

**MoES PROJECT ON
SEISMIC NETWORK IN KUMAUN HIMALAYA**
CENTRE OF ADVANCED STUDY IN GEOLOGY, KUMAUN UNIVERSITY
THE DURHAM, NAINITAL, UTTARAKHAND, INDIA, 263 002

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Principal Investigator



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Dated: 17-08-2020

TENDER NOTICE

Sealed tenders are invited for BROADBAND SEISMOGRAPHS (Including Sensor, Recorder and required accessories) to be installed in the Kumaun Himalaya, under a MoES project from sole manufacturer or their authorized distributors. The tender form with specifications, terms and conditions can be downloaded from the University website www.kunainital.ac.in. The duly completed form along with the application fee, a Demand Draft (DD) of US \$ 20 or Rs. **1,500.00** (Rupees One thousand five hundred only) inclusive of GST in the name of Assistant Account Officer (AAO) must be attached with the form. Earnest money of Rs. **1,92,000.00** (Rupees one lakh ninety-two thousand only) or US\$ **2710** by Demand Draft (DD)/Bank Guarantee will have to be deposited with the tender, drawn in favor of A.A.O. DSB Campus, Kumaun University, Nainital, Uttarakhand- 263002. The duly completed bids should reach the office of the undersigned latest by 17th September, 2020.

Principal Investigator
MoES Project on SNKH

TENDER DOCUMENT

MoES PROJECT ON SEISMIC NETWORK IN KUMAUN HIMALAYA (SNKH)
DEPARTMENT OF GEOLOGY, CAS, KUMAUN UNIVERSITY, NAINITAL-263002

Bid reference: KU/DG/MoES (SNKH)

- (1) Manufacture's/Supplier's Name
And full address

- (2) Tender fee (non-refundable)
(DD No. and date)
In favor of Assistant Account Officer
Kumaun University, Nainital

- (3) Earnest money
(DD No. and date)
In favor of Assistant Account Officer
Kumaun University, Nainital

- (4) Signature of the Bidder/ Supplier
Date

Note: (i) Each page of the tender document must be signed
(ii) The documents contain nine pages marked 1-9

Sealed Tenders are invited for Broadband Seismographs including Sensor, Recorder and required accessories. (Annexure-I) to be installed in Kumaun Himalaya under the MoES sponsored project entitled “ Seismic Network in Kumaun Himalaya” under Prof. Rajeev Upadhyay, Department of Geology, CAS, Kumaun University, Nainital, from sole manufactures or their authorized distributors. The time schedule of the procurement is as follows.

(a) Bid reference KU/DG/MoES- This should be referred in all correspondence and also on the top of the envelope containing bid etc.

(b) Price of the bidding document (nonrefundable):

- (c) Commencement of sale of bids : 17th August, 2020
- (d) Last date of submission of bids : 17th September, 2020
- (e) Date and time of opening of technical bids : will be communicated later on
- (f) Evaluation of technical bids : will be communicated later on
- (g) Commercial bid opening : will be communicated later on
- (h) Place of opening of bids : Department of Geology, D.S.B
Campus, Kumaun University, Nainital
- (i) Address of Communication : Principal Investigator
MoES Project on SNKH
Department of Geology, CAS,
D.S.B. Campus,
Kumaun University, Nainital

1. GENERAL CONDITIONS

- (1.1)** The bids are to be submitted in two parts separately-
 - (i) Technical
 - (ii) Commercial bids in separate sealed covers enclosed in a sealed packet. The envelope containing the bid should be clearly marked on the top.
- (1.2)** The bids must be accompanied by earnest money in the form of a Demand Draft in favor of Assistant Account Officer, Kumaun University, and Nainital. Unsuccessful bidder's security money will be returned as early as possible. No interest will be paid on the security money.
- (1.3)** Bids will be opened in the presence of a committee and interested bidders may also attend the meeting at the specified date and time at their own.
- (1.4)** Price of the goods should be quoted on CIF New Delhi, India.
- (1.5)** Price quote shall be either in the currency of bidder's own country or in **US\$**.
- (1.6)** If a foreign bidder has engaged an Indian agent, it will required to give the following details in their offer-
 - (i) Name and address of the Indian agent
 - (ii) Services to be rendered by the agent
 - (iii) The amount of remuneration for the agent included in the offer
- (1.7)** The documentary evidence of the bidder's qualification to perform the contract, if its bid is accepted regarding his financial, technical and production capabilities necessary to perform the contract should be specified properly to the purchaser's satisfaction.
- (1.8)** Documentary evidence to the jobs and services eligibility shall consist of a statement in the price schedule on the country of origin of goods and services, which shall be confirmed by a certificate of origin at the time of shipment.
- (1.9)** The documentary evidence of goods and services conformity to the bidding document may be in the form of literature drawing and date and shall furnish a details discussion of goods essential technical and performance characteristics.
- (1.10)** The validity of bids should be for a minimum of 120 days.
- (1.11)** The expected date of delivery of goods after the award of the contract should be mentioned in the bid.
- (1.12)** Bids received after the deadline of submission of bids will be rejected.
- (1.13)** Bids should be submitted with the authorized signature and stamped duly in each page of the bid document.
- (1.14)** User's list indicating type of the equipment purchased by them and relevant certificate be enclosed.
- (1.15)** The equipment's to be procured in the project are to be installed at remote stations and necessary fields testing/ performance will have to be undertaken by the bidder
- (1.16)** Besides the term and conditions mentioned herein the import rules as applied by the Government of India will be applicable and in the event of any dispute the jurisdiction shall be the High Court of Uttarakhand at Nainital.
- (1.17)** The bidder is expected to examine all instruments, terms and specifications as given in the bidding document including those given in annexure-1. Failure to furnish all information required in the viding document of submission of a bid not substantially responsive to the bidding documents in every respect will be at the Bidder's risk and may result in rejection of its bid.
- (1.18)** The Principal Investigator reserves the right to accept or reject any of all the tenders without assigning any reason.

2. SEISMIC EQUIPMENTS AND ITS SPECIFICATIONS

2.1 Scope of the project: The scope of the work under the subject proposal includes:

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| 1. | Broadband seismometer (6 nos.) |
| 2. | Data Acquisition System (DAS) and its accessories (6nos.) |
| 3. | Solar Panel (200Watts), Solar Charge Controller, mounting rod and its accessories (6 nos.) |
| 4. | Batteries Indigenous/Local available (each of rating 12V 100AH) (6 nos.) |
| 5. | Battery Charger Indigenous/Local available (6 nos.) |
| 6. | Application software – 1no. |
| 7. | Spares – 1 lot |
| 8. | Delivery, Installation and Commissioning |
| 9. | Two year warranty from the date of acceptance |
| 10. | Electrical Earthing and Lightening arrestor at each site |

2.2 Broadband Seismometer (6 nos.):

The broadband seismograph system is required for studies in different environment (rocky as well as alluvial) in the field for earthquake/ aftershock/ swarm monitoring as required from time to time.

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| 1. | Type | Triaxial electronic force balanced Broadband type velocity transducer in a single sealed module. Axial accuracy of <0.5 degree. All the components should be permanently mounted in a single water tight, vacuum tight enclosure within the specified relative orientation |
| 2. | Feedback | Force balance with capacitive transducer. |
| 3. | Mass Centering/ Mass locking | a) Automatic or on external command locally or from remote and No mass centering within +/-45 degree C b) Automatic mass locking facility during transportation |
| 4. | Leveling Indicator | Integrated bubble leveling |
| 5. | Frequency Response | Flat (within ± 3 dB) to ground velocity, at least in the range of 120 sec to 50 Hz |
| 6. | Sensitivity | Minimum 1000 v/m/s |
| 7. | Dynamic range | Minimum 130 dB |
| 8. | Damping | 0.7 Critical. |
| 9. | Clip Level | Better than 10 mm/s from 0.1 Hz to 10 Hz |
| 10. | Output Voltage | ± 20 V peak to peak or more to match with input of digitizer (DAS) |
| 11. | Mass Position | Three independent voltage outputs |
| 12. | Calibration | Calibration facility from Das Acquisition System (DAS) |
| 13. | Power | Less than 2 Watts and derived from the DAS |
| 14. | Reverse Voltage protection | Included |
| 15. | Connector | Suitable to Digitizer, Water Proof and Rust proof |
| 16. | Operating temperature | -10 to +50 Degree C |

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| 17. | Humidity | 0 to 100% RH |
| 18. | Seismometer Cable | High Quality 10 meter cable with the end connector with low noise cable |
| 19. | Thermal Insulation | The Seismometer Manufacture should supply the seismometer PVC Molded Thermal Insulation cover to avoid the temperature variations |
| 20. | Past Experience | The firm should have supplied similar seismometer during past 2 years in India to reputed Institute or University. Attach the proof of documents |
| 21. | Linearity | +/- 1% of full scale |
| 22. | Frequency response curve and system information | Frequency and phase response curve of the unit along with information regarding transfer function including poles and zeros should be provided as per serial number of each sensor |
| 23. | Electronic self-noise | Must be below the USGS Low Noise Model over 20 sec to 5Hz range |
| 24. | Housing of instrument | The Equipment are to be placed in a hut/covered. The sensor should be covered properly |

Note: Noise level, distortion and linearity may be mentioned.

2.3 Data Acquisition System (DAS) (6 nos.):

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| 1. | Number of Channel | 3 Channels upgradable to 6 channels in a single unit |
| 2. | State of Health Channels | Provision for checking state of health information like sensor mass position, temperature, voltage, condition of GPS time lock etc., Locally or remotely. |
| 3. | Hardware | User Selectable with various Gain option. |
| 4. | Sampling rate | User Selectable up to at least 200 SPS per channel in different streams both in continuous and trigger modes simultaneously or in one mode as the case may be. |
| 5. | ADC resolution | 24 bit independent digitizer for each channel. |
| 6. | Channel to channel skew | a) Zero- Simultaneous sampling of all channels. b) Immune to electromagnetic interference. |
| 7. | System noise | Not more than 3 counts of 24 bit |
| 8. | Filter | Linear phase digital FIR filter |
| 9. | Dynamic Range | 135 dB @ 100 sps or better test report should be enclosed with the technical proposal. |
| 10. | Data Acquisition Mode | Continuous/ Trigger mode |
| 11. | Input range | Match with the all sensor output |
| 12. | Sensor Calibration and mass position Monitoring/ Centering | Digitizer should have the facility to send the signal to Seismometer to do the calibration and also it should have the facility to do the sensor mass position, mass centering, etc. |
| 13. | Common Mode Rejection | Better than 70dB |
| 14. | RAM | At least 16 MB RAM |
| 15. | Storage Type | Hard disk or Compact Flash (CF) memory card of 32GB or more. |
| 16. | Recording format | The data should be available in miniSEED, SEISAN, ASCII |

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| | | format while download the data from the storage Media through USB, Card reader or IP. |
| 17. | GPS timing system | <ul style="list-style-type: none"> a) GPS receiver electronic circuit should be inside the DAS to avoid the temperature variation with UTC timed with digitally controlled precision VCOX clock phase locked to GPS. b) Time accuracy less than 0.1 mSec when GPS is locked c) Free running TCXO accuracy of 1 ppm over wide temperature range. Antenna exposed to outer side. Antenna cable length should be minimum 10 meters d) Antenna enclosed in water tight and work effectively in extreme climate condition e) Antenna mounting rod and its accessories f) The antenna cable should withstand harsh weather conditions |
| 18. | Sensor Control | <ul style="list-style-type: none"> a) Sensor calibration facility for BB seismometer b) Sensor mass position monitoring for BB seismometer c) Sensor mass centering on command for BB seismometer d) Automatic re-centering while the seismometer deviates from the center position and exceeds the threshold value |
| 19. | State of Health of each channel | Provision for checking state of health information like sensor mass position, temperature voltage, condition of GPS time lock etc. locally and remotely. |
| 20. | Gain | Hardware gain selection through software for 0.5, 1, 2 and 4 |
| 21. | Trigger | User selectable, independently for each channel at different sampling rate based on triggering criteria as STA/LTA level etc. |
| 22. | V-SAT connectivity | <p>The DAS should support:</p> <ul style="list-style-type: none"> a) Ethernet port (10/100 Base-T) supporting TCP/IP and UDP/IP b) Compression of data before transferring to V-SAT c) Continuous and trigger or both d) Duplex communication between field and hubs e) Extensive error correction f) Support for off-the-shelf communication equipment |
| 23. | Power supply | <ul style="list-style-type: none"> a) Supply voltage 10-15 volts through solar panel activated maintenance free batteries. b) Power consumption of DAS less than 6 watt at 12 volt in data acquisition mode including the storage media. c) Lower battery voltage protection d) DAS shall resume data acquisition and transmission automatically when power is restored. |

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| 24. | Communication | <p>a) In built communication interface circuitry for provision of remote data acquisition and State-of-Health in near real time mode through V-SAT</p> <p>b) Suitable interface for computer/laptop for parameter setting and data downloading</p> |
| 25. | Housing | GPS and DAS modules should be enclosed in weather and shock proof sealed enclosures with lightening protection. |
| 26. | System Environment | <p>All outdoor equipment's should work in harsh weather conditions with following</p> <p>a) Temperature range -10 to +50 degree C</p> <p>b) Humidity up to 100% RH</p> <p>c) No provision will be provided to keep the remote station seismic equipment's indoor/ air conditioning room</p> |
| 27. | Display | Display indicator status to view power, GPS, data size etc. |
| 28. | Cables | <p>The supplier should supply</p> <p>a) 10 meter power cable with end connector</p> <p>b) IP cable with end connector</p> <p>c) Seismometer cable with end connector</p> <p>d) 15 meter GPS cable with end connector</p> <p>e) Other necessary cable to connect digitizer to V-SAT</p> |
| 29. | Spare Storage Media | With each digitizer the supplier should supply one spare storage media as per the above storage specification or more |
| 30. | Firmware updation | Firm should provide all the update of firmware at free of cost at least for five years from the date of acceptance of the system |
| 31. | Solar Panel and other accessories | <p>a) Solar Panel with appropriate solar charge controller for charging a battery of 12V 100AH. Installation of Solar Panels is the responsibility of the Bidder</p> <p>b) All outside exposed cables between solar panels and solar charge controller should pass through good ducting pipe</p> <p>c) Suitable solar panel with each digitizer and battery with indicator, 10 AMPS charge controller, cable to connect the solar charge controller and battery, Solar panel mount, all installation kit, bolt and nuts etc.</p> <p>d) With each digitizer to run the seismometer equipment's at field at least 7 days without any sunlight.</p> |
| 32. | Data Retrieval Software | The supplier should provide the data retrieval software to download data either from remote site or the storage media through as per the format required by the user. |

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| 33. | Data processing and other Utility software | <ul style="list-style-type: none"> a) Application software utilities for parameter setting, On-site control panel, sensor calibration, data retrieval into the field computer b) Downloading of data as per user criteria from field to central site through GPRS modem/VSAT (if connected) c) Provision to convert the data into SEISAN, ASCII, miniSEED, and other standard formats. |
| 34. | Earthing and Grounding | During the installation the equipment's should be grounded properly to avoid the electrical noise and arrest the lightning also. In addition, the Earthing/grounding for solar panel should be implement separately. |

2.4 Other Conditions:

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| 1. | Additional Condition | In case if the system failed during the warranty period them the local representative should provide the stand by system to University within a week time to avoid the data loss |
| 2. | Qualification criteria | <ul style="list-style-type: none"> a) The product should have been installed in India and it should be in a working condition. b) The user contacts details should be provided with installation along with installation certificate to be enclosed with the technical proposal. c) Minimum two customer satisfaction certificates to be attached. |
| 3. | Warranty | <ul style="list-style-type: none"> a) The successful bidder must own a full warranty of all hardware and software as per terms and conditions for a period of two year after commissioning of equipment's. b) During the warranty period, the bidder must respond within 10 days without any cost to Kumaun University, Nainital for service and correct the problem. The warranty period will be extended proportionally if the down period is beyond 10 Days |
| 4. | Training | <ul style="list-style-type: none"> a) Operational/maintenance training at Department of Geology, Kumaun University, Nainital for a period of 2-3 working days for the project officials b) During the training period installation and maintenance of seismic station, application and operating software should be demonstrated c) A detailed training plan about the topics to be covered in the training shall be submitted by the bidder |

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| 5. | Final acceptance Test | <ul style="list-style-type: none"> a) The testing should be done for all the equipment's supplied. All individual components should be sufficiently tested prior to shipment and checked for completeness of the specification quoted b) The bidder should successfully demonstrate the performance of all the equipment's after supply as per our tender specification c) The successful bidder must integrate, install and test all the equipment at observatories. The installation, testing and commissioning should start within two weeks after the equipment's arrives at the site d) The bidder will perform on-site test of all the equipment's to be designated representative. One side test plan must be submitted by the bidder well in advanced and should be got approved e) After satisfactory completion on-site test, the system will be operated continuously for a period of 15 days. If it functions without any hardware or software failure during this period, the system will be accepted as commissioned |
| 6. | Other Conditions | <ul style="list-style-type: none"> a) Bidder should also quote any other items that are not included in the above list but is essential for the operation of the system b) Bidder should have servicing capability c) Bidder has to perform the on-site testing of all the equipment's d) Bidder shall submit the list of users and the user certificate of the equipment quoted e) Bidder shall include all relevant literature of the equipment quoted f) Bidder should include the details Para-wise compliance statement along with the bid |
| 7. | Note | <p>It should be clarified that for V-SAT connectivity the following may be mentioned</p> <ul style="list-style-type: none"> a) Ports b) Duplex communication between field and central receiving stations. c) Continuous and trigger mode. d) Extensive error correction. e) Compression of data before transferring to V-SAT |

2.5 Procurement Details:-

1. Tenders to be invited under two parts of the tendering system, namely Part-I: Techno-Commercial Bid and Part-II: Commercial Bid.
2. Payment Terms- Payment to be made in two parts.
 - a. The I Part of 80% payment to be made through irrevocable Letter of Credit against shipping documents.
 - b. The II Part of 20% payment to be made on acceptance of system and on submission of Bank Guarantee for equivalent value with validity for two year from the date of acceptance of goods.
3. For any delay in delivery, liquidated damage @ 1% of contract value per week to be levied with a maximum of 10 weeks. Once maximum is reached termination of order will be considered.
4. RISK PURCHASE VALUE if the supplier fails to supply the goods within the maximum time period specified in the order, the purchase may procure upon such terms and in such manner as it deems appropriate, goods for services similar to those undelivered and the supplier shall be liable to the purchaser for any excess costs for such similar goods and services.