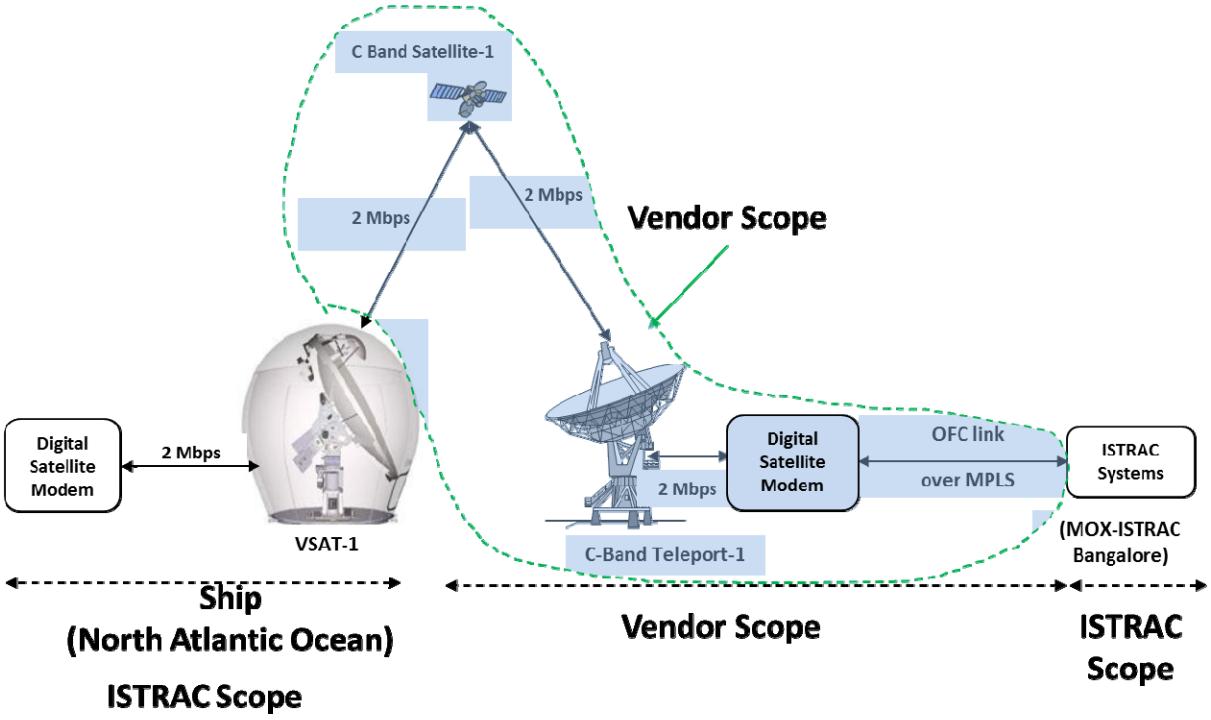
4.1.2 Circuit 2 (From Ship to SCC-ISTRAC Bangalore):

SATCOM link: VSAT-2 at Ship to Teleport-2 through C-Band Satellite-2

OFC link: Teleport-2 to SCC-ISTRAC BANGALORE through Managed L3 MPLS circuits

4.2 Schematic representation of the Hybrid Communication links

4.2.1 Circuit-1 (Hybrid Communication link from Ship to MOX-ISTRAC BANGALORE)



4.2.2 Circuit-2 (Hybrid Communication link from Ship to SCC-ISTRAC BANGALORE)

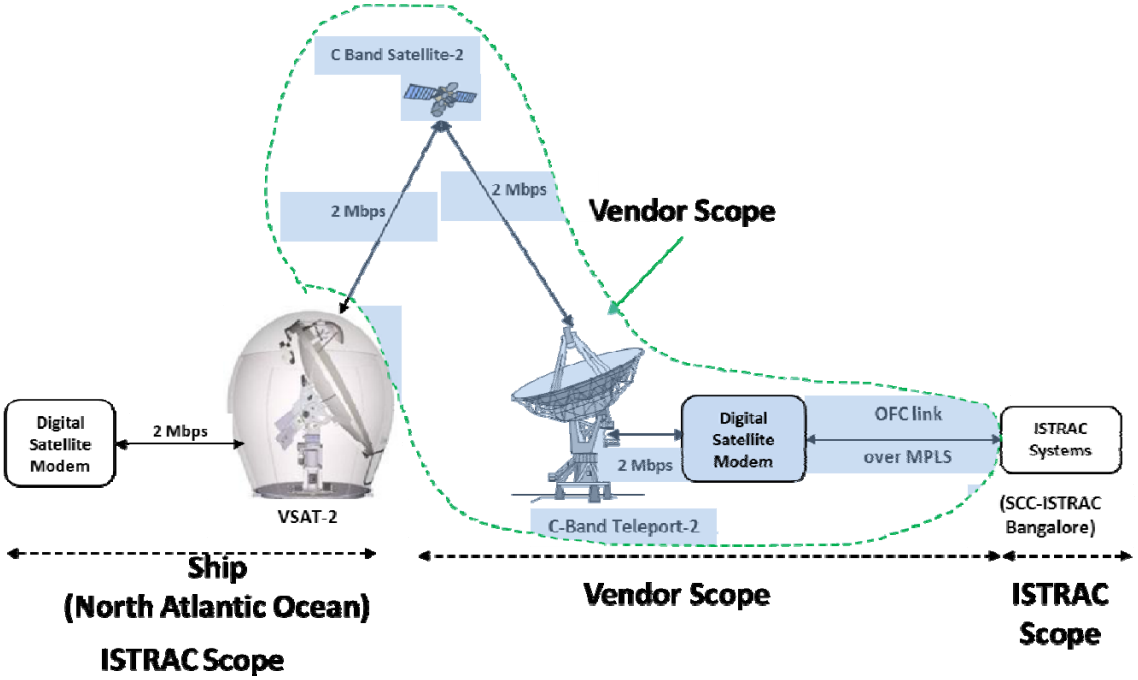


Table: 4.2 Nomenclature of each Circuit elements (End to End)

S.No	Circuit Description	Circuit ID	VSAT ID	Satellite ID	Teleport ID	Destination location at ISTRAC
1	Ship to MOX-ISTRAC BANGALORE	Circuit-1	VSAT-1	C-Band Satellite-1	Teleport-1	MOX-ISTRAC BANGALORE
2	Ship to SCC-ISTRAC BANGALORE	Circuit-2	VSAT-2	C-Band Satellite-2	Teleport-2	SCC-ISTRAC BANGALORE

4.3 Terms and conditions of Hybrid Circuits:

4.3.1 Vendor to ensure that no single point failure that makes both the links from Ship at North Atlantic Ocean to go down simultaneously.

4.3.2 Vendor should provide different Satellites for each Circuit from the Ship.

4.3.3 Vendor should provide different Teleport locations for each Circuit as per the pool of Teleports listed in Section 3.1.2 and 3.1.3.

4.3.4 From Teleports, each Satellite links shall be extended through different Managed L3 MPLS circuits to MOX-ISTRAC BANGALORE and SCC-ISTRAC BANGALORE. The addresses of OFC link termination locations at MOX-ISTRAC BANGALORE and SCC-ISTRAC BANGALORE are provided in section 3.2.

4.3.5 Vendor to note that the Ship support location provided in 3.1.1 is for G1 Mission. For the subsequent Missions, there may be slight difference in the Ship location with respect to G1 Mission. However, it will be intimated to the Vendor well in advance before the commencement of the Next Mission. Vendor has to take care of this difference (if any), and meet the requirements.

5.0 Technical Specifications of the Satellites:

S.No	Parameters	Specifications
1.	Orbit	Geosynchronous Orbit
2.	Type of Satellite Service	Fixed satellite service
3.	Satellite Foot print coverage	Circuit-1: Satellite shall have Footprint that cover North Atlantic Ship Support location as mentioned in 3.1.1, the corresponding Teleport location as mentioned in 3.1.2 and location of Port of Integration mentioned in 3.1.4. Circuit-2: Satellite shall have Footprint that cover North Atlantic Ship Support location as mentioned in 3.1.1, the corresponding Teleport location as mentioned in 3.1.3 and location of Port of Integration mentioned in 3.1.4.
4.	Type of Transponder	Bent pipe
5.	Frequency Band of Operation (C-Band)	Uplink Band: 5.850 GHz to 6.425 GHz
		Downlink Band: 3.625 GHz to 4.200 GHz
6.	Polarization	Linear or Circular
7.	Bandwidth	Vendor to provide the required C-Band Satellite Bandwidth for each Circuit to achieve the End to End throughput of Minimum 2 Mbps (excluding overheads).
8.	Downlink EIRP, G/T, Saturation Flux density, Intermodulation and Spurious of the Satellite	a) Details have to be provided by the Vendor as per link design. b) Vendor has to provide the Teleport Antenna RF parameters and link calculations taking care of Ship MVSAT parameters provided by ISTRAC. c) Vendor to note that these details shall be in compliance with the required Circuit Performances such as the required Link Margin, the required End to End throughput etc as mentioned in Section 5.3.

5.1 General Specifications

1.	The vendor shall provide the satellite name, parking slot, bandwidth availability, Polarization, EIRP, G/T. Foot print maps for each Circuit shall be separately and clearly provided showing ship support location with longitude & latitude information, Teleport location with longitude & latitude information and the Port of Integration location with longitude & latitude information. The offered satellite/s should be healthy and reliable in providing the communication support. Vendor shall ensure interference free environment in both satellite and ground segment.
2.	Vendor shall offer the C band transponder with suitable beams with stable footprint covering the given location of Ship with sufficient link margin as mentioned in Section 5.3. Link Budget calculations for all the Space segment usages are to be submitted along with the offer. The Technical details of the VSATs at Ship are provided in Table 5.2.
3.	The Teleports shall have the sufficient Infrastructure supporting Minimum 2 Mbps such as sufficient Antenna size, adequate Power sizing in Power Amplifier, EIRP and G/T etc to meet the required Eb/No, Link Margin and end to end throughput etc mentioned in Section 5.3.

4.	The provided Satellites shall have footprint in such a way that the Ship Support location mentioned in Section 3.1 shall be atleast 300 km internal from the Edge of the Satellite Footprint providing minimum 3 dB link margins throughout the coverage.
5.	The Teleport and OFC operations, links provided by the Vendor shall comply with High Security standards.
6.	Vendor shall provide the Telemetry Beacon frequency details of each Satellite for the optimization of look angles (Az and El) of Maritime VSAT Antenna throughout the Contract period.
7.	Vendor shall provide a suitable reference carrier in the allotted Satellites in the allotted Polarization (either from Teleport or from the Satellite) for each Satellite throughout the Mission period and as and when asked by ISTRAC for the optimization of Polarizer of Maritime VSATs at Ships. The required Setup shall be arranged by the Vendor for the transmission of reference carrier from Teleport or from Satellite.
8.	In case, if there is slight difference in the Ship location for the subsequent Missions support, Vendor should ensure adequate Satellite Footprint with the new location (if the existing hired Satellite footprint does not cover the new Ship location). The tentative new location co-ordinates for the Ship support location will be provided in advance.

5.2 Technical details of MVSATs at Ship (MVSATs are provided by ISTRAC-ISRO):

S.No	Parameters	Specifications of Ship MVSAT at North Atlantic Ocean
1.	Antenna size	2.2 m
2.	Maximum Power Sizing of the BUC	Terminal-1: 40 W (+46 dBm) Terminal-2: 40 W (+46 dBm)
3.	Maximum EIRP of the VSATs at Ships	53.3 dBW at 6.150 GHz for 40 W BUC
4.	G/T of the VSATs at Ships	19.6 dB/K at 3.95 GHz at 20 deg El Clear Sky
5.	Frequency Band of Operation (C-Band)	Uplink Band: 5.850 GHz to 6.425 GHz
		Downlink Band: 3.625 GHz to 4.200 GHz
6.	Polarization	Linear or Circular
7.	Minimum Elevation Angle from MVSAT towards Satellite	15 deg
8.	Make and Model of Digital Satellite Modem	Make: Comtech EF Data, Model: CDM625A

5.3 Baseband and Circuit Performance specifications

S.No	Parameters	Specifications	Remarks
1.	Digital Interface	a) Ethernet on RJ-45 connector (Modem at both Ship and Teleport side) b) Optical Handoff at ISTRAC side at the points of Termination of links	Vendor shall configure the Digital Interface at Teleport based on ISTRAC requirements.
2.	Required Link Margin at Clear Sky	Minimum 3 dB	Vendor to provide sufficient Link Margin needed to compensate Rain Attenuation at the locations mentioned in Section 3.1.
3.	Required Eb/No at both Ship and Teleports	The minimum Eb/No required to meet BER performance of $1x10^{-8}$ shall be maintained at both Ship and Teleports as per the BER specification of the Modems in the operating Modcod.	Vendor to ensure sufficient Link Margin as in Section 5.3 Point No 2 to meet the Required Eb/No at both Ship and Teleports to compensate for the Rain Attenuation.
4.	Clear Throughput (End to End)	Minimum 2 Mbps (excluding overheads)	Iperf test to be measured through UDP and TCP traffic. Vendor to note that this Throughput has to be achieved by the user data. Hence, Vendor shall provide adequate Satellite Bandwidth and OFC Bandwidth needed to meet this requirement end to end.
5.	One way Latency of the link (End to End)	800 ms maximum	Vendor to note that this total latency of the link is End to End from Ship to MOX-ISTRAC BANGALORE and Ship to SCC-ISTRAC BANGALORE that includes Satellite link, Teleport and OFC link till termination locations at ISTRAC.
6.	Jitter (End to End)	70 ms Maximum	Vendor to build low latency circuit and keep the latency as minimum as possible.
7.	Availability of the link (End to End)	99.5 % or better.	

6.0 Regulatory Licensing for Uplink and Downlink:

6.1 The Regulatory licenses for uplink and downlink shall be obtained by Vendor for operating the Satellite links at the Teleport locations as mentioned in section from 3.1.2 and 3.1.3 throughout the Contract period. In case of any delay in Mission, ISTRAC would renew the Contract period based on the Mission requirements. Vendor shall ensure the Regulatory Licenses for Uplink and Downlink for the extended period of the Contract.

6.2 The Regulatory licenses for uplink and downlink shall be obtained for 90 days, at Port of Integration (New York Port) during Integration and testing period, sailing and launch support for every Gaganyaan Mission within the Contract Period. The dates required for this licensing will be informed to the Vendor 20 days prior to the start date. In case of any delay in Mission, ISTRAC may ask for the extension of Regulatory Licenses for Uplink and Downlink.

7.0 Link Establishment, testing, Commissioning and Operations & Maintenance Support of Hybrid links:

Very important: This project is highly time critical and vendor should strictly adhere to the time schedule.

7.1 Vendor to provide the quote for both the Circuits.

7.2 The G1 Mission Support start date is tentatively: Mid of Mar-2025. Vendor to realize the Circuits within 6 weeks from the date of release of Purchase Order.

7.3 The Teleports shall be in RF Satellite loop towards MOX-ISTRAC BANGALORE & SCC-ISTRAC BANGALORE for testing and verification of the link performances by ISTRAC during the entire contract period except during the Mission Support.

7.4 ISTRAC will intimate the Vendor about the Ship availability at Port of Integration to establish the Circuits from Ship.

7.5 It is the responsibility of the Vendor to establish the circuits end to end in coordination with ISTRAC. During operational phase, in case of any change in the configuration, Vendor shall support for the configuration and testing.

7.6 After Establishment of end to end links, ISTRAC will verify the performance of the Hybrid circuits in compliance with the performance measures as mentioned in Section 5.3.

7.7 After Commissioning of Hybrid links from Ship, the links shall be under continuous monitoring by the Vendor and his Service Providers. In case of any link failures in any link segment reported by ISTRAC, Vendor shall acknowledge the ticket raised and necessary support shall be immediately provided by the Vendor for the restoration of the link to its full capacity and performances within the time as specified in 9.18.6 from the time of ticket raised. After this specified time, penalty will be applicable as per Section 9.18.6.

7.8 Vendor shall maintain logs of the Monitoring of each link segments and in case of any link issues during critical launch support period, i.e. from T-30 days to T+10 days, Vendor may be asked to provide the detailed critical logs of the performance of the links by ISTRAC.

8.0 OFC segment requirements:

8.1 The OFC links shall be configured for each full duplex circuit to ensure that the bandwidth is sufficient to meet the required throughput of Minimum 2 Mbps (excluding MPLS Overheads) End to End.

8.2 Vendor to note that the Last mile OFC circuits shall be on Ring Architecture or on redundancy for each Circuit to avoid any single point failures.

9.0 General Terms and conditions:

9.1 Vendor shall ensure that the offered solution is complete to meet the link requirements and meets all the specifications and terms & conditions mentioned in this tender.

9.2 Vendor to provide all IP details of the circuits after award of Contract to the Vendor. Vendor to note that all IPs provided shall be in Private IP range for ISRO Circuits.

9.3 Vendor to note that the Circuits must be through Private International Circuit and shall not be on Internet.

9.4 Vendor to note that the Hybrid Circuits must not inspect or block any traffic. No specific application ports should be blocked or have restriction end to end.

9.5 Vendor to note that the Managed OFC Network shall have low latency and low jitter with adequate multi-paths. If any submarine cable is cut, Vendor to provide the link through alternate path with low latency and low jitter considering ISTRAC Services at highest priority.

9.6 Vendor to note that the OFC circuits should not cross any region over China and Honkong.

9.7 Vendor to note that the End to End Communication link establishment shall be the responsibility of the Vendor in total and shall include all the necessary coordination in delivering the End to End circuitry flawlessly.

9.8 Downtime for a link is defined as outage which shall start at the trouble ticket is being opened by ISTRAC and end when ISTRAC closes the trouble ticket after satisfactory resolution.

9.9 Services unavailability doesn't include outages due to the following reasons:

9.9.1 Any outage due to ISTRAC provided Power or equipment.

9.9.2 Any outage attributable to Force Majeure Events.

9.9.3 Any planned outage maintenance activities such as switch over, software upgrade etc after the approval by ISTRAC.

9.9.4 Satellite links down due to Sun interference phenomenon and scintillation effects.

9.10 Critical period of launch support is from 30 days before launch to launch + 10 days. During this period, vendor should ensure that the communication links are free from any planned outage for maintenance activities. Also any unplanned outage should be responded and resolved fully within 30 minutes. Mission dates will be intimated to the vendor, one month prior to the launch by ISRO and further updates if any.

9.11 During Launch critical time period, vendor should ensure adequate resource allocations and appropriate configurations for achieving 100% availability. Vendor shall ensure positioning of technical manpower at critical locations (teleports, OFC landing points and network control centers) for monitoring of the links and fast resolution of any issue.

9.12 End to End escalation matrix has to be provided by the vendor with contact details after PO release. The Point of Contacts (POCs) details of ISTRAC will be shared.

9.13 Whenever there is a breakdown of the link, the vendor need to submit Root Cause Analysis (RCA) and Reason for Outage report against the ticket raised.

9.14 Vendor to note that the Service period starts from the date of acceptance of circuits by ISTRAC.

9.15 If Ship is not positioned at the defined location, the Acceptance may be based on the RF Satellite loop from Teleports towards MOX-ISTRAC BANGALORE and SCC-ISTRAC BANGALORE.

9.16 Vendor to note that the initial Contract period is for 1 Year from the date of Acceptance of the link by ISTRAC and ISTRAC shall have the right to renew the contract every 1 Year based on the Mission requirements. The validity of the terms and conditions of the Contract shall be upto 3 Years on the

same terms and conditions. Vendor to note that the extension of contract shall be intimated to the Vendor 2 months in advance.

9.17 Vendor to note that Counter terms for any of the RFP clause in this tender is not acceptable.

9.18 Payment terms:

9.18.1 The billing cycle starts after the Acceptance of the links by ISTRAC. The Service charges (Annexure clause No 1.2 and 2.2) will be paid at the end of the quarterly payment cycle after satisfactory completion of service duly certified by the Engineer-in-Charge and approved by Division Head of ISTRAC.

9.18.2 The One-time charges (Annexure clause No 1.1 and 2.1) are for one year. Vendor to note that the One-time charges will be paid along with the first quarterly payment in arrears after satisfactory completion of service duly certified by the Engineer-in-Charge and approved by Division Head of ISTRAC.

9.18.3 The charges mentioned in Annexure clause No 1.3 and 2.3 (as per the requirements mentioned in Section 6.2) will be paid in pro-rata basis along with the subsequent quarterly payment.

9.18.4 All invoices shall be addressed to Accounts Officer, ISTRAC by the Vendor on or after the billing cycle period. The contact details shall be provided along with the Purchase Order.

9.18.5 The Service Unavailability time will be calculated on monthly basis accumulated for quarter of a year. The Service unavailability credit will be adjusted against the Invoice and settled accordingly. The Service Unavailability formula is as follows:

Percentage of Service Unavailability = (Sum of all downtime in a month/ Total time per month) *100

9.18.6 Clauses for End to End Service Unavailability for each circuit

9.18.6.1 Availability below 99.5%

9.18.6.2 End to End Throughput not meeting the requirements as mentioned in section 5.3

9.18.6.3 The Penalty calculation:

Service level Credit 1-216 minutes: No Credit

217-480 minutes: 2% of MRC (Monthly Recurring charge)

481-1080 minutes: 5% of MRC

1081-1440 minutes: 10% of MRC

For each subsequent 24-hour period thereafter: 3% of MRC.

9.18.7 As per 9.18.6.3, payment reduction will be done in the corresponding quarterly billing cycle.

9.18.8 ISTRAC has the liability to terminate the Circuit anytime in the Contract period, if the performance of the circuit falls below 99% of availability and not satisfactory for 30 days.

9.19 Class of Services for MPLS OFC segment shall be considered highest class and 100% highest priority.

9.20 If required, during Technical Evaluation of the offers, Vendor shall provide for Technical presentation either physically or through online mode when asked by ISTRAC.

9.21 Vendor shall explore the possibility of upgradation of Hybrid links above 2 Mbps upto 5 Mbps, in case of any requirements.

9.22 Vendor shall note that the Gaganyaan mission support focuses on high standards and certification for Human Rated services. Hence, the offered solution should focus on priority, High security, adherence to mission-critical concerns, specifically ensuring highest availability and reliability in delivering the proposed communication services throughout the Contract period.

9.23 Vendor shall not breach the security and Integrity of ISRO Missions.

9.24 Vendor shall provide documentary evidence such as Purchase/ Contract copy and successful Work completion certificate from the user for having successfully established VSAT communication links or Broadcasting services via Satellite through Teleport, Teleport operations and mutual coordination with all Service Providers.

9.25 RFP is for establishing two communication links from ship to MOX-ISTRAC BANGALORE and ship to SCC-ISTRAC BANGALORE. However, at the time of ordering, ISTRAC reserves the right to Place Order on one of the links or both the links. Vendor shall clearly indicate the associated breakup costs for establishing individual link as per the Annexure.

9.26 Vendor shall note that their personnel will not be allowed on the ship to travel during sailing. Issue resolutions during sailing shall be done in coordination with ISTRAC personnel only.

9.27 The offer shall be complete in all respects so as to avoid need for further clarifications as the project is time critical and all technical aspects should be complied and substantiated with adequate documents. The vendor shall submit their offer as per the due date.

9.28 The tentative timeline for the Mission would be Mar 2025. The exact Timeline will be intimated during PO placement.

9.29 Vendor shall furnish the following details along with the offer: -

9.29.1 Compliance Matrix indicating the party's compliance to all the technical specifications, terms and conditions indicated in the RFP to be submitted along with this offer.

9.29.2 The vendor shall submit a technical solution offered with detailed write-ups towards establishing the Hybrid Links End to End in the technical bid, enclosing the Satellite Parameters, Link Budgeting, Teleport, OFC services etc.

10.0 Vendor Selection criteria (Criteria for L1):

10.1 Vendor to note that the Contract will be awarded only to the technically suitable lowest offer (L1) that complies with all technical specifications, Terms and conditions in this RFP.

10.2 The Criteria for L1 is as follows:

10.2.1 Vendor to note that L1 on each Circuit (C1, C2) will be considered independently.

10.2.2 ISTRAC reserves the right to place the order to different Vendors for the Circuits in the Ship separately.

10.2.3 Vendor Selection Criteria: A) Technically qualified L1 Vendor will be considered for the PO placement of first link (whosoever is less). B) Technically qualified L1 Vendor under Sl No A will not be considered for the selection of Second link, even if the Vendor is L1 in Second link. Next Lowest offer will be considered for Selection of Second link. However, vendor has to quote for both the Circuits.

10.2.4 In the event of only one technically qualified quote in both the Circuits of the Ship, then ISTRAC reserves the right that the Contract may be awarded to the Vendor for both the Circuits.

10.2.5 The lowest quote on Circuit/s shall consists of following in arriving at total cost of any circuit:

10.2.5.1 One-time cost for the End to End Link Establishment, Testing, Commissioning and Acceptance of links.

10.2.5.2 One year cost for obtaining the Satellite Bandwidth, Regulatory Licenses for Uplink and Downlink for Teleports, for availing Teleport Services, for availing OFC Services and for availing Operational Services etc.

10.2.5.3 Pro-rata Regulatory licensing charges (for 90 days each Mission) for operating C-Band Satellite Bandwidth at Port of Integration for every Mission over the Contract Period as per Section 6.2.

11.0 Information to all Vendors (Information only):

Currently OFC Service Providers available at MOX-ISTRAC BANGALORE:

1. TATA Communications
2. VODAFONE
3. AIRTEL
4. SIFY
5. BSNL
6. RAILTEL

Currently OFC Service Providers available at SCC-ISTRAC BANGALORE:

1. TATA Communications
2. VODAFONE
3. AIRTEL
4. BSNL
5. POWERGRID

Annexure

Sl No	Description	Quantity (In Lot)	Unit cost	Total cost
Circuit-1 (One-time charges, Inclusive of Taxes)				
1.1	Establishment, testing, commissioning and Acceptance of Circuit-1	1 Lot		
Circuit-1 (Recurring End to End Link Service charges, Inclusive of Taxes)				
1.2	C-Band Satellite-1 Bandwidth charges, Regulatory licensing charges for operating C-Band Satellite-1 Bandwidth at Teleport-1, Teleport-1 Service charges, OFC link service charges and Operational cost for the Contract period for one year	1 Lot		
Circuit-1 (Recurring Licensing charges, Inclusive of Taxes)				
1.3	Pro-rata Regulatory licensing charges (for 90 days each Mission) for operating C-Band Satellite-1 Bandwidth at Ports of Integration for every Mission over the Contract Period as per Section 6.2.	1 Lot		
Circuit-2 (One-time charges, Inclusive of Taxes)				
2.1	Establishment, testing, commissioning and Acceptance of Circuit-2	1 Lot		
Circuit-2 (Recurring End to End Link Service Charges, Inclusive of Taxes)				
2.2	C-Band Satellite-2 Bandwidth charges, Regulatory licensing charges for operating C-Band Satellite-2 Bandwidth at Teleport-2, Teleport-2 Service charges, OFC link service charges and Operational cost for the Contract period for one year	1 Lot		
Circuit-2 (Recurring Licensing charges, Inclusive of Taxes)				
2.3	Pro-rata Regulatory licensing charges (for 90 days each Mission) for operating C-Band Satellite-2 Bandwidth at Ports of Integration for every Mission over the Contract Period as per Section 6.2.	1 Lot		