Dear Sirs,

Please submit your sealed quotation, in the Tender Form enclosed here along with the descriptive catalogues/pamphlets/literature, superscribed with Our Ref. No. and Due Date for the supply of the following items as per the terms & conditions mentioned in Annexure (Form No: GIER 2018-000044-01).

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Description of Items with Specifications</th>
<th>Unit</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply, Onsite installation and Operationalisation on turn-key basis of IRNSS enabled multi-frequency GNSS reference station. Detailed Technical specification as per Annexure</td>
<td>Set</td>
<td>6</td>
</tr>
</tbody>
</table>

DELIVERY AT: IIRS, DEHRADUN

MODE OF DESPATCH ON SITE

DUTY EXEMPTIONS

SPECIAL INSTRUCTIONS TWO PART

SPECIFIC TERMS

ASHA CHANDRA L
PURCH. & STORES OFFICER
For and on behalf of the President of India
The Purchaser
Specific terms and conditions to the tender

1. Please submit the Technical Details / Catalogue / Make/ Model/Data Sheets.
2. The offer should be valid for a period of 90 days from the date of opening of Tender.
3. Please send the quotations ONLY in 'SEaled COVER' indicating our tender enquiry No. and due date by speed post so as to reach us on or before the due date & time. IIRS will not be responsible for any postal delays.
4. E-mail/fax quotations 'WILL NOT BE ACCEPTED'.
5. Please quote the percentage of GST applicable.
6. Our standard delivery term is FOR, IIRS. In case any vendor offers delivery term of Ex-works, Packing and Forwarding charges if any should be indicated separately either as a percentage of the quoted rate or as a Lump sum amount.
7. We are exempted from the payment of Customs Duty and necessary exemption certificate shall be issued upon request.
8. Payment Term: Payment will be made within 30 days from the date of receipt and acceptance of the item at our site for order value up to 2.00Lakhs. For order value above 2.0 Lakhs, 90% payment will be made within 30 days and 10% against submission of Performance Bank Guarantee for the warranty period (wherever warranty is applicable). The Performance Bank Guarantee should be valid for a period of 2 months beyond the completion of the warranty period.
9. For foreign orders our Standard Payment Term is Sight Draft.
10. Liquidated Damages – The delivery period quoted should be realistic. The delivery period so quoted and mentioned in the order is the essence of the order/contract. In case of delay in delivery of material as per the delivery schedule, Liquidated Damage @ 0.5% per week or part thereof on the undelivered portion subject to a maximum of 10% of the contract value shall be levied. Wherever, installation and commissioning is also involved, the supply will be deemed to have been completed only when the entire Stores is supplied, installed and accepted.
11. Security Deposit: - Wherever the offer value is Rs. 5.00 Lakhs or above, the successful tenderer should submit Security Deposit @ 10% of the order value by way of Bank Guarantee / FD Receipt. The Bank Guarantee shall be obtained from any Scheduled Bank on Rs.200/- Non Judicial Stamp Paper and should be valid beyond 2 months from the completion of all contractual obligations.
12. In order to avail of the benefits extended to by Govt. of India to the Micro and Small Sectors, please submit attested copy of the valid Entrepreneur Memorandum Part-II signed by the General Manager, District Industries Centre / Udyog Adhar / NSIC Registration Certification along with your offer.
13. If any bidder submits forged / false document along with the tender, offer of such vendors will be summarily rejected and such bidders will be blacklisted for all future tenders.

***

Purchase & Stores Officer
SPECIAL TERMS AND CONDITIONS FOR SUBMITTING TWO PART BID

1. This is a two part tender viz., Techno-Commercial Bid (consisting of Technical Specifications, Commercial terms & condition etc.) and Price Bid. Hence, quotation should be submitted in separate sealed covers super-scribing “Tender No. GIER 2018000044-01, Due on 13/07/2018 at 14.00 Hrs (Techno-Commercial Bid)” and “Tender No. GIER 2018000044-01, Due on 13/07/2018 at 14:00 Hrs (Price Bid)”

2. Both the sealed tenders (Techno commercial & Price bid) should be kept in one big cover super scrib ing Tender for IRNSS Enabled GNSS against Enquiry No GIER 2018000044-01, Due on 13/07/2018 at 14:00 Hrs and put in the Tender Box available in Purchase Division, IIRS or send by post or Courier within the due date and time prescribed.

3. The Techno-Commercial Bid should clearly indicate the technical details, scope of supply, payment terms, delivery terms, delivery period, taxes and duties, warranty, guarantee, security deposit, performance bank guarantee, etc. under separate heads. Please note that the price should NOT be indicated in the Techno-Commercial Bid

4. Tender forms can be purchased from Purchase & Store Section IIRS, Dehradun on all working days on payment of ₹ 573/- in the form of DD drawn in favor of Pay & Accounts Officer, IIRS Dehradun payable at Dehradun or can be downloaded from www.iirs.gov.in. When tender forms are downloaded, DD for ₹573/- drawn in favor of Pay & Accounts Officer, IIRS payable at Dehradun shall be attached with Technical Bid.

5. Only Techno-Commercial bid will be opened on the date of tender opening. The price Bids of those tenderers whose Techno-Commercial Bids are found to be meeting our specifications/ requirements will be opened. The bidders are allowed to attend the tender opening on the date and time of opening.

6. Late and Delayed Tenders will not be considered. Therefore, please ensure that your tender is posted well in time to reach us before the due date and time.

7. Fax/Email offers shall not be considered.

8. All the pages of your offer should be signed/initialed by competent authority and affixed with your company’s Seal.

9. **EMD of ₹ 1,80,000/-** to be submitted along with the Technical Bid in the form of Crossed Demand Draft drawn on any Nationalized / scheduled bank in favor of Pay & Accounts Officer, IIRS, payable at Dehradun. Quotation received without EMD will not be considered. The EMD of unsuccessful bidder will be returned after finalization of order.

[Purchase & Stores Officer]
Annexure-1: Detailed Technical specification for IRNSS enabled Geodetic GNSS receiver/Antenna and other accessories.

Technical Specifications for supply, onsite installation and operationalisation on turn-key basis of Multi-frequency GNSS reference station receiver, accessories with prime objective of crustal deformation and TEC anomaly study.

1. IRNSS enabled Multi-frequency GNSS reference station receivers- 6 unit
   All will be used for permanent station for continuous observation (CORS)
2. GNSS Choke ring antenna with DM element
   (For reference station) - 6 unit

Note: 1) All above units should be quoted as per the following specifications and required accessories as mentioned and otherwise necessary.

2) All optional items are to be quoted separately. In case of basic and advance modules (with all features) are to be quoted separately.

3) Total supply and installation will have to be carried out on turn-key basis and therefore, all the installation work (including civil and electrical connections for both GNSS), site selection as per IGS recommendations, testing, calibration, training, maintenance, warranty would be the responsibility of the vendor.

I. GNSS system and accessories

<table>
<thead>
<tr>
<th>S.No</th>
<th>Item / Equipment</th>
<th>Specifications</th>
</tr>
</thead>
</table>
| 1    | IRNSS enabled Geodetic GNSS Receiver | - The receiver shall have a minimum of 550 or more parallel channels capable of tracking NAVSTAR GPS, GLONASS, Bideou and Galileo constellations and Indian SBAS GAGAN, IRNSS signals.
   - Shall be capable of tracking code and phase measurements of all the frequencies of
     - GPS: L1, L2, L2C, L5
     - GLONASS: L1, L2
     - GALILEO: E1, E5a, E5b, E5a+b(Alt-BOC)
     - Bideou: L1 & L5
     - IRNSS: L5 & S-band (NavIC)*
     - SBAS: GAGAN
   - Shall be capable of fully independent code and Phase measurements.
   *The receiver should be capable of tracking IRNSS (NavIC) L5 and S-band signals. |
| 2    | GNSS Geodetic choke ring antenna with DM element and | GNSS Choke ring antenna with following sections (reference station):
   - Should equip with Dorne Margolin element. |
| Multipath reduction | The antenna should be with radome and should be separate from the GNSS receiver and could be mount over 9 feet concrete pillar on a high grade stainless steel mounting pin.  
- The antenna shall be capable of tracking Code and Phase measurements of all the frequencies of  
  - GPS: L1, L2, L2C, L5  
  - GLONASS: L1, L2  
  - GLONASS: L1, L5  
  - GALILEO: E1, E5a, E5b, E5a+b(Alt-BOC)  
  - IRNSS(NAVIC): L5  
  - S-band (upgradable free of cost as and when available)  
- SBAS: GAGAN  
- The antenna phase center variation with elevation angle (10-90 degree) shall not be greater than 1.0 mm.  
- The antenna shall possess multipath reduction capability mechanism. |

| 3 | Position performance | Static (long)  
- 3mm +/- 1ppm Horizontal or better  
- 5mm +/- 1ppm vertical or better  

Fast (Rapid) static  
- 5mm +/- 1ppm Horizontal or better  
- 10mm +/- 1ppm vertical or better |

| 4 | Data Collection Interval and sessions | Shall be capable of logging data at 50 Hz or more. should have user selectable sampling rates in the range of 0.02 sec. to 30 sec  
- Shall be capable of 5 parallel logging sessions |

| 5 | System interface | Configurable over a web browser by  
  - TCP/IP with RJ45 Ethernet connectivity and  
  - GSM/GPRS connectivity thru built-in/external router  
- Shall equip with display and/or control unit  
- Shall be configurable to remote monitoring and online data downloading capability  
- Receiver should have key display in the front panel. That should clearly explain power on conditions, battery status, satellite tracking status, data logging status, and should able to configure/set up the receiver using the press buttons provided in the front panel.  
- VSAT connectivity capability |

| 6 | Real time data transfer | System should be capable of real time data transfer through |
- TCP/IP with RJ45 Ethernet connectivity and
  - GSM/GPRS connectivity
- Necessary hardware and software should be supplied including appropriate battery back-up for real time data transfer.
- Vendor shall examine and implement best possible data transfer protocol from the proposed sites of reference stations. All data transfer cost during warranty period should be included in the offer.

### 7 Memory Capacity
- Embedded/internal/removable memory of minimum 8 GB capacity or more (industrial grade) and
- Detachable memory device with minimum 32 GB capacity of industrial grade

### 8 Temperature and humidity range for receiver and Antenna
- Receiver and antenna should comply with IP67 standards for water, dust and humidity proof.
- Operating temperature Range: -40° C to + 60° C
- Humidity: 100%

### 9 Power and Data ports/slots

<table>
<thead>
<tr>
<th>Power Ports</th>
<th>Data Ports</th>
</tr>
</thead>
</table>
| - Minimum two external physical power ports with automatic switching facility between A/C and D/C.  
  - A.C. mains supply adaptability  
  - Physical over-voltage protection and polarity protection (for DC).  
  - Receiver should capable to send appropriate power to external peripheral devices like Met Unit.  
  - Should capable of Power Over Ethernet (POE)  
  - Receiver should have internal batteries and could be charged from both AC and DC sources. | - Minimum 4 ports onboard  
  - USB port (Device/Client & Host x 1)  
  - Dedicated Ethernet port  
  - RS232 port  
  - Lemo  
  - Bluetooth  
  - Capability for data I/O using VSAT  
  - Receiver should capable to stream data to its memory from external peripheral device like Met Unit. |

### 10 Power requirements and Management
- Nominal 12V DC or better
- Automatic swapping between power sources without affecting data recording
- Must have a nominal power consumption of no
more than 5 Watt with 230 V AC and also with external battery voltage ranging from 10 – 16 volts DC.
- When power source is removed the receiver must automatically switch to the next best power source available without effect on being stored.
- Automatic power on and data logging after power failure with same configuration (shall not restore to factory defaults).
- External battery bank (industrial grade) shall be provided with a capacity to run the system (receiver, met sensor and communication device) for minimum period of 7 days continuously in case of AC power failure.
- External battery shall be provided with an AC charger (industrial grade)
- The whole system (including communication system) should be capable to work standalone under zero A/C power condition
- Vendors are required to provide power calculation sheet to assess power requirement.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Details</th>
</tr>
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<tbody>
<tr>
<td>11</td>
<td>Surge and lightning protector</td>
<td>The system shall equip with DC-lightning arrester</td>
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<tr>
<td></td>
<td></td>
<td>EMP Protector/surge arrester &amp; capsule Kit (GNSS antenna)</td>
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<tr>
<td>12</td>
<td>Met Package interface</td>
<td>Capability for remote monitoring, configuring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>through receiver via web interface</td>
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<tr>
<td></td>
<td></td>
<td>Receiver should support met package from multiple vendors</td>
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<td></td>
<td></td>
<td>Receiver automatically stores met data in a file</td>
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<tr>
<td></td>
<td></td>
<td>and produces separately as required and the data</td>
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<td></td>
<td></td>
<td>should be in the IGS compatible Rinex format</td>
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<td></td>
<td>Preferably it should have single cable connectivity</td>
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<tr>
<td></td>
<td></td>
<td>from GNSS receiver to sensor</td>
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</tbody>
</table>

**Accessories**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Details</th>
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<tbody>
<tr>
<td>1</td>
<td>Centering device to mount antenna</td>
<td>Forced centering device for accurate centering of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>antenna over the station point</td>
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<tr>
<td>2</td>
<td>Antenna Cables</td>
<td>Shall be professionally made, all joints sealed and caps provided for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>connectors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antenna cable with 30 meters length without amplifier for Geodetic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>base station (CORS).</td>
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<tr>
<td></td>
<td></td>
<td>Separate cable of appropriate length for campaign</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mode operation.</td>
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<tr>
<td>3</td>
<td>Housing for the Receiver and</td>
<td>Shall be antistatic, weather proof, steel housing for</td>
</tr>
<tr>
<td></td>
<td>accessories</td>
<td>keeping the receiver and accessories. Should provide easy carrying</td>
</tr>
<tr>
<td></td>
<td></td>
<td>suitcase for the campaign</td>
</tr>
</tbody>
</table>
### II. Warranty, Comprehensive annual maintenance, Training and system demonstration

<table>
<thead>
<tr>
<th></th>
<th>Warranty Agreement</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
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<tr>
<td></td>
<td>Comprehensive onsite warranty for 3 years time frame shall be provided from the date of successful onsite system installation.</td>
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<td></td>
<td>Warranty shall cover 24x7 technical support, all spare parts and labour charges</td>
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<td></td>
<td>Warranty shall include both firmware and software upgrades</td>
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<td></td>
<td>Onsite maintenance and servicing shall be provided</td>
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<td></td>
<td>In case lab tests are required to be done, transport, insurance and handling charges shall be borne by the supplier</td>
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<td></td>
<td>The turnaround time (TAT) for repairs shall not be more than 72 hrs from the time of reporting</td>
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<td></td>
<td>A replacement unit shall be made available, at free of cost for the period, if break downs occur.</td>
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<td></td>
<td>Defective components must be replaced by similar make and model or higher quality components.</td>
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<td></td>
<td>Detailed warranty agreement shall be enclosed with their technical quote fulfilling the above requirements.</td>
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<tr>
<th></th>
<th>Comprehensive Annual maintenance contract</th>
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<tbody>
<tr>
<td>2</td>
<td></td>
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<tr>
<td></td>
<td>The vendors shall provide the extended annual maintenance contract for 4th and 5th years separately to cover GNSS equipment, hardware and software upgrades after completion of the initial three year comprehensive warranty.</td>
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<tr>
<td></td>
<td>The extended maintenance contract shall comply with the terms and conditions of the warranty and Maintenance agreement specified above. 4th and 5th years CAMC charges will be considered for arriving L1.</td>
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<tr>
<th></th>
<th>Spare Parts</th>
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<tr>
<td>3</td>
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<tr>
<td></td>
<td>All the spares shall be available for a minimum of five (5) years of operation from purchase</td>
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<tr>
<td></td>
<td>A list of recommended spares for receiver, antenna, flash card, rechargeable battery (for receiver) etc. should be given with price. Technical bid should contain list without price.</td>
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<tr>
<th></th>
<th>Training and data processing</th>
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<tr>
<td>4</td>
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<tr>
<td></td>
<td>Comprehensive training shall be conducted for on Geodetic GNSS Receiver usage and post processing software functions at IIRS, Dehradun</td>
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<td></td>
<td>A detailed training plan shall be provided before training commences.</td>
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</tbody>
</table>
Data processing shall be carried out to compute the precise coordinates of the above stations in ITRF frame by post processing the data using scientific processing software (Bernese/GAMIT).

- Special emphasis to be given on GNSS system monitoring (through system/server at IIRS), real time and post processing of data for deformation measurement and TEC analysis.

5 System demonstration

- The bidder should demonstrate the quoted system at IIRS, Dehradun to confirm the above specifications.
- System demonstration is mandatory. In case the bidder fails to demonstrate the quoted system, the offer will be treated as disqualified.

6 General conditions

- The offer should provide all critical specifications of the equipments, which would have a bearing on the performance of all overall system.
- It should clearly mention whether all system level specifications will be met with or without including optional items in the list of deliverables. Full or partial compliance of different specifications must be mentioned.
- The offer should clearly mention about time-line for delivery, installation and operationalisation.
- All other items, if any, which are essential for end to end working of the system, but not included in the offer, should be clearly brought out.
- The offer should give details of agencies to which such equipments have been supplied with their past and current performance duly certified by the user.
- Weekly backup of data from installed sites.

III. Power system

1 Solar Power System

- Solar Panel –2 nos., 40 W each capacity with mounting system in steel
- Solar Battery –2 nos., 12 volt, 100 Ah each
- Equipment enclosure with ventilators, brackets and cables
- Solar controller/ Battery charger
- Surge arrester
- Installation and configuration of the solar power system with the above GNSS system
- Additional solar power system and battery requirement with back up may be suggested exclusively for data transmission purpose. In case it can be integrated with Solar power system of GNSS receiver, then it must be quoted with suitable similar or higher (than as given above) capacity system.
IV) Other supportive services

<table>
<thead>
<tr>
<th>a.</th>
<th>Construction of survey monument</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• A circular concrete pillar of 2 feet Dia and 9 feet height above the ground on a firm ground and a concrete roofed hut to keep the sensor housing box shall be constructed as per the standard GNSS reference station with steel doors, lock and key system.</td>
</tr>
<tr>
<td></td>
<td>• The monument should be of ultra-stable design, should be on stable ground, should have clear horizon with minimum obstruction above 5 degree elevation, should avoid nearby high voltage power line and heavy human induced vibration/vehicular traffic and it should have general protection by appropriate fencing and burying of cable.</td>
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<tr>
<td></td>
<td>• In the warranty period if the monument is found unsuitable, then it must be relocated at vendors cost.</td>
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<tr>
<td></td>
<td>• Cabling should be preferably through under-ground pipes and entire area should be appropriately fenced with gate.</td>
</tr>
</tbody>
</table>

The following are the tentative locations, where the above specified Geodetic GNSS Receiver need to be installed. However, the locations may be changed in the same region based on the project requirements. After finalization of order, during initial visit to site, the vendor will collect data for at least 24 hrs to assess the quality of the site.

1. Central university of Himachal Pradesh
   Kangra, Shahpur, HP-176206

2. Semi-Conductor Laboratory,
   DOS, GOI, Sector-73, Chandigarh, Punjab-160071

3. Indian Institute of Technology Mandi,
   Mandi, HP-175005

4. Govt. Inter College, Pokhara
   Pauri Garhwal Uttarakhand-246169

5. Bharat Heavy Electricals Limited,
   Haridwar, Uttarakhand-249403

6. Public works department,
   Paonta Sahib, HP-173025