

**Government of India  
Upper Brahmaputra Division  
Dibrugarh**



# **TENDER DOCUMENT**

for

**Procurement, Installation, Commissioning, Comprehensive  
Annual Maintenance of Real Time Hydrological Data  
Acquisition System at Tuting, Upper Siang District,  
Arunachal Pradesh**

**Executive Engineer  
Upper Brahmaputra Division  
Central Water Commission  
Jibon Phukan Nagar, P.O: C.R. Building,  
Dibrugarh – 786003  
Phone No.-0373-2313905/2314398  
Email-ubd-cwc-asm@nic.in**

**GOVERNMENT OF INDIA  
CENTRAL WATER COMMISSION  
UPPER BRAHMAPUTRA DIVISION,  
DIBRUGARH**

**NOTICE INVITING TENDER**

The Executive Engineer, Upper Brahmaputra Division, Central Water Commission, Dibrugarh invites on behalf of the President of India, offline Tenders comprising of Technical and Financial bids from an experienced and eligible Agency for the work “**Procurement, installation, Commissioning and Comprehensive Annual Maintenance of Real Time Hydrological Data Acquisition System at Tuting, Upper Siang District, Arunachal Pradesh**”.

- |  |
|--|
| 1. Name of work: <b>Procurement, installation, Commissioning and Comprehensive Annual Maintenance of Real Time Hydrological Data Acquisition System at Tuting, Upper Siang District, Arunachal Pradesh</b> |
| 2. Estimated Cost: ₹ 63,46,347/-( <b>Rupees Sixty Three Lakhs Forty Six Thousand Three Hundred Forty Seven only</b> ).   |
| 3. Earnest Money: ₹ 1,27, 000/- (Rupees One Lakh Twenty Seven Thousand only)   |
| 4. Performance Guarantee: 5 % of tendered value.   |
| 5. Cost of Tender Document: Rs 1000/-  |

Schedule of Tender

DATE AND TIME OF ISSUE OF BID DOCUMENT OFFLINE	04/06/2019 (16:00 hrs.)
TENDER FORM AVAILABLE OFFLINE FROM	04/06/2019 (16:30 hrs.)
LAST DATE AND TIME FOR DOWNLOADING BIDDING DOCUMENT	14/06/2019 (12:00 hrs.)
LAST DATE AND TIME FOR RECEIPT OF BIDS OFFLINE	14/06/2019 (17:00 hrs.)
DATE AND TIME OF PRE BID MEETING	11/06/2019 (11:00 hrs.)
DATE AND TIME OF OPENING OF TECHNICAL BIDS	15/06/2019 (11:00 hrs.)
DATE AND TIME OF OPENING OF FINANCIAL BIDS	20/06/2019(11:00 hrs.)
PLACE OF OPENING OF BIDS	O/o Executive Engineer, Upper Brahmaputra Division, Central Water Commission, Dibrugarh, Assam, 786003
PRICE OF TENDER DOCUMENT:	Rs.1000/-

2. Tender can be downloaded from websites, [www.eprocure.gov.in](http://www.eprocure.gov.in) and [www.cwc.nic.in](http://www.cwc.nic.in) from 04-06-2019 to 14-06-2019. But tender will be opened only after following payment is made :-

- (i) **Rs.1000/-** in cash as cost of tender or through A/C payee Demand Draft (Non-Refundable) drawn on any schedule bank in favour of the Executive Engineer, Upper Brahmaputra Division, CWC payable at Dibrugarh.
- (ii) The work is estimated to cost **Rs. 63,46, 347/- (Rupees Sixty Three Lakhs Forty Six Thousand Three Hundred Forty Seven) only.**
- (iii) **Rs. 1,27, 000/-** (Rupees One Lakh Twenty Seven Thousand only) as Earnest Money Deposit (EMD) of tender through A/C payee Demand Draft (Refundable) drawn on any schedule bank in favour of the Executive Engineer, Upper Brahmaputra Division, CWC payable at Dibrugarh.
- (iv) The cost of tender and Earnest Money Deposit (EMD) has to be submitted after last date and time of submission of tender and before due date and time of opening of tender (i.e., in between 04-06-2019 to 15-06-2019 upto 11:00 hrs.).
- (v) The tender forms complete in all respects should be submitted offline only by 17:00 hrs on 14-06-2019. Tender should be submitted offline only.
- (vi) The pre-bid meeting for the tender will be held **on 11-06-2019 at 11:00 hours through skype video conferencing.**
- (vii) The Technical bid of the tender will be opened offline at 11:00 hrs. on 15-06-2019 in presence of the tenders who wish to see the offline opening of tender or offline through their authorized representative who may choose to attend offline opening in this office.
- (viii) The financial bid will be opened on 20-06-2019 after opening of technical bid often tender qualifying technical bid.
- (ix) The NIT and tender can be downloaded from [www.cwc.gov.in](http://www.cwc.gov.in) or [www.eprocure.gov.in](http://www.eprocure.gov.in).
- (x) The Invitation to e-tender is subject to fulfillment of instructions and conditions as per schedules below:

Chapter- 1: Instruction to bidders

Chapter -2: Conditions of Contract

Chapter -3: Additional Condition of Contract during AMC

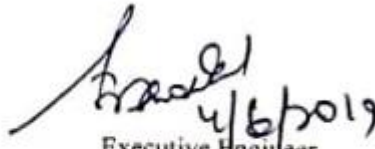
Chapter -4: Technical Specifications

Chapter -5: Technical Specification of Sensors

Chapter-6: Price Schedule

Appendix A: Technical Bid

Appendix B: Financial Bid

  
Executive Engineer  
Upper Brahmaputra Division  
Central Water Commission, Dibrugarh  
Phone No.0373-2313905/2314398  
E-mail:-ubd-cwc-asm@nic.in

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## Chapter 1: Instructions to Bidders

### 1. General

Before submitting the tender it is presumed that the tenderer has understood the exact requirement of the Purchaser and visited hydrological observation site i.e., Tuting, Arunachal Pradesh under the jurisdiction of Central Water Commission, Dibrugarh to understand the facilities and accessibility. In case of any discrepancy or ambiguity observed by the tenderer in the scope of work and the desired deliverable functionality from the work, it is mandatory to raise the clarification in writing by the tenderer and in turn get that clarified from the purchaser in writing at least three days before the last date of tender submission. Tenderer is free to ask any clarification in the Pre-bid meeting to be held on 11-06-2019 at 11:00 A.M. **through skype video conferencing**

In case of no such clarification required by the tenderer, it will be construed that all the requirements of the purchaser are understood by the tenderer. No communications will be entertained in this regard at any stage after the opening of Tenders.

The general instructions are as given below:-

- i. No tenderer will be allowed to amend or withdraw any terms & conditions/parts or whole /quoted prices of its tender under any circumstances after the deadline for submission of the tender.
- ii. The Purchaser has the right to accept or reject any or all the tenders, or cancel the tendering process at any stage, either in part or full, without assigning any reason.
- iii. Canvassing, soliciting, fraud practices, suppression of facts, stating wrong facts and fraudulent practice by the tenderer may lead to rejection of the tender at any stage of the work and may lead to blacklisting for all future CWC works/purchases.
- iv. The tenderers are expected to understand the forms, terms, specifications and other details mentioned in the tender document.
- v. Each tenderer is entitled to submit only one offline bid under his digital signature certificate. The tender document is non transferable.
- vi. At any time prior to the deadline for submission of tenders, the Purchaser, for any reason, whether at its own initiative may modify the scope of work or any condition of the tendering documents by amendments and same will be communicated.
- vii. The tenderers must quote the rates keeping in mind all the terms and conditions mentioned in this document.
- viii. The valid means of communications for this tender shall be in writing, through e-mail and fax followed by confirmation by post.
- ix. It is suggested that the tenderers may acquaint themselves with the requirements of the work before submitting the tender. Tenderer should visit the site before submission of bid.
- x. No deviation in the payment terms mentioned above is permissible in the tender. If a tenderer does not explicitly agree with the payment terms mentioned above, the tender shall be rejected for non-responsiveness.
- xi. The words 'bid' and 'bidding' has been used interchangeably with the words 'tender' and 'tendering' respectively.
- xii. The words 'Tenderer' and 'Agency' has been used interchangeably.
- xiii. Bids shall be submitted offline only to this office. Agencies are advised to follow the instructions provided in the 'Instructions to the Agency/Tenderer for the submission of the bids offline. The tender notice is available at [www.eprocure.gov.in](http://www.eprocure.gov.in) and [www.cwc.gov.in](http://www.cwc.gov.in).
- xiv. Tenderer who has downloaded the tender from Central Public Procurement Portal (CPPP) website <https://eprocure.gov.in> and [www.cwc.nic.in](http://www.cwc.nic.in) shall not tamper/modify the tender form including

downloaded price bid template in any manner. In case if the same is found to be tempered/modified in any manner, tender will be completely rejected and EMD would be forfeited.

- xv. Intending tenderers are advised to visit again CPPP website <https://eprocure.gov.in> at least 1 day prior to closing date of submission of tender for any corrigendum / amendment.
- xvi. For the purpose of this tender the Contract Agreement with the successful tenderer shall comprise of:
  - a. the tender form and Financial bid submitted by the tenderer offline;
  - b. Tender document
  - c. Amendment to the tender document;
  - d. Post tender opening Correspondences both offline and offline; and
  - e. Purchaser's notification of award of the contract.

## **2. SUBMISSION OF DOCUMENTS**

- i. The following documents are to be furnished offline in the technical bid part by the Agency along with bid as per the tender document:
  - a. Signed copy of appropriate value of valid registration certificate, experience certificates of similar works executed as per the tender notice, PAN and Tender Acceptance Letter.
  - b. Signed copy of previous three Financial Years (2016-17, 2017-18, 2018-19) Income-tax filed GST No./TIN No./Affidavit of partnership firm/ Pvt. Ltd. or public Ltd. company registered certificate.
  - c. Signed and scanned copy of audited Balance sheet of last three years.
  - d. Any other document in support of the Bid.
  - e. Before opening of tender, the Agency/Tenderer are required to furnish following at the office of EE, Upper Brahmaputra Division, Dibrugarh
    - Cost of the tender amounting to Rs.1000/-
    - EMD amount of Rs. 1,27, 000/- (Rupees One Lakh Twenty Seven Thousand) only
- ii. Qualification/Eligibility Criteria for the Tenderers:
  - a. The Agency should be registered in India with permanent office anywhere in India.
  - b. The bidder should have GST No./PAN/Aadhar No.
  - c. Joint Ventures (JV) shall submit its full details;
  - d. The Agency should not have been blacklisted by any authority. A declaration to the effect should be furnished.
  - e. The Agency shall provide accurate information about any litigation or arbitration resulting from contracts completed or ongoing under its execution over the last five years. A consistent history of awards against the Agency or any partner of a joint venture may result in failure of the contract.
  - f. Contractors whose near relatives are Divisional Accountant or Engineering Officers between the grades of Chief Engineer and Junior Engineer (both inclusive) in the Central Water Commission (CWC) will not be allowed to tender for works in the respective Regional office responsible for award and execution of contract is the one where the near relative is working. For this purpose a near relative shall mean father, mother, wife/husband, son(s), daughter(s), brother(s), sister(s).
  - g. No Engineer or any other official employed in Engineering or Administrative duties in the Engineering Department of the Government of India is allowed to work in the CWC either as contractor or as employee of a contractor for a period of one year after his retirement from Government service unless he has obtained prior permission of Government of India to do so. Even after enlistment, if either the contractor or any of his employees is found to be a person who had not obtained the prior permission of Government of India as aforesaid, the Contract shall be cancelled.
  - h. Average Annual financial turnover of related services during the last three years, ending 31<sup>st</sup> March of the previous financial year, should be at least

Liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the contract, of no less than the amount specified in the Bid Data Sheet (BDS).

**3. Qualification Documents to be submitted:**

- i. Copies of original registration certificate documents defining the constitution or legal status, place of registration and principal place of business; written power of attorney of the signatory of the bid to commit the bidder. Appropriate business licences/registrations:
  - a) GST No.
  - b) PAN number
- ii. Total monetary value of services performed for each of the last three years;
- iii. Copies of work orders and experience in related work for each of the last three years and details of services under way or contractually committed; and names and address of clients who may be contacted for further information on those contracts;
- iv. Evidence of adequacy of working capital for this contract (access to line(s) of credit and availability of other financial resources);
- v. Audited financial statements for the last three years 2016-17, 2017-18 and 2018-19 (copies of the Profit and Loss (P/L) statements along with Balance Sheet for the concerned period);
- vi. Bank Account details;
- vii. Authority to seek references from the bidder's bankers;
- viii. Information regarding any litigation, current or during the last five years, in which the Bidder is involved, the parties concerned and disputed amount; and
- ix. Proposals for sub-contracting components of the services amounting to more than 10 (Ten) per cent of the contract price.

**4. Site Visit:** The bidder, at the bidder's own responsibility is encouraged to visit at their own cost and examine the site of required services and its surroundings and obtain all information that may be necessary for preparing the bid and entering into a contract for the services.

**5. Period of Validity of tenders:** Tenders shall remain valid for 90 days after the date of tender opening. In exceptional circumstances, the Purchaser may solicit the Tenderer's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. The tender security provided shall also be suitably extended. Tenderer may refuse the request without forfeiting its EMD.

**6. Tender Security and Performance Security**

**Earnest Money Deposit (EMD):-** EMD shall be deposited in the form of Crossed Demand Draft in favour of EE, Upper Brahmaputra Division, Central Water Commission, Dibrugarh, Assam payable at Dibrugarh or in the form of a Bank Guarantee from a scheduled bank as per proforma given in tender document. In case the EMD is submitted in the form of the Bank Guarantee it shall remain valid upto 90 days beyond the final tender validity period. The tenders unaccompanied by the Tender Security/EMD will be rejected summarily.

**The EMD will be forfeited if:**

- a. if a tenderer withdraws its tender during the period of tender validity specified by the tenderer; or
  - b. in case of a successful tenderer, if the tenderer fails:
    - (i) to sign the Contract within 15 days of the issue of the notification for award of the contract; or
    - (ii) to furnish the specified performance security.
- Government Departments and Public Undertakings are exempted from furnishing this security.

**7. Refund of EMD-** EMD furnished by all unsuccessful tenderers will be returned to them without any interest whatsoever, at the earliest after expiry of the final tender validity period but not later than 30 days after conclusion of the contract. EMD of the successful tenderer should be returned, without any interest whatsoever, after receipt of performance security from it as called for in the contract.

**8. Performance security-** The successful bidder shall furnish performance security deposit at the rate 5% on the contract value within 7 days after notification of the award and it should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier, including warranty obligations. It does not carry any interest/FDR in favour of EE, Upper Brahmaputra Division, Central Water Commission, Dibrugarh.

- i. Performance Security will be refunded to the supplier without any interest, whatsoever, after it duly performs and completes the contract in all respects but not later than 60 days of completion of all such obligations under the contract.
- ii. Performance security may be furnished in the form of account payee Demand Draft in favour of EE, Upper Brahmaputra Division, Central Water Commission, Dibrugarh, Assam) payable at Dibrugarh or Fixed Deposit Receipt from a commercial bank or Bank Guarantee from commercial bank in a prescribed format as given in tender document.
- iii. Performance security is liable to be forfeited in case successful tenderer does not fulfil contract obligations.

**9. Contents of Tender Document:**

The contents of the tendering documents as listed below shall be read in conjunction with any corrigendum/addenda, if issued. All the components of the tender shall be considered as a single tender document and include:

- (i) Notice Inviting Tender
- (ii) Instructions to the Tenderers
- (iii) Conditions of the Contract
- (iv) Schedule of requirement.
- (v) Specifications and allied technical details.
- (vi) Price schedule
- (vii) Contract Form
- (viii) Other standard forms
- (ix) Performance Security Forms/Bid Security (EMD).

**10. Tendering Process**

**i. Marking and submission of tenders:**

The tender shall be submitted offline only.

The tenderers should submit both “Technical bid” and “Financial Bid” offline. The specifications should be same as given in this tender or higher. The EMD should be sealed in envelope duly marked as “EMD” and must reach office of Executive Engineer before opening of tender. Tenders of bidder whose EMD would not reach in time will not be opened offline and will be archived.

Tenders must be submitted by the bidder offline no later than the time and date specified in the NIT.

The Purchaser may, at its discretion, extend this deadline for submission of tenders by amending the tendering documents, in which case all rights and obligations of the Purchaser and tenderers previously subjected to the deadline will thereafter be subjected to the deadline as extended.

No tender may be withdrawn in the interval between the deadline for submission of tenders and the expiration of the period of tender validity specified by the tenderer on the Tender Form. Withdrawal of a tender during this interval may result in the tenderer's forfeiture of its tender security.

**ii. Opening of Bids:**

The bids shall be opened offline on the date and time mentioned in the NIT. Tenders unaccompanied by the Tender Security (EMD) shall be archived and will not be opened.

Financial Bids of only those bidders who are found technically acceptable would be considered in the presence of tenderers or their representatives.

**iii. Prices**



Prices quoted by the tenderer shall be fixed during the tenderer's performance of the Contract and not subject to variation on any account except for conditions given in tender document and shall be inclusive of all taxes, duties, octroi, transportation charges etc. The prices should be given as per the format given in price schedule.

- a. All prices should be in Indian Rupee.
- b. The amount should be written both in figures and in words.
- c. Prices for each item shall be furnished offline only.
- d. The tenderer should quote for all the items mentioned in the schedule of requirement. The tenders not quoting for all the items are liable to be rejected.
- e. The tender for the works shall remain open for acceptance for a period of 60 sixty days from the date of opening of tenders. If any tenderer withdraws his tender before the said period or makes any modifications in the terms and conditions of the tender which are not acceptable to government, then the Government shall without prejudice to any other right or remedy, be at liberty to forfeit 50% of said earnest money as aforesaid. Further the tenderer shall not be allowed to participate in the re-tendering process of the work.
- f. Non-conformities between the figures and words of the Quoted Prices – Sometimes, non-conformities/errors are also observed between the quoted prices in figures and that in words. The same is to be taken care of as indicated below:
  - i. If, in the price structure quoted for the required goods, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
  - ii. If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
  - iii. If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

#### iv. Evaluation of Tenders

The tenders will be evaluated on the basis of specifications as given the tender document and unit rate of each item and total cost.

- a) The Technical Bids will be evaluated based on the track record and past experience of the firm in providing similar work as required. The weightage for the technical evaluation shall be assigned as under:

Sl. No.	Details	Maximum Marks
1.	Previous experience of agency in providing similar category of work/supply to Government/semi Government Agencies (10 marks to be assigned per year of previous experience)	50 marks
2.	Clean track record of the Firm during the last three years (10 marks per year) if no show-cause notice/debarment notice received (no marks will be assigned for the year during which show-cause notice/debarment notice was received)	30 marks
3.	Financial status (Profit or loss of the firm during the previous two financial years) (10 marks for each year if there was profit as per the audited accounts)	20 marks.

- b) The financial bids will be opened only of those bidders whose technical bids would be complete in all respects as per tender document and such bidders score a minimum of 50 marks in the technical evaluation. Further, in case the same lowest rate is quoted by more than one eligible

firm, the selection will be based on the marks obtained by them at the time of Technical Bid analysis.

The purchaser does not bind himself to accept the lowest or any other tender.

**v. Award of Work**

Within seven (07) days of the receipt of notification of award from the Purchaser, the successful tenderer shall sign the contract agreement as given in tender document and furnish the specified performance security. However, Government Departments and Public Undertakings are exempted from furnishing this security.

**11. Bid Data sheet**

**A. GENERAL**

Name and address of the purchaser: Executive Engineer, Upper Brahmaputra Division,  
Central Water Commission, Dibrugarh, Assam,  
786003

Tender number: 04/01/NIT/2019-UBD/1104-07 dt.04/06/2019

Qualification requirements: - As specified in tender document

**B. PRE-BID MEETING:** The bidder's designated representative is invited to attend a pre bid meeting which will take place as per details given below: 11/06/2019 **at 11:00 hrs. through skype video conferencing.**

The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

**C. PREPARATION OF BIDS**

- i. The price quoted by the bidder shall be fixed.
- ii. Tenders shall remain valid for 90 days after the date of tender opening. In exceptional circumstances, the Purchaser may solicit the Tenderer's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. The EMD provided shall also be suitably extended.

**D. SUBMISSION OF BIDS**

- i. Last date and time for Technical bid submission is 14-06-2019 at 17:00 hrs.

**E. BID OPENING AND EVALUATION**

The Technical bid of the tender will be opened offline on 15-06-2019 at 11:00 hrs. in presence of the tenders who wish to see the offline opening of tender through their authorized representative. The opening of financial bids will be 15/06/2019.

**F. Settlement of Disputes**

The settlement of all the disputes of any kind arising out of this contract shall be first through a Mediator engaged with mutual consent and only after dissatisfaction with that, the (joint) Arbitrator(s) shall be appointed as per Arbitration & Conciliation Act 1996.

**12. Special instructions to Bidders for submission of Tender**

The Special Instructions supplement 'Instruction to Bidders', as given in these Tender Documents. Submission of Offline Bids in hard copy is only medium for submission of Tender. #

## **Chapter 2- Conditions of Contract**

### **1. Definitions & Interpretations**

**Services** mean the services as identified in the tender document and to be provided at the purchaser's facility as per the contract.

**Contract** means the agreement reached by the Purchaser and the Contractor for the purpose of the work mentioned in this document. All documents, letters, correspondences exchanged for this work shall be the part of the contract.

**Contract Price:** The cost of work identified in the Contractor proposal is included in the Contract Price in their entirety. This will include such additions/ deductions made under variation order as allowed under this contract.

**Notices** shall be deemed to include any approvals, consents, Instructions, certificates and clarifications to be given under this contract.

**The Purchaser** is: The President of India through Executive Engineer, (Name of Division and address).

**Contractor:** The Contractor is the agency of the successful tenderer with whom the purchaser enters into a contract for the supply of goods detailed in this document.

**The Execution Period** is the period during which the Contractor is liable to carry out work without any additional cost to the purchaser.

**Non-Responsive tender:** Any tender not meeting all the requirements mentioned in the tender document.

### **2. SCOPE OF WORK**

The contractor shall be required to provide all of the following services:

- i. The Executive Engineer, U. B. Division, CWC, **Dibrugarh**, invites, on behalf of The President of India, e-tenders comprising of technical and financial bids from an experienced firms for the work **“Procurement, installation, Testing, Commissioning and Maintenance of real – time data acquisition (Water Level, Water Velocity & Water Quality) at Tuting Arunachal Pradesh under UPPER BRAHAMPUTRA DIVISION, CWC, DIBRUGARH”** on turnkey basis for collection, **transmission and processing of water level, water velocity & water quality data through satellite and VSAT based telemetry and associated systems including all equipments, hardware, software and peripherals** and civil construction work for installation of system at sites, with a comprehensive warranty of two years and maintenance for five years after the expiry of the warranty period.
- ii. Performing on-site assembly, start-up of the supplied Goods and supervision.
- iii. Clearances and obtaining approvals/ permissions from various Govt. agencies for supply of goods and for operation of all the satellite transmission/ wireless equipment with necessary assistance from the purchaser for obtaining such clearances.
- iv. Supply of tools required for assembly and/or maintenance of the supplied Goods.
- v. Supply of detailed operations and maintenance manual in original along with four (4) copies of each for each appropriate unit of supplied Goods.
- vi. Supply of spares to be procured by the purchaser.
- vii. Training of the Department's personnel at the stations to be decided by the purchaser.
- viii. Provision of Warranty services after handover of the entire system for a period of 2 years.
- ix. Performance or supervision or maintenance and/or repair/replacement of the supplied Goods, for a period of 5 years beyond warranty period, provided that this service shall not relieve the Contractor of any warranty obligations under this Contract. **It is further clarified that spares @ minimum 10 % of the parts likely to be needed for repairs during the Warranty/ AMC shall be kept by the contractor in the stores of the purchaser.**
- x. Integration of the installed systems/remote site with the existing VSAT Link at Modeling Centers at UBD (Dibrugarh), FFM Directorate, CWC, New Delhi & ERS at Delhi or ERS at any other location, duly addressing the compatibility issues, if any, with successful data transmission to the CWC Modeling Center at UBD (Dibrugarh). The compatibility issues that would arise and their smooth resolution have to be assessed and ensured by the supplier. The tenderer is advised to check & ascertain compatibility issues that would arise in transmission of data to existing Modeling Centers at UBD (Dibrugarh) & ERS, Delhi by checking its concerned specifications, at his own cost, before submitting the tender, to avoid any problem in this regard. It is the full

responsibility of the vendor to ensure data communication up to modeling center through suitable integration with existing system, and ensure data communication.

The requisite hardware for ERS and modeling center is already in place, and not a part of the present tender. However, it is clarified that the successful bidder shall be fully responsible (except for the hardware issues beyond the scope of the present tender) for transmission of the data from ERS Delhi to Modeling centers at **the places mentioned in the tender document** for their respective sites, and FFM Dte. CWC, New Delhi for all sites. The bidders are therefore advised to visit the ERS and modeling centers mentioned above, to ensure full compatibility of their data formats with the existing systems.

- xi. In case of any conflict arising in interpretation of any Para of NIT, the decision of the Purchaser shall be final & binding.

### **3. Documents of Contract**

All the documents shall be considered as correlative, complementary and mutually explanatory. The contract shall be read as a whole for the interpretations. All correspondences, notices etc. shall form a part of the contract.

### **4. Interpretations**

*Language:* shall be English only for the purpose of this contract.

*Context:* the singular and plural shall be interchangeable as per the context of the contract.

### **5. Contractor's responsibilities and Obligations**

- a. The Contractor will abide by the job safety, insurance, customs and immigration measures prevalent and laws in force and will be liable to indemnify the Purchaser from all demands or responsibilities arising from accidents or loss of life, the cause of which is the Contractor's negligence. The Contractor will pay all indemnities arising from such incidents and will not hold the Purchaser responsible in any manner.
- b. The Contractor is responsible to conduct all contracted activities with due care and diligence, in accordance with the Contract and using state-of-the-art methods and economic principles, and exercising all reasonable means to achieve the performance specified in the Contract.
- c. The Contractor is obliged to work closely with the Purchaser and abide by directives that are consistent with the terms of the Contract.
- d. The Contractor whose tender is accepted, will be required to furnish:-
  - i. Performance security
  - ii. Certificate of GST Registration.
  - iii. Photo copy of registration certificate.
  - iv. Photo copy of PAN
  - v. Up-to date GST clearance certified along-with the bid documents
  - vi. Any other document as required by the purchaser

### **6. Purchaser's responsibilities**

- a. The purchaser will ensure accuracy of all information.
- b. The purchaser will ensure the availability of sites for the work. .
- c. The site for the work is available.

### **7. Duration of contract**

The Procurement, Installation & Commissioning of Real Time Hydrological Data Acquisition System at Tuting, Upper Siang District, Arunachal Pradesh should be carried out during 2019-20. The duration of Comprehensive Annual Maintenance of the system is 5 Years after completion of 2 Years warranty period.

### **8. Programme of work**

The contractor has to start the work within 07 days of award of contract at the location i.e., Tuting, Arunachal Pradesh.

## **9. Confidentiality**

- a. The Contractor shall not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, or any specification or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Contractor in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.
- b. Any document, other than the Contract itself, shall remain the property of the Purchaser and all copies thereof shall be returned to the Purchaser on termination of the Contract.
- c. The Contractor shall not, without the Purchaser's prior written consent, make use of any document or information enumerated in this document except for purpose of performing the Contract.
- d. The Purchaser shall not, without the Contractor's prior written consent, disclose any documents, data or other information furnished by the Contractor in connection with the Contract, and clearly identified in advance by the Contractor as being confidential, to parties not directly involved in the project(s) covered by the Contract.

## **10. General Conditions of Contract:**

- 1) Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by Government of India and Government of Assam & Arunachal Pradesh.
- 2) Incomplete tenders/tenders without specified EMD shall be rejected.
- 3) The bidder should not have been black listed by any Government or non-Government institutions or Government Department undertaking/public enterprises.
- 4) The Firms shall be registered in India.
- 5) The contractor should be professionals & having experience in the relevant works.
- 6) The competent authority on behalf of President of India does not bind itself to accept the lowest or any tender, and reserves its right to reject or postponed any or all of the tenders received without the assignment of any reason. All tenders in whom any of the prescribed conditions are not fulfilled or are incomplete in any respect are liable to rejected.
- 7) Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection.
- 8) Copies of other documents pertaining to the works will be open for inspection by the tenderers at the office of the above mentioned officer. Tenderer are advised to inspect and examine the site and its surrounding and satisfy themselves before submitting their tenders, the form and nature of the site, the means of access to the site and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tender shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed. Submission of a tender by a tenderer implies that he has read this notice and all other documents and has made himself aware of the scope and specifications of the work to be done.
- 9) Bid must reach to this office in hard copy through offline mode only.
- 10) This office shall not be liable for any financial or any other loss occur to bidder for bidding through CPP portal due to any technical or administrative or any other reasons.

This office shall not be liable for any financial or any other loss occur to bidder due to cancellation of tendering process at any stage by this office.

## 11. SPECIAL CONDITIONS OF CONTRACT

**Definition:** In this Contract, the following terms shall be interpreted as indicated

“**The Contract**” means the agreement entered into between the Purchaser and the Contractor, as recorded in the Contract Form signed by the parties, including all amendments, attachments and appendices thereto and all documents incorporated by reference therein.

“**The Contract Price**” means the price payable to the Contractor under the Contract for the full and proper performance of its contractual obligations.

“**The Goods**” means all of the equipment, machinery and / or other materials which the Contractors are required to supply to the Purchaser under the contract.

“**The Services**” means those services ancillary to the supply of the Goods, such as transportation and insurance, and any other incidental services, such as installation, commissioning, provision of technical assistance, training, warranty, annual maintenance and other such obligations of the Contractor covered under the contract.

“**The Purchaser/ Department**” means Central Water Commission through Executive Engineer, U. B. Division, CWC, Dibrugarh.

“**The Tenderer/ Bidder/ Contractor/ Vendor/ Supplier**” means the individual or firm supplying the Goods and Services under this contract.

“**The Project Site**” where applicable, means the place or places named in Conditions of Contract.

“**Remote Station/Site**” as listed in the schedule of requirements (Table 2) where the sensors, data logger and transmission facilities are to be installed i.e., Tuting, Arunachal Pradesh.

“**Modeling Centre**” the office location where the data transmitted by the remote sites is to be received using VSAT network i.e., CWC HQ (New Delhi) & UBD (Dibrugarh),

**Applications:** These conditions shall supplement / modify the General Conditions of the Contract.

**Country of Origin:** For purposes of this Clause, “Origin” means the place where the Goods were mined, grown, or produced, or from which the services are supplied. Goods are produced when, through manufacturing, processing, or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.

The origin of Goods and Services is distinct from the nationality of the Contractor.

**Standards-** The Goods supplied under this Contract shall conform to the standards mentioned in the Technical Specifications, and, when no applicable standard is mentioned, to the authoritative standards appropriate to the Goods’ country of origin. Such standards shall be the latest issued by the concerned institution.

### 2. Use of Contract Documents and Information Inspection and audit by the Government of India

- a. The contractor shall not, without the Purchaser’s prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Contractor in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.
- b. The contractor shall not, without the Purchaser’s prior written consent, make use of any document or information except for purposes of performing the contract.
- c. Any document, other than the contract itself, shall remain the property of the purchaser and shall be returned (all copies) to the purchaser on completion of the Contractor’s performance under the contract if so required by the purchaser.
- d. The contractor shall permit the authorized representative of the Purchaser to inspect the contractor’s accounts and records relating to the performance of the contractor and to have them audited by auditors appointed by the Purchaser if so required by the Purchaser.

**3. Patent Rights:** The contractor shall indemnify the purchaser against all third party claims of infringement of patent, trademark, or industrial design rights arising from use of the Goods or any part thereof in the Purchaser's country.

**4. Inspections and tests**

- a. The purchaser or its representative shall have the right to inspect and / or test the Goods to confirm their conformity to the contract specifications at no extra cost to the purchaser. The technical specifications shall specify what inspections and tests the purchaser requires and where they are to be conducted. The purchaser shall notify the contractor in writing, in a timely manner, of the identity of any representatives retained for these purposes. TA/DA of the inspection team will be borne by the purchaser.
- b. The inspections and tests may be conducted on the premises of the Contractor or its subcontractor(s), at point of delivery, and / or at the Good's final destination. If conducted on the premises of the Contractor or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the purchaser.
- c. Should any inspected or tested Goods, fail to conform to the specifications, the purchaser may reject the Goods and the contractor shall either replace the rejected Goods or make alterations necessary to meet specification requirements free of cost to the purchaser.
- d. The purchaser's right to inspect, test and, where necessary, reject the goods after the goods' arrival in the Purchaser's country shall in no way be limited or waived by reason of the Goods having previously been inspected, tested, and passed by the purchaser or its representative prior to the Goods shipment from the country of origin. Nothing shall in any way release the Contractor from any warranty or other obligations under this contract.
- e. The inspection of the Goods shall be carried out to check whether the Goods are in conformity with the technical specifications attached to the contract agreement and shall be in line with the inspection/test procedures laid down in the Technical Specifications. Complete hardware and software as specified in the contract should be supplied, installed and commissioned properly by the contractor prior to commencement of acceptance tests.
- f. In the event of the hardware and software failing to pass the acceptance test, a period not exceeding two weeks will be given to rectify the defects and clear the acceptance test, failing which the purchaser reserves the rights to get the equipment replaced by the contractor at no extra cost to the purchaser.
- g. Before the goods and equipment are taken over by the Purchaser, the Contractor shall supply operation and maintenance manuals together with drawings of the goods civil works and equipment. These shall be in such detail as will enable the Purchaser to operate, maintain, adjust and repair all parts of the works as stated in the technical specifications.
- h. The manuals and drawings shall be in the ruling language (English) and in such form and numbers as stated in the Technical specifications.
- i. Unless and otherwise agreed, the goods and equipment shall not be considered to be completed for the purpose of taking over until such manuals and drawings have been supplied to the Purchaser.
- j. For the System software & other Software's, the Contractor shall provide complete and legal documentation of hardware, all subsystems, operating systems, compiler, system software and the other software. The Contractor shall also provide licensed software for all software products, whether developed by it or acquired from others. The contractor shall also indemnify the purchaser against any levies/penalties on account of any default in this regard.

- k. Acceptance Certificates: On successful completion of acceptability test, receipt of deliverables etc, and after the purchaser is satisfied with the working on the system, the acceptance certificate will be issued as under:
- l. Acceptance Certificate for a Remote station shall be issued on successful completion of site acceptance tests specified in the technical specifications by the official/officers appointed by Engineer-in Charge.
- m. Acceptance Certificate for the whole work shall be issued on receipt of acceptance certificates of all the remote stations, successful completion of all acceptance tests, handing over of all documentation pertaining to the work as per technical specifications and after conduction of training programme as specified in specified in tender document and hand over of component of spares for the organization to the designated representative of the Engineer-in-charge.
- n. The training as specified in the Technical specifications for each hardware and software component installed shall be provided to the personnel designated by the Purchaser (05-10 nos.) to enable them to effectively operate the total system. The training shall be conducted on the dates mutually agreed upon and within six months from the date of acceptance of supply. The expenditure of training programme shall be borne by the supplier.

## **5. Packing**

- a. The contractor shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit, and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the final destination and the absence of heavy handling facilities at all points in transit.
- b. The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, including additional requirements, if any, and in any subsequent instructions ordered by the Purchaser.
- c. Packing Instructions: The Contractor will be required to make separate packages for the Consignee. Each package will be marked on three sides with proper paint/indelible ink with the following:
  - (i) Project; (ii) Contract No.; (iii) Country of Origin of Goods; (iv) Contractor's Name; (v) Packing List Reference number.

## **6. Transportation & Delivery**

- a. The Contractor is required under the Contract to transport the Goods to a specified place of destination defined as project site. Transport of Goods to such place of destination including insurance, shall be arranged by the Contractor, and the related cost shall be included in the Contract Price.
- b. Arrangement for secure storage of the goods at designated location near the project site prior to installation shall be responsibility of the Contractor. The Purchaser may, if available, provide such unsecured accommodation as may be available for the purpose on a specific request from the contractor. Watch & ward of the same has to be arranged by contractor at his expenses.
- c. Delivery of the Goods shall be made by the Contractor in accordance with the terms specified by the Department in the Notification of Award.



- d. Contractor shall be responsible till the entire stores ordered for arrive in good condition at destination and are installed, tested and commissioned.

#### **7. Site preparation and installation**

- a. The Purchaser will provide details of the installations location before the scheduled installation date to allow the Contractor to perform a site inspection and construction of suitable civil structures before the installation of the hardware.
- b. The location of telemetry tower/hutment (as per requirement) and radar sensors for river water level, water velocity and water quality will be decided by the respective Site Engineer in-charge.
- c. The contractor should complete the required works at the site for proper installation of the equipment before receipt of the equipment.

#### **8. Incidental Services**

The contractor shall be required to provide any or all of the following services:

- a. Performance or supervision of the on-site assembly and/or start-up of the supplied Goods;
- b. Furnishing of appropriate hardware, system design and programming services required for development and /or maintenance of the supplied goods;
- c. Furnishing of detailed operations and maintenance manual for each appropriate unit of supplied Goods;
- d. Performance or supervision or maintenance and/or repair/replacement of the supplied Goods, for a period of five years beyond warranty period, provided that this service shall not relieve the Contractor of any warranty obligations under this Contract;
- e. Software updates and bug fixing services for the software originally developed by the Contractor during the period of warranty and subsequent maintenance of five years. For the third party software packages supplied, the updates shall be provided during the warranty period.
- f. Training of the Department's personnel, in assembly, start-up, operation, maintenance and/or repair of the supplied Goods at the stations to be decided by the purchaser.
- g. The travel, boarding, lodging and other payment to his staff for erection, installation and maintenance at the sites shall be the responsibility of the Contractor.

#### **9. Spare parts**

The Contractor is required to provide any or all of the following materials, notifications and information pertaining to spare parts manufactured or distributed by the Contractor.

- a. Such spare parts as the Department may elect to purchase from the Contractor, providing that this election shall not relieve the Contractor of any warranty obligations under the Contract; and
- b. In the event of termination of production of the spare parts;
  - i. Advance notification to the Department of the pending termination, in sufficient time, to permit the Department to procure needed requirements; and
  - ii. Following such termination, furnishing at no cost to the Department, the blue prints, drawings and specifications of the spare parts, if requested.
- c. The Contractor shall carry sufficient inventories to assure ex – stock supply of consumables and spares in the country. Contractors shall ensure the availability of after sales service for a period of at least ten years including warranty period.
- d. The spare parts being procured as a part of this tender are only for the benefit of the purchaser, for his own use. The same shall not be available for use by the Contractor during any fault in warranty/ AMC period. It shall be the sole responsibility of the contractor to maintain his own set of spares for fulfilling the warranty/ AMC requirements. **It is further stipulated that the contractor shall maintain spares requiring repairs / replacement during warranty or AMC at least @ 10% in the stores of the purchaser, to be used for fulfilling the obligation during warranty/ AMC. Whenever such a spare is taken by the contractor, the same shall be promptly restored after repairs or replacement in the store of the purchaser. However, these spares shall remain the property of the contractor and the cost thereto shall NOT be considered for either financial evaluation or for payment.**

## 10. Warranty

- a. The Contractor warrants that the Goods supplied under the contract are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The contractor further warrants that all Goods supplied and all civil works undertaken under this Contract shall have no defect, arising from design, materials, or workmanship (except when the design and / or material is required by the Purchaser's specifications) or from any act or omission of the Contractor, that may develop under normal use of the supplied Goods in the conditions prevailing in the country of final destination.
- b. This warranty for the whole system, in respect of station which has been accepted as a part of the acceptance certification, shall remain valid for twenty-four (24) months from the date of signing of the Complete Acceptance Certificate after successful completion of the Completion Acceptance Test. The contractor shall, in addition, comply with the performance guarantees specified under the contract. If, for reasons attributable to the contractor, these guarantees are not attained in whole or in part, the contractor shall, make such changes, modifications, and /or addition to the goods or any part specified in the contract at its own cost and expense and to carry out further performance tests in accordance with Clause 6 as above.
- c. The purchaser shall promptly notify the contractor in writing of any claims arising under this warranty.
- d. The purchaser shall notify Contractor of any errors and malfunctions, which occur and noticed when equipment are in use, by fax/telephone/e-mail/special messenger directly or through his Service Engineer(s) at his office address during normal working hours or at their residence after normal office hours and/or on holidays.
- e. The Contractor shall ensure proper functioning of all equipment installed at Tuting and satisfactory data transmission from Tuting and data receipt at the existing CWC modeling centre at UBD (Dibrugarh), routed through the existing CWC's Delhi or ERS at any other location, by the existing VSAT arrangement.
- f. The maximum response time for a complaint from any of the destination specified in the schedule of requirements, i.e., time required for contractor's maintenance engineers to restore the data acquisition from the remote station after a request sms/ fax /e-mail is made or letter is written shall not exceed 96 hours. Upon receipt of such notice, the Contractor shall, visit the site and shall initiate repair or initiate replacement the defective Goods or parts thereof, without cost to the Department within 96 hours.
- g. A remote site shall be treated as faulty if it fails to respond or transmits erroneous data during three consecutive pre-programmed observation cycles. The decision of Engineer-in-Charge about errors in data shall be final and binding. If a remote site continues to remain "fail" for more than 12 hours in excess of the maintenance time schedule of 96 hours. The contractor is liable to pay penalty @ Rs. 5000/- per Day. **In case of partial failure, penalty would be imposed on pro-rata basis on parameter (Water level/velocity/water quality) being transmitted.** The Day for the purpose of penalty shall be taken as failure period of 24 hours or part thereof for a particular remote site.
- h. If the Contractor fails to replenish the spares or return the equipment after satisfactory repairs within 90 days from date of complaint made, this will be considered as failure of a remote stations and a penalty @ Rs. 1400/- per Day/ item shall be applicable.
- i. If the Contractor, having been notified, fails to remedy the defect(s) within the time specified in clauses 10(f) to 10(h) the purchaser may proceed to take such remedial action as may be necessary, at the contractor's risk and expense as specified in clause 10(f) to 10(h) and without prejudice to any other rights which the purchaser may have against the contractor under the contract.

- j. The amount of penalty as indicated in the above clauses will be subject to maximum 10% of the cost of the equipment including installation, but excluding AMC. The amount of penalty will be recovered from balance 10% amount withheld (Security Deposit/ Performance Guarantee) during warranty or from any payment due to contractor. The Department may also proceed to take such remedial action as may be necessary, at the Contractor's risk and expense and without prejudice to any other rights which the Department may have against the Contractor under the Contract.
- k. The authority to review the penalty shall be Superintending Engineer Hydrological Observation Circle (HOC), CWC, Guwahati.
- l. The bidder should have offline system of lodging and monitoring of the complaints regarding functioning of the system.

#### **11. Maintenance Service**

- a. Free maintenance services for equipment as well as civil works and other related accessories like cables etc. shall be provided by the contractor during the period of warranty. After warranty period, annual maintenance and repairs of the entire system consisting of equipment and civil works including supply of spares etc. for next 60 months beyond warranty period will be done by the contractor on quarterly blocks basis.
- b. Contractor shall set up appropriate site office equipped with all requisite infra structural facilities at his own cost and notify its office and residential addresses to the Purchaser to handle the complaints within 14 days from the date of signing this contract.
- c. Contractor shall provide services of an original manufacture certified engineer having Diploma/Degree in Electronics, at respective site offices. He should have sufficient experience of working upon and troubleshooting with the equipment installed. He should ensure the receipt of data from remote site and will check its correctness with manual data wherever possible, on weekly basis to AE/JE of this office, so as to ensure the receipt of data on regular basis.
- d. The Annual maintenance charges shall be quoted year-wise for the entire period of five years following warranty period of two years.
- e. The Annual maintenance charges during any year shall be payable on pro-rata basis on the basis of actual quantities of components being covered under AMC.
- f. The Purchaser reserves the right to terminate the contract in full or in part at the end of any of the two-year blocks.
- g. If during operation, the real minimum time between failures (MTBF) of any piece of equipment or component thereof does not prove to be more than 90% (ninety percent) of the specified MTBF, the contractor shall replace the unit component with another of at least the same performance quality at no cost to the purchaser.
- h. Without limiting the generality of the foregoing, Licensor further represents and warrants:
  - i. That the Hardware and Software shall not be abnormally end or provide invalid or incorrect results as a result of date data, specifically including date data which represents or references different centuries or more than one century.
  - ii. That the Hardware and Software shall manage and manipulate data involving dates, including single century formulas and multi-century formulas, and will not cause an abnormally ending scenario within the application or generate incorrect data.

- i. It is further stipulated that the contractor shall maintain spares requiring repairs / replacement during warranty or AMC at least @ 10% in the stores of the purchaser, to be used for fulfilling the obligation during warranty/ AMC. Whenever such a spare is taken by the contractor, the same shall be promptly restored after repairs or replacement in the store of the purchaser. However, these spares shall remain the property of the contractor and the cost thereto shall NOT be considered for either financial evaluation or for payment.
- j. The bidder should have offline system of lodging and monitoring of the complaints regarding functioning of the system.

## **12. Additional Conditions during Warranty:**

- a. The Contractor shall make suitable arrangement to ensure that it's representative mandatorily visit the station once in a month and submit a certified report of matching automated measured data with the manual data.
- b. Dismantling and re-installation of any equipment for whatsoever reason will be done free of cost by the Contractor as per the direction of Engineer-in –charge.
- c. The maximum acceptable difference between manual gauge readings of CWC, wherever available, and the system calculated reading is  $\pm 1$  cm of water level.
- d. The maximum acceptable variation between manual Water Quality (pH, DO, Ec, Turbidity & Temp.) reading of Divisional Laboratory and the telemetry reading is 10%.
- e. The maximum acceptable variation between manual Water velocity reading of current meter and the telemetry reading is 10%.

## **13. Measurement**

- a. The measurements shall be carried out as per procedure.
- b. Engineer-in charge shall designate an Assistant Engineer/ Junior Engineer/authorized official in who will be responsible for recording the measurements and forwarding the same to Engineer-in-charge.
- c. The Junior Engineer shall acknowledge the receipt of Goods subject to further verification and settlement at the time of installation at site by way of signing the delivery challan-in-triplicate and shall handover two copies of the same to Contractor.
- d. The Contractor shall transport required goods for installation at project site and shall unpack and get the individual components, equipment, consumables and spares verified in terms of their numbers and quantities by the Junior Engineer.
- e. The Contractor shall carry out all civil, mechanical, electrical, electronic and fabrication work at Project site and shall get the quantities of major items of work recorded in the measurement books of the Junior Engineer.
- f. The Contractor shall also demonstrate performance of the installation as a whole at the project site in a mutually agreed manner so as to enable the Junior Engineer to fill up the check list provided by the Engineer-in-charge for ensuring acceptable performance of the project site.
- g. The Assistant Engineer/Junior Engineer shall issue an Acceptance Certificate in respect of the project site on demonstration by the Contractor towards satisfactory acquisition of the data by the DCU from all the sensors and satisfactory storage of the same in its internal memory. The performance of the solar panel and battery pack shall also be included in the Acceptance Certificate.
- h. The Engineer-in-charge shall issue a Completion Certificate in respect of station on demonstration of satisfactory acquisition, transmission and receipt of data from the station to modeling center server for a continuous period of 7 days and completion of all training modules and handover of all documentation.

- i. The records generated at para 13(c) to 13(h) shall be provided by the Junior Engineer to Engineer-in-Charge for releasing the payments against such measurements as per Stages provided in the payment clause.

#### 14. Payment

The method and conditions of payment to be made to the Contractor under this Contract shall be as follows:-

- a. Payment shall be made in Indian Rupees only. The payment will be released through Electronic Bank Transfer in favor of Contractor.
- b. Payment shall be made for Goods and services excluding AMC.
  - i. **Ten (10) %** of contract price excluding AMC charges mobilization advance against bank guarantee, which shall be released **after** successful completion of 2 years of Warranty and 5 years of AMC.
  - ii. **Fifty Five (55) %** of the Contract price excluding AMC charges shall be paid after the issue of completion certificate, i.e., complete installation including civil works, establishing of connectivity between existing modeling centre at UBD (Dibrugarh) and FFM Directorate, CWC, Delhi & successful link between sites, ERS Delhi and VSAT at **the designated place** based on successful completion of Site Acceptance Test as mentioned in tender document.
  - iii. **Balance Thirty Five (35) %** of the Contract price excluding AMC charges shall be paid @ 5% every year AFTER each year of successful running of contract including 2 years of warranty and 5 years of AMC.
- c. Payments for annual maintenance services and service tax at the prevailing rates as agreed shall be paid in equal quarterly installments and after successful maintenance of the system during the quarter.
- d. Deductions from the bill:
  - i. Security Deposit shall be deducted as per Clause of Standard/General Contract Conditions.
  - ii. The Income tax as applicable shall be deducted at source from the bill.
  - iii. Certificate on account of taxes payable/paid to the Government shall be given to the contractor.
  - iv. No other certificate for claiming any other tax exemptions shall be given.
  - v. The contractor shall be responsible for payment of all taxes and levies as per prevailing Govt. rules. A declaration in this regard is required to be submitted by the Contractor before release of payment.

#### 15. Prices

Prices payable to the contractor as stated in the contract shall be firm and not subject to adjustment during the performance of the contract, i.e., warranty period (2 years) + AMC period (5 years). Prices quoted shall be inclusive of all taxes and duties levied at the country of origin or in India.

#### 16. Change Orders

The Purchaser may at any time, by a written order given to the Contractor, make changes within the general scope of the contract in any one or more of the following:

- a. Drawings, designs, or specifications, where Goods to be furnished under the contract are to be specifically manufactured for the Purchaser;
- b. The method of shipment or packing;
- c. The place of delivery; and / or
- d. The Services to be provided by the Contractor.
- e. If any such change causes an increase or decrease in the cost of, or the time required for, the contractor's performance of any provisions under the contract, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Contractor for adjustment under this clause must be asserted within thirty (30) days from the date of the Contractor's receipt of the Purchaser's change order.

## **17. Contract Amendments:**

Subject to the tender document, no variation in or modification of the terms of the Contract shall be made except by written amendment agreed and signed by the parties.

## **18. Assignments**

The contractor shall not assign, in whole or in part to the other firm/person, its obligations to perform under this Contract, except with the Purchaser's prior written consent.

## **19. Sub-contracts**

- a. The Contractor shall notify the Purchaser in writing of all sub-contracts awarded under this contract if not already specified in the tender. Such notifications, in the original tender or later, shall not relieve the contractor from any liability or obligation under the contract.
- b. Sub-contracts must comply with the provisions of General Conditions of Contract.

## **20. Delays in the contractor's Performance**

- a. Delivery of the Goods and performance of Services shall be made by the Contractor in accordance with the time schedule prescribed by the Purchaser in the Schedule of Requirements.
- b. If at any time during performance of the Contract, the Contractor or its sub-contractor(s) should encounter conditions impeding timely delivery of the Goods and performance of Services, the Contractor shall promptly notify the purchaser in writing of the fact of the delay, its likely duration and its cause(s) As soon as practicable after receipt of the Contractor's notice, the purchaser shall evaluate the situation and may at its discretion extend the Contractor's time for performance, with or without liquidated damages, in which case the extension shall be ratified by the parties by amendment of the Contract.
- c. Except as provided under Clause 20, a delay by the Contractor in the performance of its delivery obligations shall render the Contractor liable to the imposition of liquidated damages pursuant to Clause 21 unless an extension of time is agreed upon pursuant without the application of liquidated damages.

## **21. Liquidated Damages**

If the Contractor fails to deliver any or all of the Goods or to perform the Services within the period(s) specified in the Contract, the purchaser shall, without prejudice to its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified of the delivered price of the delayed Goods or unperformed Services for each week or part thereof delay until actual delivery or performance, up to a maximum deduction of the percentage specified .Once the maximum is reached, the purchaser may consider termination of the Contract pursuant to Clause 22. The applicable rate is 1.5% per month and the Maximum deduction is 10% of the contract price.

## **22. Termination for Default**

- a. The Purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the Contractor, may terminate this Contract in whole or in part.
  - i. If the Contractor fails to deliver any or all of the Goods within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser.
  - ii. If the Contractor fails to perform any other obligation(s) under the contract.
  - iii. If the Contractor, in the judgment of the Purchaser has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.
- b. For the purpose of this clause:
  - i. "Corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.
  - ii. "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Purchaser, and includes collusive practice among Tenderers (prior to or after tender submission) designed to establish

tender prices at artificial non-competitive levels and to deprive the Purchaser of the benefits of free and open competition.

In the event the Purchaser terminates the Contract in whole or in part, pursuant to Clause 22.1, the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or services similar to those undelivered and the contractor shall be liable to the Purchaser for any excess costs for such similar Goods or Services. However, the contractor shall continue performance of the Contract to the extent not terminated.

**23. Force Majeure**

- a. Notwithstanding the provisions of Clause 20, 21 and 22, the Contractor shall not be liable for forfeiture of performance security liquidated damages or termination for default if and to the extent that its delay in performance or other failure to perform the obligations under the Contract is the result of an event of Force Majeure.
- b. For purposes of this Clause, "Force Majeure" means an event beyond the control of the Contractor and not involving the Contractor's fault or negligence and not foreseeable. Such events may include but are not restricted to, acts of the Purchaser in its sovereign capacity, wars or revolutions, fires, epidemics, quarantine restrictions, and freight embargos.
- c. If a Force Majeure situation arises, the Contractor shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Contractor shall continue to perform its obligations under the contract as far as reasonably practical, and shall seek, all reasonable alternative means for performance not prevented by the force Majeure event.
- d. For an instance of floods, Force Majeure shall be considered only in case the river level CROSSES the designated highest historically recorded Flood Level (HFL) for that site.**
- e. In case of Force Majeure, the system will be made operational by the Contractor within 30 days. The rates of spare parts will be as per the rates quoted by the Contractor in his bid document, and the rates shall remain valid throughout the contract period. The rates of civil works will be as per prevailing CPWD scheduled rates.

**24. Termination for Insolvency**

The Purchaser may at any time terminate the Contract by giving written notice to the Contractor if the Contractor becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the Contractor, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Purchaser.

**25. Termination for Convenience:**

- a. The Purchaser, by written notice sent to the Contractor, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Contractor under the Contract is terminated, and the date upon which such termination becomes effective.
- b. The Goods that are complete and ready for shipment within thirty (30) days after the Contractor's receipt of notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect:
  - i. To have any portion completed and delivered at the Contract terms and prices; and/or
  - ii. To cancel the remainder and pay to the Contractor as agreed amount for partially completed Goods and Services and for materials and parts previously procured by the Contractor.

## **26. Resolution of disputes**

- a. The purchaser and the Contractor shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them and or in connection with the Contract.
- b. If, after thirty (30) days from the commencement of such informal negotiations, the Purchaser and the Contractor have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanisms specified. These mechanisms may include, but are not restricted to, conciliation mediated by a third party, adjudication in an agreed national forum.



### **Chapter-3: ADDITIONAL CONDITIONS OF CONTRACT DURING ANNUAL MAINTENANCE PERIOD (AMC)**

#### **1. SCOPE OF WORK DURING MAINTENANCE PERIOD:**

- a. The maintenance services to be provided by the contractor under this contract shall be for entire system, in accordance with the terms and conditions laid down in the contract, of the telemetry equipment / system, all accessories and attachments of the equipment / systems installed at Remote Station i.e., Tuting, Arunachal Pradesh including providing of all required consumables, additional spare parts, repair of the defective equipment or units/parts thereof, orientation of antenna whenever required due to any change(s) in position of the satellite and imparting training to the officers of the Central Water Commission about operation and maintenance of telemetry system.
- b. Contractor shall maintain his site office at appropriate central location, equipped with all requisite infrastructural facilities at his own cost and notify its office and addresses to the Engineer-in-charge, to handle the complaints.
- c. Contractor shall provide services of an original manufacture certified engineer having Diploma/Degree in Electronics & Telecommunications, at respective site offices. The site engineer should have sufficient experience of working upon and troubleshooting with the equipment installed. He should ensure the receipt of data from remote site, and check its correctness by comparing with manual data wherever possible on weekly basis to AE/JE of this office, so as to ensure the receipt of data on regular basis.
- d. Purchaser shall notify Contractor of any errors and malfunctions, which occur and noticed when equipment are in use, by fax/telephone/e-mail/special messenger directly or through his Service Engineer(s) at his office address during normal working hours or at their residence after normal office hours and/or on holidays.
- e. Contractor shall provide maintenance services to the Purchaser at Data Acquisition Sites (DAS) and correct the defect(s) reported by the Purchaser, within a period of 96 hours on receipt of the complaint.
- f. The Contractor shall ensure proper functioning of all equipment installed at DAS and satisfactory data transmission from all DAS and data receipt at the existing CWC's Delhi or ERS at any other location, by utilizing the spare parts available at designated places and by providing additional spare parts for which no additional cost will be paid by the Purchaser. Such designated locations will be mutually agreed at the time of commencement of work.
- g. The Contractor shall, at his own cost, carry out repair of the defective equipment or parts thereof, to the satisfaction of the Purchaser and return the equipment after satisfactory repair within 30 days from the date of written complaint/request made. All charges towards collection, transportation of defective equipment, return of equipment after repair including cost of repair defective equipment or parts thereof, shall be borne by the Contractor and no charges on this account shall be paid by the Purchaser.
- h. **It is further stipulated that the contractor shall maintain spares requiring repairs / replacement during warranty or AMC at least @ 10% in the stores of the purchaser, to be used for fulfilling the obligation during warranty/ AMC. Whenever such a spare is taken by the contractor, the same shall be promptly restored after repairs or replacement in the store of the purchaser. However, these spares shall remain the property of the contractor and the cost thereto shall NOT be considered for either financial evaluation or for payment.**
- i. Any damage to equipment of the Telemetry system due to any act of vandalism shall be made good by replacement by the contractor free of cost during the period of AMC/ warranty for which spares/ consumables will be provided by the CWC at the scheduled rate. This replacement shall be in addition to the damage caused by the river waters during monsoon/non-monsoon period.

- j. The Contractor shall make suitable arrangement to ensure that it's representative mandatorily visit the station once in a month and submit a certified report of matching of data with the manual data.
- k.
  - i. Dismantling and re-installation of any equipment of for whatsoever reason will be done free of cost by the Contractor as per the direction of Engineer-in –charge.
  - ii. The maximum acceptable difference between manual gauge reading of CWC, wherever available, and the automated measured reading is  $\pm 1$  cm of water level.
  - iii. The maximum acceptable variation between manual Water Quality (pH, DO, E.C, Turbidity & temp.) reading of Divisional Laboratory and the telemetry reading is 10%.
  - iv. The maximum acceptable variation between manual Water velocity reading of current meter, and the telemetry reading is 10%.

## 2. **PENALTY CLAUSE:**

Upon receipt of notification of defect in the system from Purchaser, if Contractor fails to take immediate corrective measures to rectify the defect, within the stipulated maximum response time stated above, the contractor is liable to pay penalty for unsatisfactory performance of maintenance services, in accordance with the criteria laid down below:

- a. A remote site shall be treated as faulty if it fails to respond or transmits erroneous data during three consecutive pre-programmed observation cycles. The decision of Engineer-in-Charge about errors in data shall be final and binding. If the remote site continues to remain “fail” for more than 12 hours in excess of the maintenance time schedule of 96 hours. The contractor is liable to pay penalty @ Rs. 5000/- per Day. The Day for the purpose of penalty shall be taken as failure period of 24 hours or part thereof for a particular remote site.

The maximum limit of the total penalty in a year on this account shall be limited to the 50% of the value of maintenance contract for corresponding year.

- b. The contractor shall ensure all that all the compatibility issues, if any that may arise are addressed successfully while integrating the installed remote stations with the existing CWC's Delhi or ERS at any other location, and satisfactory receipt of data at the CWC's existing modeling center at UBD (Dibrugarh) & FFM Directorate, CWC, Delhi, if still no data is received at CWC's existing modeling center at UBD (Dibrugarh) & FFM Directorate, CWC, Delhi through the CWC's existing Delhi or ERS at any other location, it will be treated as “fail” and if such a failure continues for more than 48 hours , the contractor is liable to pay a penalty as specified above. However, non-receipt of data at the existing CWC's Delhi or ERS at any other location, due to any other failure not attributed to the installed remote stations or for any other reason beyond the control of the contractor, the penalty shall not be imposed.

The maximum limit of the total penalty in a year on this account shall be limited to the 50% of the value of maintenance contract for corresponding year.

- c. If the Contractor fails to rectify the defects or fails to return the equipment after satisfactory repair within the permitted time frame, he shall be liable to pay the penalty at the rates indicated in clauses as per the contract. The period of penalty shall be calculated from the time effective from the time of expiry of the time schedule allowed for fault rectification / return of the equipment after satisfactory repair.
- d. The authority to impose the penalty is the respective Executive Engineer, and the authority to review the penalty is the Superintending Engineer concerned.
- e. The total penalty in a year shall be limited to the value of maintenance contract for the corresponding year.

### 3. TERMS OF PAYMENT:

- a. Any taxes and/or other Governmental levies as applicable or becoming applicable later due to or under any law shall be deducted from the bill.
- b. The maintenance and repair cost shall be paid quarterly, on satisfactory performance of maintenance services.
- c. The payment shall be made by Electronic Bank transfer only in Indian Rupees.

### 4. OTHER TERMS AND CONDITIONS:

#### a) **Renewal of agreement**

This agreement could, thereafter, be renewed for successive periods as mutually decided from time to time.

#### b) **Access to Purchaser's site/Contractor's office & Records relates to past experience of such equipment in India.**

The Junior Engineer/authorized representative of Engineer-in-Charge shall provide free access to the sites where the defect has occurred. e.g., Remote Station equipment may be under lock & key for which the Junior Engineer/authorized representative of Engineer-in-Charge shall make sure that free access to such sites are made available for necessary actions at contractor's end. He will also arrange for the security clearance, wherever required in advance to ensure that contractor's engineers get the access to site immediately.

#### c) **Spares/ Equipment**

**The contractor shall maintain spares requiring repairs / replacement during warranty or AMC at least @ 10% in the stores of the purchaser, to be used for fulfilling the obligation during warranty/ AMC. Whenever such a spare is taken by the contractor, the same shall be promptly restored after repairs or replacement in the store of the purchaser. However, these spares shall remain the property of the contractor and the cost thereto shall NOT be considered for either financial evaluation or for payment.**

Excluding the above mentioned spares/equipment maintained by the Department any import/purchase of any of such components as required during the maintenance, the same shall also be the sole responsibility of the contractor. If the contractor fails to repair the equipment/spare due to non-availability of the spare /technological changes the same may be replaced by the contractor with equivalent equipment / spare of same specification and reputed make with prior permission of Engineer-in- charge and the costs involved in this process shall be borne by the contractor. Non-returning of the defective spares/equipment after due repair within stipulated time as specified above shall attract the penalty.

#### d) **Consumables**

Contractor shall be responsible for, providing & replacement of consumable items like DCP Batteries, Batteries of UPS, cables, tubes, silica gel connectors and other similar items.

#### e) **Periodical routine services**

Periodical routine services viz. Pre and Post monsoon calibration shall be done by the Contractor at each site. Reports in this regard shall be submitted to the Purchaser by 14<sup>th</sup> May and 31<sup>st</sup> December respectively each year, and these reports shall be mandatory for release of payment of AMC. If the contractor fails to calibrate data acquisition stations as per schedule specified above, the contractor is liable to pay penalty of Rs. 20,000/- per station in each case.

Apart from the above, the bidder has to make the site visit as & when required, as per the site requirements.

**f) Change of Satellite**

- i. Changes required for realigning the system at central stations and remote stations due to the change in operating satellite for this project shall be done by the Contractor at his own cost. Equipment required to undertake this change will be arranged by Contractor. The contractor shall have to realign the system for any no. of changes in satellite position during the contract period and no additional payment will be paid to contractor on account of multiple times of realignments.
- ii. The contractor is responsible for managing the activities of its personnel or subcontracted personnel and will hold itself responsible for any misdemeanors.
- iii. The contractor will treat as confidential all data and information about the Department, obtained in the execution of his responsibilities, in strict confidence and will not reveal such information to any other party without the prior written approval of the Department.

## **Chapter- 4: Technical Details**

### **1. Design Principles**

The following basic principles have been applied to the design of the real time hydrologic data acquisition system network.

- i. Installation of Non-contact type Radar Water Level Sensors and Velocity Radar Sensors in River Canal (Open Channel environment) which will have the primary function of measurement of water levels and measurement of flow in open channels and rivers where reliable velocity data is required continuously, during floods or periods of high concentrations of suspended sediments. The sensor shall be mounted above the water surface, away from floating debris using a flexible bracket for vertical or horizontal installation. Velocity and water level measurements shall compute the discharge at the installed locations (Rivers / Canals /Reservoirs) and communicate to data logger.
- ii. Installation of Water Quality Monitoring Sensor System includes a sensor package and external data logger interface package. The Water Quality Monitoring System includes sensors for temperature, pH, dissolved oxygen (DO), depth, and turbidity. This measurement shall be done in lakes, rivers, streams or large / small water bodies. The Water Quality Monitoring System shall be connected to data loggers, data collection platforms, and other monitoring instruments via suitable interface.
- iii. Recoded data from Non-contact type Radar Water Level Sensors. Velocity Radar Sensors and Water Quality Monitoring Sensor System shall be stored in the Data logger and same will be transmitted through VSAT link to central State Data Center (SDC) and from central Receiving Stations to e-SWIS software for further processing.

### **2. Scope of Work**

- i. Complete supply, installation, testing, commissioning of remote stations including associated civil works, sensors, data logger, software, hardware and ancillaries' equipment, solar panel, mounting poles, masts, towers, cables, electrical and network cabling, lightening arrestors, earthing etc. complete.
- ii. Technical design, supply, installation, testing, commissioning of the real time hydrological and Water quality data collection network and establish data communications using VSAT between the remote stations and the Central State Data Center (SDC), and to the dedicated computer Server provided at State Data Center. This includes, but is not limited to acquiring service, and maintaining all aspects of the service during the warranty period as well as the maintenance period.
- iii. Providing server with 5 years data backup facility (8 TB), 42" LED Display, offline 3KVA UPS and computer node, internet connection with requisite public IP address, firewalls and other required networking components with network wiring, at State Data Centre located at ----, that will support the reception of **VSAT telemetry** data directly from remote station.
- iv. Assure the collection, storage/backup and seamless flow of Real Time Data from all types of automated sensors to State Data Center.
- v. Perform on-site assembly, start-up of the supplied goods.
- vi. Complete commissioning integration, testing & organization of the whole system. Bidder is responsible for, interfaces between the sensors and the DCP, DCP and transmission equipment and data transmission to SDC via VSAT telemetry link including the software, and ensure compatible data format as per bid document and trouble free operation of system.

- vii. Provide operation & maintenance services during Five (5) years warranty period and Two (2) years AMC period to commence immediately after the expiry of warranty period to include all components at the remote stations as well as all newly acquired equipment in the data center. The **AMC** must be comprehensive without any exclusion except from physical damage or force majeure will be permitted.
- viii. Provide installation and maintenance reports as required by the Purchaser and any delay is not acceptable in time schedule provided by supplier.
- ix. Supply on-site spares to repair any part of the remote stations upon determination of malfunction or failure. This includes, but is not limited to, DCP, sensors, batteries, solar panel and other accessories etc. required in seamless operation of the real time data acquisition system
- x. Supply detailed operation and maintenance manual for each component in the system and compile Knowledge and working supply type Manual for training purpose (including multimedia training kits).
- xi. Provide classroom and field training to the purchaser's personnel, on the complete system. This includes operation and maintenance procedures. Training will also occur at selected field locations as selected by the Purchaser.
- xii. Provide formal and on-the-job training to purchaser's personnel at in-house & onsite. This includes start-up, operation, maintenance and/or repair of the supplied goods. Course topics will include sensor calibration, data logger configuration, data downloading, data retrieval, collection, Trouble shooting, processing maintenance requirements and procedure for equipment configuration, installation, site testing and commissioning including training kit containing course material in soft and hard copies.
- xiii. Onsite Calibration and validation of the installed system shall be performed on half yearly basis which shall be continuous process during the entire warranty period & **AMC** period. This will include calibration of gate sensors to obtain discharge passing through gates for dams/weirs and calibration of canals against water level to obtain discharge data.
- xiv. To provide necessary facility to generate daily report of data at specified time and in the specified format as prescribed by Engineer-in-charge.
- xv. The remote stations (DCPs) shall store the data for at least one year.
- xvi. Supply a detailed operation and maintenance manual for each appropriate unit of supplied goods.
- xvii. A guarantee by the manufacturer that all equipment being provided will have maintenance & Spare support for a minimum of ten years from the date of issuance of final acceptance certificate by engineer in charge including Warranty and Operation & Maintenance period;

### **3. General Features/ Specifications**

#### *General Features/ Specifications*

- i. It is imperative that all instrumentation, other equipment shall operate effectively with the Data Collection Platform (DCP)'s and the DCP's in turn shall operate effectively with the satellite equipment and other systems of ERS. In addition, the input/output protocols of individual items of equipment (gauges, DCP's, solar power arrangements, etc.) shall interface accurately. For this purpose, the interfaces between the sensors and the DCP, DCP and transmission equipment and that to State Data Centers are ensured to be compatible and trouble free.
- ii. The specific electrical, electronic and mechanical design parameters mentioned in case of individual sensors are indicative of a typical design and variations therein can be considered provided the output, resolution accuracy and ruggedness against environment are not compromised in any manner. In such cases where the supplier proposes to deviate from the

specifications a full technical justification shall be provided. The Purchaser is not bound to accept such justification.

- iii. It shall be the Suppliers responsibility to ensure that the installation is robust and shall continue to work in extreme weather conditions.
- iv. Reliability of operation during normal and extreme weather conditions is imperative.
- v. The sensors and all accessories and facilities shall be fully compatible with the data acquisition and transmission system. The sensors and DCP's shall form a complete automated data acquisition storage and transmission system.
- vi. In case of any of the sensors, the equipment is supplied with certain optional features which are required to be ordered separately and are not included as a part of the offer; the same shall be clearly mentioned in the bid along with the functions of such features. The purchaser shall be provided with all necessary information which shall enable him to take an informed decision at the time of entering into the contract as to the ordering any such feature or otherwise.
- vii. The Bidder shall enclose technical literature with photographs in respect of all the sensors, data logger and other equipment being quoted. The features which are mentioned in the literature but are not being quoted as a part of the current system shall be clearly brought out in the bid. In the event of failure of the Bidder to explicitly mention any such exclusion, it shall be taken as inclusion of all features mentioned in the bid as a part of the supply and the Bidder shall have to provide all such features/ accessories without claim of extra cost to the purchaser.
- viii. Although all accessories and fixtures required for installation of the equipment & their specifications have been specified in technical specifications however, bidder shall ensure the satisfactory performance & functioning of the complete system, for this if any accessory or item s are required that shall be provided by bidder, the cost towards that is deemed to be included in the cost tendered by the bidder, no extra cost shall be paid to the bidder on this account.
- ix. Bidders shall give general layout of all the installations including all civil works for types of stations and materials including that for the equipment at the time of bidding. Afterwards, the successful Bidder shall furnish the details of all the mounting arrangements, including civil works. Indian Standard codes of practice shall be followed for all civil works and mounting arrangements.
- x. The security arrangement provisions for sensors installed in the open ground like chain-link fencing, locking etc. shall be provided by the Bidder
- xi. Security of installed equipment's including theft and vandalism will be the responsibility of the Bidder till successful installation, commissioning, two stages of site acceptance testing.
- xii. All fixings shall be non-corrodible.
- xiii. The Bidder has to specify how the calibration will be carried out and has to use his own calibration equipment during the period of warranty and AMC.
- xiv. Ensure that all software licenses and maintenance agreements are in the name of Purchaser and should seek full support and updates for such software for the duration of the **Warranty and AMC Period**. Also all the software licenses should be valid for the design life of the system, that is 10 years from date of commissioning.

## 4 EQUIPMENT ARRANGEMENT AT REMOTE STATIONS

The Automatic Real Time Data Acquisition System shall be equipped with all necessary equipment's and peripherals including the following

- i. Data Collection Platform (DCP) mounted inside a weatherproof enclosure which will house in the following items.
  - Data Logger with VSAT Transmission facilities with built-in display.
  - Battery for power requirements
  - Pre-wiring and configuration.
  - Solar panel-based power supply system.
  - Antenna's required for VSAT telemetry
- ii. Installation of suitable range of Non-contact type Water Level Radar sensor and Velocity Radar Sensors in River /Canal (Open Channel environment) which will have the primary function of measurement of water levels. Flow and discharge in rivers /Canal with all fittings, accessories and cables and conduits.
- iii. Installation of suitable Water Quality Monitoring Sensor System includes sensors for temperature, pH, dissolved oxygen (DO), depth, and turbidity. This measurement shall be done in lakes, rivers, streams or large / small water bodies. The Water Quality Monitoring System shall be connected to data loggers
- iv. Installation of VSAT System including Indoor and Outdoor unit, Antenna and required cabling
- v. Mast / tripod to mount DCP at the site (alternatively, wherever the instrumentation shelter is available DCP enclosure, VSAT equipment shall be mounted in the same).
- vi. Mast / tripod for solar panel & VSAT antenna (provided locally by the Bidder). Mast can be shared with the DCP mast also.
- vii. Civil works required for fixing Sensors, DCP Mast/tripod(provided locally by the Bidder)
- viii. Conduit for cables GI Flexible conduits and HDPE pipe conduits.
- ix. Chain-Link fencing (5m X 5m X 2m height) and gate with lock if required (provided locally by the Bidder)
- x. Power & signal cables with cable conduits.
- xi. Grounding and lightning protection (provided locally by the Bidder)
- xii. All necessary hardware required for the system to operate properly.

### TELEMETRY

The data communications employed on RTDAS network will use VSAT telemetry communications. It will be the responsibility of the bidder to confirm communication path. The bidder will be ultimately responsible for establishing data communication at all sites.

The bidder will provide all associated civil works related to the installation of the antenna, including cabling, wiring and other such infrastructure.

### STATE DATA CENTER (SDC)

The State Data Center (SDC) will be established at ----. The SDC will receive Sensor data directly from remote stations vis VSAT telemetry link. This data will be stored in the data base server at SDC. Necessary equipment such as, Server for VSAT data receiver, High End workstation, 42 inch LED Display, etc. will be installed at SDC.



## **VSAT DATA COLLECTION STATION**

- The VSAT data collection station shall be established at SDC.
- The VSAT data collection station will be able to interrogate the DCPs based on a schedule of the State's choice and as implemented by the bidder.
- The VSAT Data Collection Station will also be able to receive data sent by the remote stations connectivity.
- In case of failure of telemetry, the provision for polling the past data by VSAT telemetry so that missing of data is avoided.
- The bidder will provide all civil works related to the installation of the antenna, including cabling, wiring and other such infrastructure required to operate the VSAT Data Collection Station.

## **INSTALLATION GUIDELINES FOR RTDAS (Real Time Data Acquisition System)**

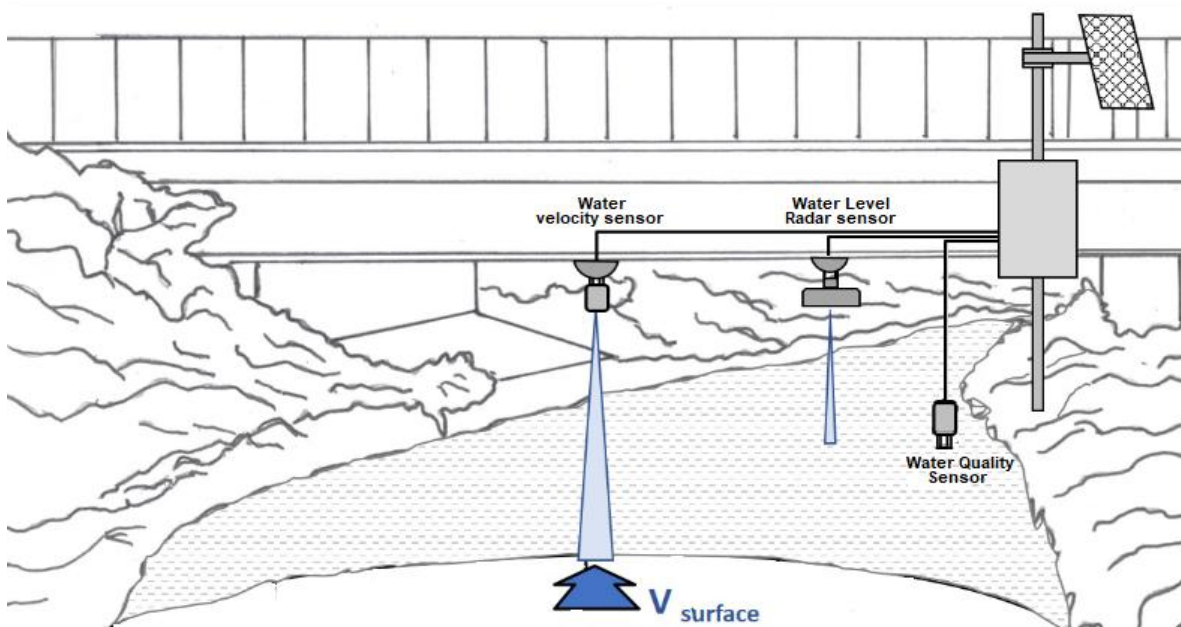
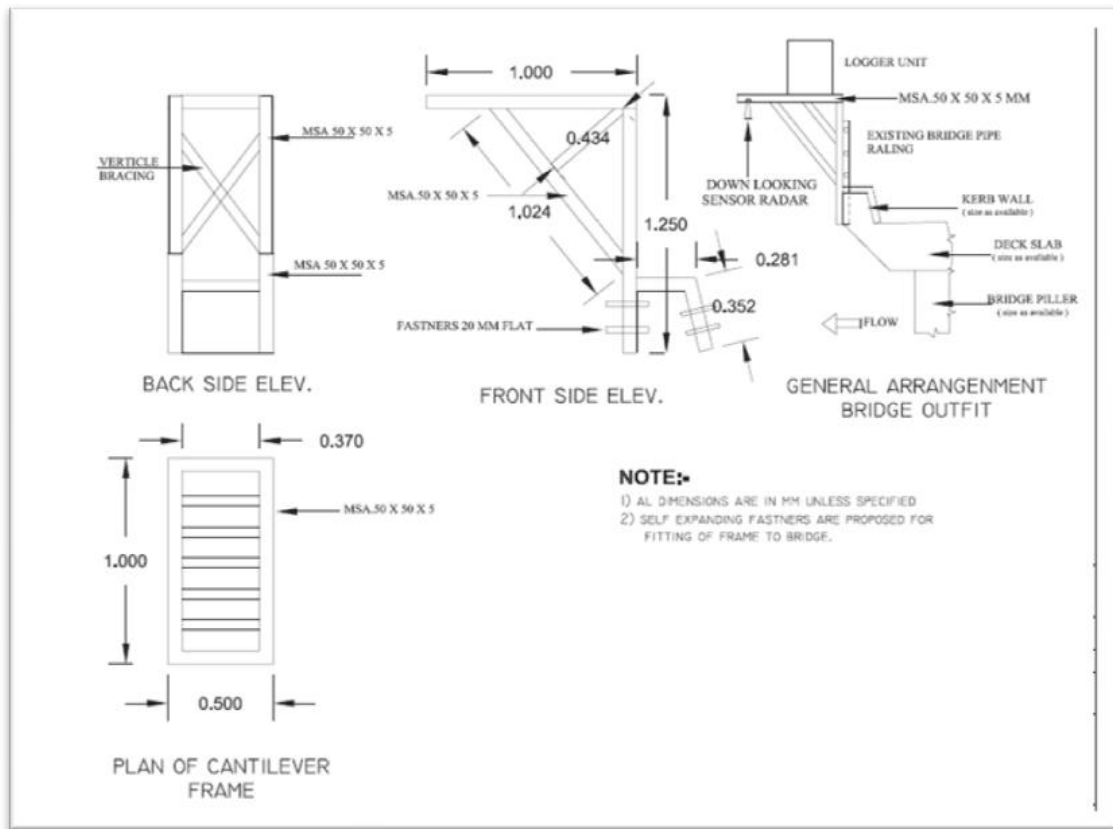
### **Site Preparation and Installation**

1. The purchaser will provide details of the installation sites before the scheduled installation date to allow the Bidder to perform site inspection and construction of suitable structures before the installation of the hardware.
2. The location of antenna and sensors will be decided by the respective Site Engineer-in-charge depending on the site and river flow conditions
3. The Bidder should complete the required works at the site for proper installation of the equipment before receipt of the equipment.
4. These are the basic guidelines for installation of RTDAS system however it may vary as per site conditions, in case of variation from installation guidelines drawings shall be approved by engineer-in charge prior to the start of installation work

## **SPECIFICATIONS FOR INSTALLATION**

### **i) Automatic Water Level Recorder Sensors**

- The sensor and its accessories should be protected from theft. The bidder is encouraged for minor modifications in installation of sensor and its accessories so as to minimize the chances of theft. Mortise lock is proposed to avoid theft. Due care must be taken while modifying the installations. In no case the basic principle and working of sensor is allowed to disturb.
- Radar sensors should be mounted such that they have a direct vertical shot to the water surface with no obstruction of their beams. Beam spread must be determined based on manufacturer's specification and the maximum expected distance to be measured at low flows. Consideration should be made in designing the mounting structure to allow for easy access to the instrument for maintenance
- Framework support to attach Radar sensor to Bridge Tower:-
- Framework support made of fabrication of M.S. Angle 50mm x 50mm x 5mm with gusset plate 8mm thick (0.85m x 0.3m) including welding, riveting, anticorrosive paint, colour etc. complete as per Fig on Page No. 38.



## Specifications for Civil Works

### Common Enclosure for Site

Area for the complete system should be ideally  $5\text{m} \times 5\text{m} \times 2\text{m}$  height. If a rare condition demands than even lesser area ( $4\text{m} \times 4\text{m}$ ) can be demarcated in consultation with officials.

The approach to the site should be made free of obstacles like bushes; trees etc. and a suitable cement path must be laid to approach the platform.

Following are the common specification for civil works for all the Telemetry sites.

### **Fencing for the site**

- The height of the fencing for the site enclosure must be 2 meters from the ground level.
- The fencing must be made over a cement enclosure which is 300mm above ground level.
- Fencing angle should be of size 40mm x 40mm x 6mm and pre coated with red-oxide.
- The total length of the fencing angle should be 2.8 meters i.e. (2.0m above ground level + 0.8 m below ground level)
- Two MS angles must be used diagonally at each of the four corner angles of the site. The angles can be attached (with welding or the other appropriate means) from the middle of the existing corner angle to the ground. The depth of the support will remain the same as of main angle.
- The dimensions of the fencing angle foundation should be 450mm x 450mm (length x width) and at a depth of 800mm. The foundation should be square shaped. Distance between each fencing angle should be 1.5 to 2meter.

### **Chain-link**

- Dimensions of GI Chain-link:3 inches x 3 inches and of Gauge: 10 (3 mm diameter)
- GI chain-link mesh must be stretched and welded/fixed properly on the fencing angles.
- A pipe or angle must be fixed on the upper part of the fencing to have a neat finishing and at the same time to avoid loosening of the fencing over a period of time.
- The chain-link fencing should be fastened with the help of screws fitted on the fencing angles. Alternately it may be welded neatly at four equidistant positions of 0.5 m each.

### **Gate**

- Dimensions: 1 m X 2 m (Width x Height) with locking facility
- The gate must be fabricated by MS Angle whose dimensions should be minimum 40mm x 40mm x 6mm.
- Suitable locking facility with 3 keys for safety purposes is mandatory. Standard locks should be used.
- Gate and MS Angle must be well painted with white / silver colour.
- Gate should have proper support of MS angles with additional support of crossed MS angles. Alternately gate should be fixed with the support of RCC pillars.

### **Mast Foundation**

- Foundation Dimensions: 750mm X 750mm (length x width) and 1.2m deep. The raised platform of the foundation must be 300mm. above the ground level.
- The height of the mast should be minimum 3 meters above raised platform.

### **Mast and Supports**

These shall satisfy the following specifications:

#### **Mast:**

- Height: as per need (3-5 m)
- Can be manufactured locally, according to the Bidder's instructions, if good (corrosion resistant) quality is available
- Including guys and all accessories/ tools for mast mounting must be able to resist a wind speed of 110 km/hour
- Bidder can propose alternative mounting according to site conditions but meet the strength conditions for wind.

#### **Sensor Supports and Brackets:**

- Aluminum or stainless steel
- Sensor mounting supports and other accessories as required

### **Proportions for concrete foundations**

- Concrete pillar foundations for the mast /tower, fencing angle should be made in the volumetric mixing proportions as follows:
- Concrete foundation : 1 (Cement) : 2 (Sand) : 4 (Metal)
- Fine plastering : 1 (Cement) : 4 (Sand)
- Concrete Pillar must be cemented to achieve smooth finish above the ground level.
- After 8 hours, these foundations should be cured with water at least 3 times a day for four days.

### **Local Earthing**

- Material required: Salt: 20 Kg; Charcoal: 20 Kg; Sand 100 Kg
- The lightning arrestor rod is made of copper which is mounted on the top most part of the mast /tower.
- It should be of thickness 12 mm and of one meter length with a connected copper wire of 6mm thickness (gauge). At the other end of copper wire is the Earthing rod of dimensions 15mm thickness and 1.8 meter length, which is buried into the ground.
- On the bottom of earthing rod, one copper plate of dimensions 300mm x 300mm should be connected. RTDAS data logger enclosure should also be grounded with local earthing.
- A pit of 4-5 feet depth, 2' X 2' wide at bottom (like a cone shaped pit) has to be dug. After leveling the bottom of the pit, uniform layer in the sequence of 6 inches of Salt + 6 inches Charcoal + 6 inches Sand is filled. Such sequence is repeated 3 times till the earth pit is filled to the top. The copper Earthing rod is placed in the center of the pit. The pit is closed and leveled.

### **Painting**

- The tower, fencing angles, chain-link fencing and gate should be properly painted every year to avoid rusting.
- All concrete foundations shall be painted using white cement paint every year.

## **Chapter-5: Technical Specification of Sensors**

### **5.1 Radar Type Water Level Sensor (60m)**

**FUNCTIONAL REQUIREMENT:** To measure the water level

**DESIGN REQUIREMENTS:** The equipment offered should conform to the following technical Specifications:

Feature	Value
<b>Site Conditions</b>	
Ambient Temperature	From -5 to +60 Degree Celsius
Humidity	0 to 100 %
Altitude	0 to 2500 meter
<b>Sensor</b>	
Sensor Type	Microwave non-contact sensor
Range	60 meters
Resolution	3 mm or better
Accuracy	0.02 % FSO
Output Interface	SDI-12 / RS-485 / 4-20mA
Power Supply	To be powered by Solar Panel provided by bidder with DCP
Beam angle	Less than 16 degree.
<b>General Features</b>	
Housing Material	Corrosion Resistance (Stainless steel / die cast Aluminum/ PVC /UV stabilized ABS with metal casing”
Enclosure	The Sensor shall be easy to dismount and replace in the event of malfunction.
Tools	Complete tool kit for operation and routine maintenance
Manuals	Full Documentation and maintenance manual in English
Accessories	Sensor Mounting support, cables and other accessories as required
Protection	IP65 or better
Horizontal Mounting/Installation Arrangements	Above FRL, below a bridge girder wherever available otherwise horizontal cantilever arrangement from a mast/wall/pedestal to be provided
Radar Sensor should have inbuilt diagnostic feature & averaging function	

### **5.2 Surface Velocity Radar(60 m)**

**FUNCTIONAL REQUIREMENT:** To measure the water surface velocity and calculate the discharge.

**DESIGN REQUIREMENTS:** The equipment offered should conform to the following technical Specifications:

Feature	Value
<b>Site Conditions</b>	
Ambient Temperature	From -5 to +60 Degree Celsius
Humidity	0 to 95 % non-condensing
Altitude	0 to 2500 meter
<b>Sensor</b>	
Sensor Type	Microwave non-contact sensor
Distance to water	60 meters
Velocity measurement Range	Up to 15 m/s (Configurable)
Resolution (Velocity)	2 mm/s or better
Accuracy (Velocity)	± 2% FSO
Output Interface	SDI-12 / RS 485 / 4-20mA
Power Supply	To be powered by Solar Panel provided by bidder with DCP
Beam angle	Less than 16 degrees.
<b>General Features</b>	
Housing Material	Corrosion Resistance (Stainless steel / die cast Aluminum/ PVC / <b>UV stabilized ABS with metal casing</b> )
Enclosure	The Sensor shall be easy to dismount and replace in the event of malfunction.
Tools	Complete tool kit for operation and routine maintenance
Manuals	Full Documentation and maintenance manual in English
Accessories	Sensor Mounting support, cables and other accessories as required
Protection	IP67 or better
Horizontal Mounting/Installation Arrangements	below a bridge girder wherever available otherwise horizontal cantilever arrangement from a mast/wall/pedestal to be provided
Sensor shall have facility of bidirectional flow measurement	
Bidder may propose combine Water Level Sensor and Velocity sensor confirming all above specifications of both sensors.	

### 5.3 Water Quality Monitoring system

Following are the minimum features/specifications and suppliers may also quote for instrument with additional features.

- The instrument shall be capable of working in fresh, polluted or muddy water.
- The instrument shall be capable of operating in water depths at least up to 60 meters.
- The instrument shall be capable of operating in a self-powering mode from an internal power supply using a set of eight (8) “C” cell batteries for at least 45 days (or more) with a full sensor payload at a 15 minute sampling interval.
- The instrument shall also have the capability of being powered by an external 12VDC power supply through an interface cable.

- Batteries shall be removable via an external hatch without opening the Sonde.
- The battery compartment must be sealed and protected by a safety device that protects the operator from a gas pressure build-up in the battery compartment.
- The instrument shall have a non-volatile flash disk memory capable of storing 150,000 individual readings as a standard. Loss of battery power shall not cause loss of memory, and a memory backup battery shall not be required.
- The instrument shall have the capability of updating its internal software with newer versions via a disk in the field by the end user, or from the web.
- The instrument shall be provided with portable field displays for calibrating, configuring, reporting and logging status **as an optional item**. It should be possible to download the data to this portable field display utilizing Kermit protocols and then transferred to a PC.
- be capable of being removed without opening the Sonde or exposing the internal electronics to the environment.
- As a minimum the instrument should monitor the following parameters
- Temperature, DO, pH, ORP, Turbidity, conductivity, Salinity
- All optical sensors must have their own dedicated wiping system for anti-fouling protection and improved data quality.
- The instrument shall include as standard RS-232 /RS-485/SDI-12 communication interface.
- Calibration solutions for all the supplied sensors should be quoted with the instrument.

## Parameters and sensors Specification :

### Temperature

Sensor Type	Thermistor
Range	-5 to 45 °C
Accuracy	+/- 0.2 °C
Resolution	0.2 °C

### Dissolved Oxygen, mg/L

(Calculated from % air saturation, temperature and salinity)

Sensor Type	Optical, Luminescence Lifetime
Range	0 to 50 mg/L
Accuracy	0 to 20 mg/L, +/- 1 % of the reading or 0.1 mg/L, whichever is greater 20 to 50 mg/L, +/- 15 % of the reading; Relative to Calibration Gases.
Resolution	0.01 mg/L

### pH

Sensor Type	Glass combination electrode
Range	0 to 14 units
Accuracy	+/- 0.2 units
Resolution	0.01 units

## **Turbidity**

Sensor type	Optical, 90 scatter, with <u><b>Automated sensor cleaning mechanism</b></u>
Range	0 to 4000 NTU
Accuracy	+/-5% of the reading or 0.5 NTU (whichever is greater).
Resolution	0.1 NTU

## **Conductivity**

Sensor Type	4 electrode cell with auto-ranging
Range	0 to 100 mS/cm
Accuracy	0.5% of reading + 0.001 mS/cm
Resolution	0.001 mS/cm to 0.1 mS/cm (range dependent)

## **5.4 Data Collection Platform**

### **Functional Requirement**

1. The system shall automatically collect the observations from attached sensors, process and store them into its memory and transmit through VSAT communication link to central station as per the pre-programmed measurement interval, and also system shall transmit hourly basis data of every full hour IST to the ERS through satellite at pre-programmed transmission time
2. The DCP shall also continuously monitor the status of the instruments, power supply and communication. In the event of failure of an instrument or disruption of any of the power sources, an alarm shall be sent back to the State data center.
3. The sensor's signal conditioning unit should be an integral part of the system.
4. The number of analog/ digital/ SDI /RS-232 / RS-485 channels in the data logger must be compatible to the sensors being supplied and also for other battery monitoring systems
5. The System shall have provision to easily include and change the following information in field as mandatory requirements:
  - Unique station identification code.
  - Time of observation.
  - Sensor identification
  - Data transmission time for VSAT communication
  - Programmable Sensor data measurement interval
  - Gain, offset, Datum parameterization for all sensors
6. The system shall have an integrated microprocessor-based data acquisition and storage system having adequate hardware configuration and software support to serve as an interface between sensors and the communication link to perform tasks as stated below.
7. Providing necessary electrical power to the sensors and conversion of electrical output signals from the sensors into engineering value based on calibration information stored in the memory. Full compatibility with all types of sensors provided in the package shall be mandatory.



8. Storage of observed data along with time for all the parameters in the memory. Memory capacity to retain at least 365 days data is required. Data shall be available even if the power supply to the system has failed (RAM Backup battery) for one year
9. The stored data shall be retrievable via serial port to a PC/ laptop or USB device.
10. Full compatibility with all types of sensors provided in the packages shall be mandatory.
11. The system should be stand alone and all programming functions / setups to be carried out through system keypad and display independent of a PC / Laptop.
12. The system should be capable of continuous updating of the values of sensed parameters and post processing the instantaneous values into average values over a specified period of time for transmission to the DCP with earth receiving station.
13. Management of DCP transmitter to optimize the battery consumption
14. The system shall support the following functions:
  - Easy programming set up.
  - Multi-tasking capability.
  - User friendly software programming.
  - The system shall have self-diagnostic facility and be capable of displaying station ID / sensor ID code and messages of the display panel for general identification of the fault. It should have facility to monitor these codes and other health status through an external laptop / PC.
  - Setup shall be organized in a tree of menus and submenus. Protection of setup parameters and data through password should be supported by the system. In addition, the DCP shall support the manual entry of data through keyboard and its display.
  - Data including the setup and program files shall be transferrable from the system via. A serial port to PC and SD card or other suitable memory device and vice versa. The scripts / software for configuration of data logger should be part of supply
  - Facility for Pooling of data via VSAT shall available in data logger
15. The DCP shall be housed in a weather proof and temper proof housing of NEMA 4 or equivalent type enclosure of steel or fiber glass.
16. DCP Should be supplied with Software for configuration and troubleshooting
17. The data logger shall be programmable locally in field via laptop / PC.
18. The DCP shall be located in a place specified by the Engineer-in-charge at each site and shall be generally one meter above Highest Flood Level (HFL) attained at that site. The DCP at each site shall be located in such a way it is easily approachable even in floods.
19. The surge suppression in form of fuse or other appropriate device shall be provided for all interfaces to protect the data logger from the surges emanating from the sensor.
20. Data logger shall have a provision to display, store and transmit the water level with respect to MSL or with respect to zero level/bed level (user selectable).
21. The data logger shall store data in memory, in case of VSAT communication failure. The data shall be transferred automatically once VSAT communication is retained. This will ensure no data loss during no communication also.

#### 5.5 Data logger with 8 AI Channels

Feature	Value
<b>Site Conditions</b>	
Ambient Temperature	From -5 to 40 Degree Celsius
Humidity	5 to 100 %
Altitude	0 to 2500 meter
<b>Sensor Interface</b>	
Analogue Inputs	8-Analogue Input Channels 4 to 20 mA, 100% over range withstand

	(Analog input channels are required in data logger, if any sensor offered by bidder requires Analog interface to integration with data logger)
SDI Port	One SDI-12 Interface port
Serial Port for sensor interface	a)One RS-485 for sensor Interface port b)One RS-232 for sensor Interface
Pulse Input	1 Input for Rain Gauge impulse
<b>Input - Output Interfaces</b>	
Data Transfer	USB stick option for Data transfer
Port for Configuration	One Serial Port (RS-232) for communication with Laptop for programming
Port for Telemetry	Ports for Communication with VAST Telemetry
Display Port	Port for connecting external display screen for data in running text
<b>Computer Software</b>	
Operating System	Windows software for system configuration / communication
Version	English language version
Licenses	All required licenses shall be included
<b>Analog to Digital Converter</b>	
Resolution	16 bit or better
Conversion Accuracy	$\pm 1$ LSB
Sample intervals	1 Sec to 24 hours (user scalable)
<b>General Features</b>	
Flash Memory	Non-volatile flash memory that can one store one year of data and expandable to a minimum of 1 GB Via USB/SD Card.
Resolution	A/D resolution $\geq 16$ bit
Recording Interval	Individual recording intervals for each sensor/parameter
Firmware Operating System	Multi-tasking operating system - must log data and transmit at same time
Display	Inbuilt Digital Display for viewing current data and setting values
Power Supply	Shall be powered by solar Power supply to be provided by bidder with DCP, low current drain (quiescent $\leq 10.0$ mA)
Battery Voltage	Monitoring of battery voltage level
Internal battery	Internal battery backup for clock, lithium battery, storage 2 years
Charge Controller	Internal or External
User Permissions	Different user levels, system of user rights / passwords, access restricted to unauthorized personnel
Internal clock	Internal clock with drift less than 1 second per Week
Keypad	For displaying or transferring data to memory stick, configuration of data logger and sensors
Real time clock	GPS synchronized& timing in IST format required
System integrity	System integrity check procedures

Enclosure	for wall-mounting in a shelter / enclosure with IP65 (NEMA 4or equivalent) protection or better
Accessories	Serial cable + adaptor (if required)for notebook connection. All accessories (fixing units, etc.) as required
Tools	complete tool kit for installation and routine maintenance giving full detail (number of pieces and type)
Manuals	full documentation and maintenance instructions in English (1 copy per station).

<b>VSAT Equipment</b>	
Operating Temperature	From -5 to +50 °C
Performance	Data Reception availability of 95% or better
<b>Antenna System</b>	
Frequency	Ku / Xc band
VSWR	1.3: 1 max.
Antenna Aperture	≤ 1.2 meter
Polarization	Linear orthogonal
Azimuth Range	360 ° continuous
Elevation Range	10°-90° continuous
Polarization Range	±95° continuous
Tx.X-Pol Isolation	On-axis – better than 30 dB
Rx.X-Pol Isolation	On axis – better than 30 dB
Off axis Tx and Rx radiation pattern	As per ITU-R recommendation S.580-6
<b>RFT &amp; LNBC</b>	
Conversion Gain	To be specified by supplier
Noise temperature	90 K or better
Gain Flatness	±1.0 dB full band
Gain Slope	+0.6 dB per 40 MHz max.
Spurious at rated P1dB	ETSI, CCIR & FCC compliant
Harmonics at rated P1dB	ETSI, CCIR & FCC compliant
<b>Modem</b>	
Output Interface	Ethernet port
Modulation	QPSK / OQPSK
Burst Data rate	128, 256, 512 Kbps
Data Transport Protocols	TCP/IP and UDP
Bit Error Rate support	Better than $1 \times 10^{-7}$
FEC rate support	½, 2/3, or better

Access technology for Inbound	TDMA/FTDMA/MFTDMA
Access Schemes on Inbound	Slotted ALOHA, dynamic access.
Management from NCC	Using SNMP
IP Routing Support	ARP, ICMP, IGMP, Routing (RIP v1 & v2), NAT, PAT

## 5.6. SOLAR POWER SUPPLY WITH BATTERY BACKUP

### Solar Power Supply

Solar Panel mounting hardware shall be designed to allow a great variety of attachment methods and accommodate a variety of mounting surfaces. They may be used to mount a module on a horizontal or vertical surface, on surfaces at angles between horizontal and vertical and on metal poles. Attachment methods include bolts, lag bolts, u – bolt brackets and stainless-steel hose clamps.

The Solar power supply shall be mounted on the roof of site buildings where existing. The Bidder shall supply a pole – mounted arrangement including a standard pole and necessary foundation and fixing arrangements. The location of solar power installation shall be indicated by the concerned engineer – in – charge of each DCP.

In order to guard against frequent theft of solar panels the mounting device shall be so designed as to make the solar panel detachable as and when required. It is intended to store the solar panel during the night hours as well for longer durations in the non-monsoon period and the arrangement should be designed in such a way that the arrangement is sturdy and capable of handling frequent disconnecting and re connections. The power supply shall primarily function through a set of sealed maintenance free rechargeable batteries capable of preventing deep discharge.

### Batteries

The batteries required for the equipment above shall be maintenance free, rechargeable sealed batteries with the following features:

- Overcharge and deep discharge protection
- Leak-proof
- Easy handling – no special shipping container required
- Long service life
- Excellent recharge ability

One battery pack shall be provided for each DCP. The batteries pack provided shall have adequate capacity to sustain the maximum sized DCP configuration of sensors and telemetry equipment for a period of 5 days of continuous operation at the frequency of one observation per hour per sensor and one transmission per hour on a 24-hourly basis. This capacity shall always be available, if it not, battery pack should be replaced with new one free of cost.

The necessary housing and configuration of the batteries shall be furnished in detail by the Bidder.

The battery pack shall also include arrangements of charging through a standard 220 V AC domestic power supply outlet and also from solar panels established as above. The normal supply to the DCP equipment shall be from battery pack only. The Power system unit shall have audio and/or visual alarms for overcharging and deep discharging conditions. The charge level shall also be indicated on the front panel of the pack. The sealed construction shall allow trouble-free, safe operation in any position. The battery case shall be high-impact, with sufficient resistance to shock, vibration, chemicals and heat.

## Solar Power supply for DCP

Solar panel offered should confirm the following technical specifications:

Feature	Units
<b>Battery</b>	
Voltage	From 0 to +60 V
Type	Sealed maintenance free
Capacity	Based on site conditions and telemetry method, power supply system shall provide 5 days of backup to all equipment's being powered up by the solar panel (The minimum capacity of Battery should be 200AH at 12VDC)
<b>Solar Panel</b>	
Size	Based on site conditions and telemetry method, power supply system shall provide 15 days of backup to all equipment's being powered up by the solar panel (The minimum size of solar panel should be 150W)
Mounts	The mounts should be detachable but should not move or rotate with wind. It should have a provision to adjust direction and elevation during installation for optimal solar power generation
Charger	Smart solar charger with protection shall be provided by the bidder
<b>General</b>	
The supplier should determine optimal size of solar panels and batteries such that the system should be operational for at least 5 days in absence of charging.	

## Data downloading machine specifications:

<b>1</b>	<b>Processor</b>	<b>Intel Core™ i7</b>
<b>2</b>	Graphics	DDR3 Graphics memory capacity 4 GB, Graphic processor NVIDIA GeForce 920M
<b>3</b>	Memory	16GB Dual Channel DDR3L 1600MHz (8GBx2)
<b>4</b>	Hard disk	2 TB 5400 rpm (min.) SATA
<b>5</b>	Display	15.6-inch HD (1366 x 768) True life LED-Backlit Display
<b>6</b>	Resolution	1366 x 768WXGA
<b>7</b>	Video Controller	Integrated GMA 900 series with 128 MB Share Memory
<b>8</b>	Wireless Connectivity	Integrated wireless Intel 802.11a/b/g, Integrated Bluetooth
<b>9</b>	DVD Writer speaker	Integrated DVD writer 8x and Integrated Stereo
<b>10</b>	Key Board	Key Board with Touch pad
<b>11</b>	Expansion Port	4 USB, 10/100 Ethernet card, RGB or video or VGA, PCMCIA/PCI Express slot, Microphone, Stereo Headphone & other standard features.
<b>12</b>	Operating System & Software	Microsoft Windows 10, MS Office 2010 and Norton/McAfee/e- Antivirus Software latest version & other software. All software with media and with licensed updation equal to the warranty period of the entire network

<b>13</b>	Power Supply	230V, 50 Hz AC Supply with rechargeable Battery Pack comprising of Li-ION battery Suitable for approx. 4 hrs. Operation complete with battery charger/adaptor.
<b>14.</b>	Carry Case	To be provided of superior quality.
<b>Note: Data downloading machines (desktops) shall be of branded make (Preferably Dell or H.P)</b>		

## TRAINING AND DOCUMENTATION

The contractor shall provide trainings at the specified/scheduled locations as training modules as part of the tender given as under:

<b>Sl. No.</b>	<b>Module Name</b>	<b>Target Group</b>	<b>Duration in days</b>
<b>1</b>	Remote Station Management and Maintenance	All W/C staff located at Remote Stations	3
<b>2</b>	Trouble shooting of sensors at Site	Junior Engineers	3
<b>3</b>	Management of DCU through Laptop and Calibration of sensors	EE /AEE/SDE/JE	3

All aspects of the electrical, instrumentation and telemetry equipment being supplied shall be covered in the courses and full documentation shall be provided. The documentation and kits shall be got approved from purchaser in advance. The course shall provide detail documentation and shall ensure that the Purchasers personnel shall be able to modify settings/parameters without reference back to the Supplier.

The places / sites where this training is to be given will be decided later by the Purchaser.

## Chapter-6: Price Schedule

Technical Bid (To be furnished offline only. Offline bids are not acceptable under this contract)

1.	Name and Postal Address of the Bidder	Phone: Mobile: Fax: Email:
2.	Is your concern Recognized/Registered      Yes <input type="checkbox"/> No <input type="checkbox"/> (Attach Photocopy as a proof)	
	Tick as applicable Recognised by Govt. of india Registered under Companies Act Registered under Shops and Establishment act Registered as firm Proprietorship/Any other category(please specify) Sister concern of.....(please specify name)	
3.	Income Tax return filed (Attach proof)	
4.	Income Tax Permanent Account Number (PAN)(Attach proof)	
5.	Service Tax Registration number (Attach proof)	
6.	Experience (attach performance certificate from the Govt./ PSU Companies/Public Agencies/Firms): .....Years	

Sl.No.	Particulars	To be filled by the tenderer
1.	Name of the Agency	
2.	Date of establishment of the agency	
3.	Detailed office address of the Agency with Office Telephone Number, Fax Number and Mobile Number and name of the contact person	
4.	Whether registered with and holding license from all concerned Government Authorities including registration under Contract Labour (Regulation & Abolition) act, 1970. (Copies of all certificates of registration to be enclosed)	
5.	PAN/TAN Number (copy to be enclosed)	
6.	Labour License Number (copy to be enclosed)	
7.	Service Tax Registration Number (copy to be enclosed)	
8.	Whether the firm is blacklisted by any Government Department or any criminal case is registered against the firm or its owner/partners anywhere in India. (If no, a certificate is to be attached in this regard)	
9.	Length of experience in the field	
10.	Experience in dealing with Govt. Departments (indicate the names of the Departments and years of dealing with those Departments and attach copies of contract orders placed on the agency)	
11.	Whether agency profile is attached	
12.	List of other clients	
13.	Financial turnover of the tendering company/firm/agency for the last 2 financial year with supported documents (copy of balance sheet, duly certified by Auditors/CAs to be attached)	
14.	Whether any show cause notice was ever issued by the Office of the Labour Commissioner or any Government Agency? If so, details thereof (please attach the copies of communications, if any).	

Signature of the bidder with seal

**Technical Bid****Check List**

The Tenderers should meet the following Eligibility Criteria for quoting the tender and the proof for the Eligibility should be provided in the Technical Bid.

A copy of this check list with Page Numbers to be enclosed.

<b>Sl. No.</b>	<b>Minimum Eligibility Criteria</b>	<b>Proof to be submitted for fulfilling the Eligibility</b>	<b>Page No.</b>
1.	Agency/ bidders should be original equipment manufacturer of equipments/Authorized supplier and should have at least 3 years experience in the field of providing similar program management Services to Govt. organizations/ PSUs/ State Govt. / Quasi Govt. organizations/ Research Organizations in India or abroad. Copy of supporting documents should be attached.	Documentary proof of being equipment manufacturer/authorized supplier of Water level & water quality sensor/Telemetry equipments and having 3 years experience in the related field to be attached.	
2.	The bidders should have completed at least 2 similar contracts of annual value of not less than INR.40.00 lakhs each or equivalent during the period of last 5 years in the Ministries/ Department of Ministries/ CPWD/ MES/ Railways/ PSUs/ State Govt. / Quasi Govt. organizations/ Research Organizations in India or abroad.	Copy of Satisfactory Performance certificates to be attached	
3.	The tenderer's annual gross turnover should be INR 3.00 Crore per annum or equivalent for the last three years.	Tenderer should enclose the Audited Balance Sheet for the last three years.	
4.	The domestic original equipment manufacturers should be registered under the Service Tax Rules, 1994. In other cases, import – export rules and other relevant rules shall apply.	The domestic tenderer should submit a copy of TIN registration certificate to this effect. The non-domestic tenderers should submit an undertaking that they will comply to all Indian rules, as applicable	
5.	The domestic firm should be income tax assessee for last three years.	Copies of Income tax returns for last 3 years and PAN/TAN Card should be enclosed.	
6.	Earnest Money Deposit	The Tenderer should enclose demand draft etc drawn on any scheduled bank for Rs. <b>1, 27, 000</b> or equivalent drawn in favour of EE, UBD, CWC.	



### Other Enclosures

Sl. No.	Item	Page No.
A.	Letter of Transmittal	
B.	Copy of Registration Certificate	
C.	Copy of Articles of Association	
D.	Copy of Bye-Laws	
E.	Sources & pattern of Income & Expenditure	
F.	Brief organizational profile, including background and experience of the firm	
G.	Previous project summaries, including reference contact information, for a minimum of three (3) projects which are Govt. management projects described herein which demonstrate pertinent corporate and key personnel experience; listing of the pertinent projects may be included. (CWC reserves the right to contact any references provided herein or otherwise obtained);	
H.	Execution Plan and potential Project Schedule including an explanation / discussion of technical approaches and a detailed outline of the proposed services for executing the requirements of the Proposed Scope of Services (please note that the document(s) is expected to be delivered in hard copy);	
I	Project management including: i. Project organizational chart including key staff to be assigned ii. Location of office from which the management of the project will be performed	
J	Cost estimates and typical billing rates (In a separate sealed envelope): Financial Bid	

### ***Important Instructions to the bidders: -***

- 1. The system installed for Real Time data Monitoring System must be compatible with technical specifications of ISRO and CDAC for 'Development of web portal, secure hosting and data integration.***
- 2. There will be VSAT communication from remote station to UBD, Dibrugarh from where data to CDAC will be through ftp. VSAT communication will be in addition to DRT based satellite communication from remote station to Earth station New Delhi/Jaipur from where data will be communicated to FFM, UBD through existing VSAT and to CDAC through ftp.***
- 3. The location of State Data Centre will be finalized later.***
- 4. Equipments, Sensors, Instruments etc. to be supplied by the Firm shall meet the requirements as per Technical Specifications of Sensors (Chapter-5) mentioned in the Tender document. Sensors specifications will be scrutinized during evaluation of Technical bid.***
- 5. Bids not fulfilling the technical requirements will be summarily rejected.***

**Appendix-B**

**FINANCIAL BID FORMAT**  
**Table-A**  
**(The rates may be quoted in Indian Rupees only)**

Sl. No.	Name of Item	Quantity	Rate in Rs	Amount in Rupees	
				In Figures	In Words
1	Supply, Installation, testing and commissioning of Water Quality (pH, DO, Electrical Conductivity, Turbidity & temp.) sensors complete with accessories	1			
2	Supply, Installation, testing and commissioning of velocity sensors complete including accessories with measuring range of 60 metre	1			
3	Supply, Installation, testing and commissioning of water level sensors radar type (60m range) with a measuring range as below and with an accuracy of +/- 5mm complete with accessories	1			
4	Supply, Installation, testing and commissioning of real time (satellite based) data communication system and data logger with display unit with all equipments and accessories such as satellite transmitter, power supply unit including solar panel, charge regulator, batteries, lightening arrestor and earth system in NEMA 4 enclosures with all connectors and cables including integration of the system with Earth Receiving Stations (existing data logger will be used at ERS)	2			
5	Spare Parts- Solar Power System including solar Panel, Charge Regulator	1 Set			
6	Data downloading machine	1 No.			
7	Comprehensive annual maintenance charges including replacement of material and consumables for 5 years after warranty period of 2 years @ 3 % per annum of the equipment cost.	L.S.			
8	Training in field (as per requirement mentioned in Tender document)	1			
9	Civil Works for fixing of DCP/ Radar on mast/wall/ bridge deck/ slab, conduit pipe including construction of triangular tower/mast/ concrete tower in river bed etc. complete.	1			
	a) Fencing as per estimate				
	b) Hutments for housing DCU etc. as per Estimate	1			
	Sub-Total				
	GST (18%)				
	Grand Total				

## Contract Form

### CONTRACT AGREEMENT FORM

**THIS AGREEMENT** made on the.....day of.....20.....between Executive Engineer, Upper Brahmaputra Division, Central Water Commission, Dibrugarh, Assam (*hereinafter "the Purchaser"*) of one part and ..... (*Name of Contractor*) of..... (*City and Country of Contractor*) (*hereinafter called "the Contractor"*) of the other part:

**WHEREAS** the Purchaser invited Tenders for certain services, viz: **Procurement, installation, Commissioning and Comprehensive Annual Maintenance of Real Time Hydrological Data Acquisition System at Tuting, Upper Siang District, Arunachal Pradesh** of Upper Brahmaputra Division, Central Water Commission, Dibrugarh, Assam and has accepted a Tender by the Contractor for the supply of services in the sum ..... (*Contract Price in Words and Figures*) (*hereinafter called "the Contract Price"*).

**NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:**

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
  2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz:
    - a. the tender form, technical bid and the price schedule submitted by the Tenderer ;
    - b. Tender document
    - c. amendments to the tender document;
    - d. Post tender opening correspondence ; and
    - e. The Purchaser's Notification of Award.
  3. In consideration of the payments to be made by the Purchaser to the contractor as hereinafter mentioned, the Contractor hereby covenants with the Purchaser to provide the services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
  4. The Purchaser hereby covenants to pay the Contractor in consideration of the provision of the services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and
- Brief particulars of the services which shall be supplied/provided by the Contractor are as under :

**TOTAL VALUE:**

**DELIVERY SCHEDULE:** Within 7 days of signing of contract.

**IN WITNESS** whereof the parties hereto have caused this Agreement to be executed in accordance with their respective laws the day and year first above written.

Signed, Sealed and Delivered by the said.....  (For the Purchaser)  in the presence of:.....	Signed, Sealed and Delivered by the said.....  (For the Contractor)  in the presence of: .....
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**TENDER ACCEPTANCE LETTER**  
(To be given on Company Letter Head)

Date:

To,  
The  
EXECUTIVE ENGINEER  
Upper Brahmaputra Division,  
Central Water Commission,  
Dibrugarh, Assam

**Sub: Acceptance of Terms & Conditions of Tender.**

**Tender Reference No:** 04/01/NIT/2019-UBD/1104-07 dt.04/06/2019

**(Tender for Procurement, installation, Commissioning and Comprehensive Annual Maintenance of Real Time Hydrological Data Acquisition System at Tuting, Upper Siang District, Arunachal Pradesh)**

Dear Sir,

1. I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely:  
\_\_\_\_\_  
\_\_\_\_\_ as per your advertisement, given in the above mentioned website(s).
2. I / We hereby certify that I / we have read the tender document of above mentioned work (including all documents like annexure(s), schedule(s), etc.), which form part of the contract agreement and I / we shall abide hereby the terms / conditions / clauses contained therein.
3. The corrigendum(s) issued from time to time by your Division/ organization, if any, too have also been taken into consideration, while submitting this acceptance letter.
4. I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirely.
5. In case any provisions of this tender are found violated, your Division/ organisation shall be at liberty to reject this tender/bid including the forfeiture of the full said earnest money deposit absolutely and we shall not have any claim/right against Division in satisfaction of this condition.

Yours Faithfully,

(Signature of the Bidder, with Official Seal)

Cost of Tender Document Rs.1000/-

(Tender No. .... Dated .....)

**GOVERNMENT OF INDIA**  
**CENTRAL WATER COMMISSION**  
**UPPER BRAHMAPUTRA DIVISION**

This Tender document contains 53 pages

Issued to :

Date of receipt of tender fee :

Date of issue :

Signature of the issuing

Authority :