

# **PROCUREMENT OF GOODS**

**Up to Shopping Thresholds**

*[Single Envelope with e-Bidding]*



**GOVT. OF WEST BENGAL**  
**IRRIGATION AND WATERWAYS DEPARTMENT**  
**NATIONAL HYDROLOGY PROJECT**  
**WORLD BANK FUNDED**

**INVITATION FOR BIDS (IFB)**  
**SHOPPING FOR GOODS**

Memo No : 246 / NHP-02 / 02

Date 21/06/2019

**Bid No: WBIW/NHP/IFB-03/2019-20**

Procurement Plan Ref. No: NHP-2018-2019-WBSW-664351-GO-SH-SCB

1. The Government of India has received financing from the World Bank toward towards the cost of National Hydrology Project and intends to apply part of the proceeds toward payments under the contract for which this Invitation for Bids is issued. **Bidders are advised to note the minimum qualification criteria specified in the Bidding Documents in order to qualify for the award of the Contract.** In addition, they may also refer to paragraphs 1.6 and 1.7 of the World Bank's Guidelines: *Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers - January 2011, revised July 2014* setting forth the World Bank's policy on conflict of interest.
2. *The Executive Engineer, Burdwan Investigation & Planning Division I&W Department, Govt of West Bengal invites bids electronically from eligible bidders for:-*

**“Supply, Installation, Testing and Commissioning of Surface Velocity Radar and Water Level Radar for real time monitoring of river discharge including comprehensive Annual Maintenance Contract for 4 years under National Hydrology Project”**

| Brief Description of the Goods  | Specifications                              | Qty.   | Period of supply | Place of Installation                  |
|---|---|--------|------------------|--|
| <b>Supply of SVR, AWLR and all accessories for real time discharge monitoring</b> | As per Technical specifications given below | 2 sets | 120 Days         | As per location details provided below |

3. The Bidding Document is available online and can be downloaded free of cost by logging on to the website [www.wbiwd.gov.in](http://www.wbiwd.gov.in) (the official website of Irrigation & Waterways Department) and click the “e-procurement” link provided therein or from [www.wbtenders.gov.in](http://www.wbtenders.gov.in). The e-tender can be searched by typing WBIW/NHP in the search engine provided in the website/s. The bids are to be submitted online through the same e-procurement portal only. Bids submitted manually will not be accepted. The bidders would be required to register in the website which is free of cost.
4. For submission of the Bid, the Bidder is required to have Digital Signature Certificate (DSC) from one of the Certifying Authorities authorized by Government of India for issuing DSC. Aspiring bidders who have not obtained the user ID and password for participating in e-procurement in this Project, may obtain the same from the website: [www.wbtenders.gov.in](http://www.wbtenders.gov.in).
5. Bids must be accompanied by Bid Security for the amount and in the form specified in the Bidding Document. Bid security shall have to be valid for 45 days beyond the validity of the bid. Bids should be valid for 90 days after the deadline date specified for submission. Procedure for submission of Bid Security is described in Para 7 below.
6. Bids must be submitted on [www.wbtenders.gov.in](http://www.wbtenders.gov.in) on or before **15:00** hours on **11.07.2019** and will be opened online on **11.07.2019 at 15:30** hours. Record of bid opening will be electronically shared with bidders. If the office happens to be closed on the date of opening of the Bids as specified, the Bids will be opened on the next working day at the same time and venue. Any bid or modifications to bid (including discount) received outside e-Procurement System will not be considered. The electronic bidding system would not allow late submission of bids.
7. The Bidders are required to submit the specified original documents including original Bid Security in approved form with The Executive Engineer, Burdwan Investigation & Planning Division at the address given below before the date and time specified for opening of the Bids, by registered post/speed post/courier or by hand, failing which the Bids will be declared non-responsive and will not be opened.
8. Other details can be seen in the bidding documents. The Purchaser shall not be held liable for any delays due to system failure beyond its control. Even though the system will attempt to notify the bidders of any bid updates, the Purchaser shall not be liable for any information not received by the bidder. It is the Bidder’s responsibility to verify the website for the latest information related to the Bid.

**Name and address of Purchaser**

Name: Executive Engineer, Burdwan Investigation & Planning Division, I&W Department

Address: Purta Bhavan, 3<sup>rd</sup> Floor, Purba Bardhaman, 713103, West Bengal

Tel. No: 0342 2646799, Mail id: [eebipd2012@gmail.com](mailto:eebipd2012@gmail.com)

**NATIONAL HYDROLOGY PROJECT**  
**WORLD BANK FUNDED**  
**Invitation for Bids for Goods under Shopping**

1. *The Executive Engineer, Burdwan Investigation & Planning Division I&W Department, Govt of West Bengal* invites Bids which shall be submitted in the e-Procurement Portal for the following :

**“Supply, Installation, Testing and Commissioning of Surface Velocity Radar and Water Level Radar for real time monitoring of river discharge including comprehensive Annual Maintenance Contract for 4 years under National Hydrology Project” (Bid No: WBIW/NHP/IFB-03/2019-20)**

2. Detailed Invitation for Bid is available on [www.wbiwd.gov.in](http://www.wbiwd.gov.in). The Bidding Document is also available online and can be downloaded free of cost by logging on to the website [www.wbiwd.gov.in](http://www.wbiwd.gov.in) or [www.wbtenders.gov.in](http://www.wbtenders.gov.in)
3. The deadline for submission of Bids is **11.07.2019 at 15:00** hours. Bids will be opened on **11.07.2019 at 15:30** hours.
4. Bidders are advised to note the minimum qualification criteria specified in the bidding documents. Interested Bidders may participate in the bidding process as per instructions given in the Bidding Documents.

The Executive Engineer  
Burdwan Investigation & Planning Division  
Irrigation & Waterways Directorate Govt. of West Bengal  
Purta Bhawan, 3<sup>rd</sup> Floor Purba Burdwan-713103, West Bengal  
e-mail: [eebipd2012@gmail.com](mailto:eebipd2012@gmail.com)

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## **PART 1 – BIDDING PROCEDURES**

### **SECTION 1 - INSTRUCTIONS TO BIDDERS**

# Section 1 - Instructions to Bidders (ITB)

## A. General

- 1. Scope of Bid** 1.1 The Purchaser, namely Executive Engineer, Burdwan Investigation & Planning Division issues these Bidding Documents for the supply of Goods and Related Services as specified in Section 3, Schedule of Requirements. The name and identification number of this Shopping procurement is **WBIW/NHP/IFB-03/2019-20**
- 2. Source of Funds** 2..1. Purchaser intends to apply a portion of the funds from the World Bank to eligible payments under the contract for which these Bidding Documents are issued.
- 3. Eligible Bidders** 3.1 A Bidder shall not have a conflict of interest. All bidders found to have conflict of interest shall be disqualified. For further details, the Bidder may refer to Clauses 1.6 and 1.7 of the World Bank's Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, January 2011, revised July 2014.
- 4. Corrupt and Fraudulent Practices** 4..1. The World Bank requires compliance with its policy in regard to corrupt and fraudulent practices as set forth in Section 6.

## B. Preparation of Bids

- 5. Documents Comprising the Bid** 5.1 The Bid shall comprise the following:
  - (a) Letter of Bid and the Price Schedules, in accordance with ITB Clauses 6, 8 & 9;
  - (b) Bid Security in accordance with ITB 13;
  - (c) Written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 14.2;
  - (d) Documentary evidence in accordance with ITB Clause 10 that the Goods and Related Services conform to the Bidding Documents;
  - (e) Documentary evidence in accordance with ITB Clause 11 establishing the Bidder's qualifications to perform the contract if its bid is accepted;
  - (f) Manufacturer's Authorization in accordance with ITB Clause

- 11.1 (a), on the form provided in Section 2;
- (g) Performance Statement of supplies of similar goods made during the last 3 years, in accordance with ITB 11.2;
  - (h) List of Goods & Related Services indicating Bidder's offered delivery period, on the form given in Section 3.
  - (i) Affidavit confirming correctness of information and documents submitted with the Bid, as per format given in Section 2; and
- 6. Letter of Bid and Price Schedules** 6.1 The Bidder shall submit the Letter of Bid & Price Schedules using the forms furnished in Section 2, Bidding Forms. The forms must be completed without any alterations to the text. All blank spaces shall be filled in with the information requested.
- 7. Alternative Bids** 7.1 Alternative bids shall not be considered.
- 8. Bid Prices and Discounts**
- 8.1 The prices and discounts quoted by the Bidder in the Letter of Bid and in the Price Schedules shall conform to the requirements specified below.
  - 8.2 All lots (Contracts) and items must be listed and priced separately in the Price Schedules.
  - 8.3 The price to be quoted in the Letter of Bid shall be the total price of the Bid, excluding any discounts offered.
  - 8.4 The Bidder shall quote discounts, if any and indicate the methodology for their application in the Letter of Bid.
  - 8.5 Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account. A Bid submitted with an adjustable price quotation shall be treated as non-responsive and shall be rejected.
  - 8.6 If so specified in ITB 1, bids are being invited for individual lots (contracts) or for any combination of lots (packages). Prices quoted shall correspond to 100 % of the items specified for each lot and to 100% of the quantities specified for each item of a lot. Bidders wishing to offer discounts for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITB 8.4 provided the bids for all lots (contracts) are opened at the same time.
  - 8.7 Prices shall be quoted as specified in the Price Schedule included in Section 2, Bidding Forms as stated below:



- (i) The price of the Goods quoted EXW (ex-works, ex-factory, ex-warehouse, ex-showroom, or off-the-shelf, as applicable), including other taxes which will be payable on the Goods if the contract is awarded to the Bidder including the price for inland transportation, insurance, and other local services required to convey the Goods to their Final Destination (Project Site), price for related services, if any; and;
  - (ii) Goods and Services Tax (GST)
  - (iii) The basic price quoted will remain unchanged during the tenure of the contract while the GST amount is subject to government decisions.
- 9. Currencies of Bid**      9.1      The Bidder shall quote in Indian Rupees only.
- 10. Documents Establishing the Conformity of the Goods and Related Services**      10.1      To establish the conformity of the Goods to the Bidding Documents, the Bidder shall furnish as part of its Bid the documentary evidence that the Goods conform to the technical specifications and standards specified in Section 3, Schedule of Requirements.
- 11. Qualifications of the Bidder and Documentary Evidence**      11.1      The documentary evidence of the Bidder's qualifications to perform the contract if its bid is accepted shall establish to the Purchaser's satisfaction:
- (a) (i) that if a Bidder that does not manufacture or produce the Goods it offers to supply, it shall submit with its Bid the Manufacturer's Authorization and confirmation to provide Manufacturer's warranty/guarantee for the goods along with the supply, on the form included in Section 2. The Bidder has the option to furnish the said Authorization from the Authorized Dealer or Distributor in which case, the Form provided in Section 2 may be modified by the Bidder suitably. However, if the Bidder itself is an Authorized Dealer or Distributor, it may submit Certificate evidencing this position – in lieu of Manufacturer's Authorization.
  - (ii) that supplies for any particular item in each schedule of the bid should be from one manufacturer only. Bids from agents offering supplies from different manufacturers for the same item of the schedule in the bid will be treated as non-responsive.

(b) that the Bidder meets the following qualification criterion:

The bidder should have supplied goods similar to the type (& capacity) specified in the Schedule of Requirements up to at least 50% of the quantity in any one of last 3 years. At least 50 % of the quantity in case of equipment offered for supply should have been in successful operation for at least one year as on date of bid opening.

11.2 The Bidder shall also submit with its Bid, details of supplies of similar goods made during the last 3 years preceding the deadline for Bid submission, using the Proforma for Performance Statement included in Section 2. Bidders shall invariably furnish documentary evidence (End User's certificate) in support of the satisfactory operation of the goods as specified above.

11.3 Bids from Joint Ventures are not acceptable.

11.4 Financial Capability:

The bidders should have annual sales turnover of minimum of Rs. **100 lakhs**. The Bidder shall furnish documentary evidence that it meets the Financial capability.

**12. Period of Validity of Bids**

12.1 Bids shall remain valid for the period of **90 days** after the bid submission deadline date prescribed by the Purchaser. A bid valid for a shorter period shall be rejected by the Purchaser as non-responsive.

**13. Bid Security**

13.1 The Bidder shall furnish as part of its bid, a Bid Security, in original for an amount of **INR 1,00,000/-**

Bid Security should be in one of the following forms:

- (i) A bank guarantee issued by a nationalized/scheduled bank in the form given in Section 2; or
- (ii) Certified cheque or Bank draft issued by a nationalized/scheduled bank; or
- (iii) Fixed Deposit/Time Deposit certificates issued by a nationalized/scheduled bank for equivalent or higher values are acceptable provided these are pledged in favour of the Purchaser and such pledging has been noted and suitably endorsed by the bank issuing the deposit certificates.

**The Bid Security shall be valid for forty-five (45) days beyond the original validity period of the Bid.**

- 13.2 If a Bid is not accompanied by a substantially responsive Bid Security, it shall be rejected by the Purchaser as non-responsive.
- 13.3 Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's signing the contract and furnishing the Performance Security pursuant to ITB 33.
- 13.4 The Bid Security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the contract and furnished the required performance security.
- 13.5 The Bid Security may be forfeited:
- (a) if a Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Letter of Bid, or any extension thereto provided by the Bidder; or
  - (b) if the successful Bidder fails to:
    - (i) sign the Contract in accordance with ITB 32; or
    - (ii) furnish a performance security in accordance with ITB 33.

**14. Preparation and Signing of Bid**

- 14.1 The Bidder shall prepare the Bid as per details given in ITB 15.
- 14.2 The Bid shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of Power of Attorney and shall be submitted with the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature.
- 14.3 Corrections, if any, in the bid can be carried out by editing the information before electronic submission on e-Procurement Portal.

**C. Submission and Opening of Bids**

**15. Electronic Submission of Bids, and Submission of Original**

- 15.1 Bids shall be submitted online on the e-Procurement Portal specified in ITB Clause 1. Detailed guidelines for viewing Bids and submission of online Bids are given in the website. Any Bidder can log on to this website and view the IFB and details of Works for which Bids are invited. However, every Bidder has to enrol/ register in the website, and should have valid

## Documents

Digital Signature Certificate (DSC) in the form of smart card/e-token obtained from any Authorised Certifying Agency. The Bidder should register in the website using the relevant option available. Then the Digital Signature registration has to be done with the e-token, after logging onto the website. The Bidder can then log in the website through the secure login by entering the password of the e-token & the user id/ password chosen during registration.

The Bidder should go through the Bidding Document carefully and submit the specified documents, along with the Bid otherwise the Bid may get rejected.

15.2 Bid submitted online by the Bidder shall comprise the following.

- (a) Price Schedule to be filled online (using the Schedule uploaded with the bidding documents):

Entry of Prices for items in the Price Schedule shall be made by the Bidder online. Upon entry of unit prices for all the items of Goods and Related Services, line item total and the total Bid Price would be calculated automatically by the System and displayed.

- (b) The Bidder shall upload scanned copies of the following documents with the Bid on the e-Procurement Portal.
- (i) **Letter of Bid** as per format given in Section 2;
  - (ii) **Bid Security** in accordance with ITB 13;
  - (iii) **Delivery Period Offered:** List of Goods & Related Services indicating Bidder's offered delivery period, on the form given in Section 3;
  - (iv) **Authorization:** Power of Attorney of signatory of Bid in accordance with ITB 14.2;
  - (v) **Manufacturer's Authorization** in accordance with ITB 11.1 (a), on the form provided in Section 2;
  - (vi) **Affidavit** confirming correctness of information and documents submitted with the Bid in accordance with ITB Clause 5.1, on the form provided in Section 2;

- (vii) **Performance Statement** of supplies of similar goods made during the last 3 years, in accordance with ITB 11.2;
- (viii) **Compliance of Goods and Related Services with Technical Specifications and Standards:** Documentary evidence in accordance with ITB Clause 10;
- (ix) **Qualifications of the Bidder:** Documentary evidence of Bidder's qualifications to perform the Contract in accordance with ITB 11.1; and
- (x) **Authorized address and contact details** of the Bidder having the following information:
  - Name of Firm
  - Address for communication
  - Telephone No.(s): Office
  - Mobile No.
  - Facsimile (FAX) No.
  - Electronic Mail Identification (E-mail ID)

15.3 All documents are required to be signed digitally by the Bidder. The System generates a Unique Bid Identification Number, time stamped as per server time, as an acknowledgement for Bid submission.

#### 15.4 **Submission of Original Documents**

Bidders are required to submit the following documents **in original** to the Purchaser's office.

- (i) Original Bid Security in approved form;
- (ii) Affidavit confirming correctness of information and documents submitted with the Bid, using the Format given in Section 2; and
- (iii) Original Power of Attorney.

These original documents should be received by the Purchaser **before the date and time fixed for opening of Bids**, either by registered/speed post/courier or by hand, failing which the Bid will be declared non-responsive, and will not be opened. Hard copies of Bids or any other documents are not required to be submitted.

15.5 Any Bid or modifications to Bid (including discount) received outside the e-Procurement System shall not be considered.

15.6 Bids submitted manually or by Telex, or Cable or by Fax will be rejected as non-responsive.

- 16. Deadline for Submission of Bids**
- 16.1 Bids must be uploaded online no later than **11.07.2019 by 15:00 Hrs**. A Bidder may modify its Bid any number of times by using the appropriate option for Bid modification on the e-Procurement Portal, before the deadline for submission of Bids. For bid modification and consequential re-submission, the bidder is not required to withdraw its Bid submitted earlier. The last modified Bid submitted by the Bidder within the deadline for bid submission shall be considered as the Bid. The modification and consequential re-submission of Bids is allowed any number of times.
- 16.2 A Bidder may withdraw its Bid by using the appropriate option for Bid withdrawal, before the deadline for submission of Bids.
- 17. Late Bids**
- 17.1 The electronic bidding system would not allow any late submission of Bids after due date and time as per server time.
- 18. Public Opening of Bids**
- 18.1 The Purchaser shall publicly open the Bids online in the Purchaser's office, on **11.07.2019 by 15:30 Hrs** in the presence of Bidder's designated representatives and anyone who chooses to attend, and this can also be viewed by the Bidders online. In the event of the specified date of bid opening being declared a holiday for the Purchaser, the Bids will be opened at the appointed time and location on the next working day.
- 18.2 In all cases, original documents submitted as specified in ITB 15.4 shall be first scrutinized, and Bids that do not comply with the provisions of ITB 15.4 will be declared non-responsive and will not be opened.
- 18.3 The Purchaser shall prepare a record of the Bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, per lot if applicable, including any discounts. The Bidders' representatives who are present shall be requested to sign the record of bid opening maintained by the Purchaser. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record.
- The Bid opening summary will be uploaded on the e-Procurement Portal and a copy of the same will be handed over to the Bidders' representatives present at the time of Bid opening.
- 18.4 Any Bid price, which is not declared and recorded, will not be taken into account in Bid Evaluation.

## **D. Evaluation and Comparison of Bids**

- 19. Confidentiality**
- 19.1 Any effort by a Bidder to influence the Purchaser in the examination, evaluation, comparison, and post qualification of the bids or contract award decisions may result in the rejection of its Bid.
- 19.2 From the time of bid opening to the time of Contract Award, if any Bidder wishes to contact the Purchaser on any matter related to the bidding process, it should do so in writing.
- 20. Clarification of Bids**
- 20.1 To assist in the examination, evaluation, comparison and post-qualification of the bids, the Purchaser may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder in respect to its Bid and that is not in response to a request by the Purchaser shall not be considered. The Purchaser's request for clarification and the response shall be in writing.
- 21. Responsiveness of Bids**
- 21.1 The Purchaser's determination of a bid's responsiveness is to be based on the contents of the bid itself.
- 21.2 A substantially responsive Bid is one that conforms to all the terms, conditions, and specifications of the Bidding Documents without material deviation, reservation, or omission.
- 21.3 Bids without proper agreement to furnish the manufacturer's guarantee/warranty, shall be treated as non-responsive.
- 21.4 If a bid is not substantially responsive to the Bidding Documents, it shall be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.
- 22. Correction of Arithmetical Errors**
- 22.1 The e-Procurement System automatically calculates the total amount from unit rates and quantities. The System also automatically populates the amount in words from the amount in figures and therefore there is no scope of discrepancy and need for arithmetic correction.
- 23. Preliminary Examination of Bids**
- 23.1 The Purchaser shall examine the Bids to confirm that all documents requested in ITB 15 have been provided, and to determine the completeness of each document submitted.
- 23.2 The Purchaser shall confirm that the following documents and information have been provided in the Bid. If any of these

documents or information is missing, the offer shall be rejected.

- (a) Letter of Bid in accordance with ITB Clauses 6, 8 & 9;
- (b) Price Schedules in accordance with ITB Clauses 6, 8 & 9.

**24. Examination of Terms and Conditions; Technical Evaluation**

- 24.1 The Purchaser shall examine the Bids to confirm that the Bidder has accepted all terms and conditions specified in the bidding documents without material deviations or reservation.
- 24.2 Bids offering delivery beyond the stipulated delivery will be treated as non-responsive.
- 24.3 General Conditions of Contract stipulate the payment schedule offered by Purchaser. If the Bid deviates from that schedule the Bid will be treated as non-responsive.

**25. Evaluation of Bids**

- 25.1 The Purchaser shall evaluate each Bid that has been determined, up to this stage, to be substantially responsive.
- 25.2 To evaluate a Bid, the Purchaser shall only use all the factors, methodologies and criteria defined in ITB Clause 25.3. No other criteria or methodology shall be permitted.
- 25.3 To evaluate a Bid, the Purchaser shall consider the following:
  - (a) Bids will be evaluated lot by lot. Bidder should quote for the complete requirement for goods and services specified in each lot as stipulated in ITB 8.6, failing which such Bids will be treated as non-responsive. However, if a Price Schedule shows items listed but not priced, their prices shall be assumed to be included in the prices of other items.
  - (b) An item not listed in the Price Schedule shall be assumed to be not included in the Bid, and provided that the Bid is substantially responsive, the average price of the item quoted by substantially responsive Bidders will be added to the Bid price and the equivalent total cost of the Bid so determined will be used for price comparison.
  - (c) Price adjustment due to discounts offered in accordance with ITB Clause 8.4.
  - (d) Evaluated price shall be arrived at by adding (i) price of



Goods quoted EXW including other taxes, if any, payable on the Goods (ii) price for inland transportation, insurance, and other local services required to convey the Goods to their Final Destination and (iii) price for Related Services, if any. **(GST price quoted will not be considered for evaluation of Bid)**

- 26. Comparison of Bids**      26.1 The Purchaser shall compare all substantially responsive bids evaluated in accordance with ITB Clause 25.3 to determine the lowest evaluated Bid.
- 27. Post-qualification of the Bidder**
- 27.1 The Purchaser shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive bid is qualified to perform the Contract satisfactorily.
- 27.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 11.
- 27.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid, in which event the Purchaser shall proceed to the next lowest evaluated Bid to make a similar determination of that Bidder's capabilities to perform satisfactorily.
- 28. Purchaser's Right to Accept Any Bid, and to Reject Any or All Bids**      28.1 The Purchaser reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders.

## **E. Award of Contract**

- 29. Award Criteria** 29.1 The Purchaser shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.
- 30. Purchaser's Right to Vary Quantities at Time of Award** 30.1 At the time the Contract is awarded, the Purchaser reserves the right to increase or decrease the quantity of Goods and Related Services originally specified in Section 3, Schedule of Requirements, provided the variation does not exceed 15% and without any change in the unit prices or other terms and conditions of the Bid and the Bidding Documents.
- 31. Notification of Award; Publication of Award & Recourse to unsuccessful Bidders** 31.1 Prior to the expiration of the period of bid validity, the Purchaser shall notify the successful Bidder, in writing, that its Bid has been accepted. The Purchaser shall enclose with Notification of Award, the Contract Agreement Form duly filled in for getting it signed by the selected Bidder.
- 31.2 Until the formal Contract is prepared and executed, the notification of award shall constitute a binding Contract.
- 31.3 The Purchaser shall publish on its website [wbtenders.gov.in](http://wbtenders.gov.in) the results identifying the Bid and lot numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at bid opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of Bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded. The Purchaser shall promptly respond in writing to any unsuccessful Bidder who, after Publication of contract award, requests in writing the grounds on which its bid was not selected.
- 31.4 Upon the successful Bidder's furnishing of the Performance Security in accordance with ITB Clause 33 and signing the Contract Agreement Form pursuant to ITB Clause 32, the Purchaser will promptly notify each unsuccessful Bidder.
- 32. Signing of Contract** 32.1 The successful Bidder shall sign with date, the Contract Agreement Form sent by the Purchaser pursuant to ITB 31.1, and return it to the Purchaser within 10 days of the date of receipt of the Notification of Award.

**33. Performance  
Security**

- 33.1 Within fifteen (15) days of the receipt of Notification of Award from the Purchaser, the successful Bidder shall furnish the Performance Security in the form specified in the GCC. The Purchaser shall promptly thereafter notify the name of the winning Bidder to each unsuccessful Bidder.
- 33.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security in accordance with ITB 13.5. In that event the Purchaser may award the Contract to the next lowest evaluated Bidder, whose offer is substantially responsive and is determined by the Purchaser to be qualified to perform the Contract satisfactorily.

## **Section 2 – Bidding Forms**

### **Table of Forms**

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## LETTER OF BID

*INSTRUCTIONS TO BIDDERS: PLEASE DELETE THIS BOX ONCE THE DOCUMENT HAS BEEN COMPLETED.*

*The Bidder must prepare the Letter of Bid on stationery with its letterhead clearly showing the Bidder's complete name and address.*

*Note: All italicized text is for Bidder's guidance in preparing these forms and shall be deleted from the final products.*

Invitation for Bid No.: **WBIW/NHP/IFB-03/2019-20**

Our Reference: No..... Dated.....

To:  
Executive Engineer,  
Burdwan Investigation & Planning Division,  
Purta Bhavan, 3<sup>rd</sup> Floor  
Purba Bardhaman, 713103,  
WEST BENGAL,

Subject: **Supply, Installation, Testing and Commissioning of Surface Velocity Radar and Water Level Radar for real time monitoring of river discharge including comprehensive Annual Maintenance Contract for 4 years under National Hydrology Project**

Sir,

We, the undersigned, declare that:

- (a) **No reservations:** We have examined and have no reservations to the Bidding Documents;
- (b) **Conformity:** We offer to supply in conformity with the Bidding Documents and in accordance with the Delivery Schedules specified in the Schedule of Requirements the following Goods and Related Services [*insert a brief description of the Goods and Related Services*];
- (c) **Bid Price(s):** The total price of our Bid, excluding any discounts offered in item (d) below, is:

In case of only one lot, total price of the Bid *[insert the total price of the bid in words and figures]*;

In case of multiple lots, total price of each lot *[insert the total price of each lot in words and figures]*;

In case of multiple lots, total price of all lots (sum of all lots) *[insert the total price of all lots in words and figures]*;

- (d) The discounts offered and the methodology for their application are:

**Discounts:** If our bid is accepted, the following discounts shall apply. *[Specify in detail each discount offered and the specific item of the Schedule of Requirements to which it applies.]*

**Methodology of Application of the Discounts:** The discounts shall be applied using the following method: *[Specify in detail the method that shall be used to apply the discounts];*

- (e) **Bid Validity Period:** Our bid shall be valid for the period of 90 days, from the deadline fixed for the bid submission, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) **Performance Security:** If our bid is accepted, we commit to obtain a performance security in accordance with ITB Clause 33 and GCC Clause 11 for the due performance of the Contract;
- (g) **Eligibility:** We meet the eligibility requirements and have no conflict of interest;
- (h) **One Bid Per Bidder:** We are not participating in more than one bid in this bidding process;
- (i) **Government owned entity:** We are not a government owned entity/ We are a government owned entity but meet the requirements specified in the World Bank's Guidelines referred to in ITB 3.1; *[Bidder should select the appropriate option as applicable.]*
- (j) **Ineligibility:** Our firm, its affiliates or subsidiaries—including any subcontractors or suppliers for any part of the contract - has not been declared ineligible by the Bank, or under Indian laws or official regulations;
- (i) **Binding Contract:** We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed.
- (j) **Not Bound to Accept:** We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.
- (k) **Suspension and Debarment:** We have not been debarred from participation in bidding/removed from approved list (dealings suspended) by the Central or any State Government or by the World Bank.

- (l) **Fraud and Corruption:** We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of Collusion, Fraud and Corruption.
- (m) **Prevention of Corruption Act:** We undertake that, in competing for (and, if the award is made to us, in executing) the above contract, we will strictly observe the laws against fraud and corruption in force in India namely, "Prevention of Corruption Act 1988."
- (n) **Commissions, gratuities and fees:** We have paid, or will pay the following commissions, gratuities, or fees with respect to the Bidding process or execution of the Contract: *[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity].*

| Name of Recipient | Address | Reason | Amount |
|-------------------|---------|--------|--------|
|                   |         |        |        |
|                   |         |        |        |
|                   |         |        |        |
|                   |         |        |        |

*[If none has been paid or is to be paid, indicate "none."]*

Yours faithfully,

Authorized Signature

Name & Title of Signatory \_\_\_\_\_

In the capacity of *[insert legal capacity of person signing the Letter of Bid]*

Name of Bidder \_\_\_\_\_

Address \_\_\_\_\_

Dated on \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ *[insert date of signing]*

## **Price Schedule Forms**

1. The Schedules as shown elsewhere in the documents do not generally give a full description of the goods to be supplied and the services to be performed under each item. Bidders shall be deemed to have read the Technical Specifications and other sections of the bidding documents to ascertain the full scope of the requirements included in each items prior to filling in the prices. The entered prices shall be deemed to include for the full scope as aforesaid, including overheads cost and other related services.
2. If Bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with the Instructions to Bidders in the bidding documents prior to submitting their bid.

### **Pricing**

Bidders are required to fill up the excel file uploaded with the Notice and submit it online along with the bid in the designated folder of the Financial Bid. No handwritten price offer to be submitted.

Price of items for materials or goods to be quoted should be CIF at each delivery sites and should include the price for related services at the respective project sites. Bid prices shall be quoted in the manner indicated and in the currencies specified in the Instructions to Bidders in the bidding documents. For each item, bidders shall complete each appropriate column in the respective Schedules. Prices given in the Schedules shall be for the scope covered by that item as detailed in the Technical Specifications, Drawings or elsewhere in the bidding documents. Where there are errors between the total of the amounts given under the column for the each work and the amount given under the Total Price, the former shall prevail and the latter will be corrected accordingly.

Bidders shall provide a cost break up of each item (cost analysis) for all the components/equipment to be supplied under the contract. If such are not provided during bid submission, the purchaser may at its discretion ask for the cost analysis during evaluation. Incomplete price schedule may result into non-responsive bids during evaluation.





|  |   |                 |              |  |   |  |  |                              |
|--|---|-----------------|--------------|--|---|--|--|------------------------------|
| <b>Tender Inviting Authority: Executive Engineer Burdwan Investigation &amp; Planning Division</b>   |   |                 |              |  |   |  |  |                              |
| <b>Name of Work: Supply, Installation, Testing and Commissioning of Surface Velocity Radar and Water Level Radar for real time monitoring of river discharge including comprehensive Annual Maintenance Contract for 4 years under National Hydrology Project</b>  |   |                 |              |  |   |  |  |                              |
| <b>Contract No: WBIW/NHP/IFB-03/2019-20</b>  |   |                 |              |  |   |  |  |                              |
| <b>Name of the Bidder/<br/>Bidding Firm /<br/>Company :</b>  |   |                 |              |  |   |  |  |                              |
| <b>PRICE SCHEDULE</b>  |   |                 |              |  |   |  |  |                              |
| <b>(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only )</b> |   |                 |              |  |   |  |  |                              |
| 1  | 2   | 3               | 4            | 5  | 6   | 7  | 8  | 9                            |
| <b>Sl. No.</b>   | <b>Item Description</b>   | <b>Quantity</b> | <b>Units</b> | <b>BASIC RATE In Figures per unit including freight insurance and all other charges To be entered by the Bidder in Rs. P</b> | <b>Total GST amount per line item in INR Rs P</b> | <b>TOTAL AMOUNT without GST col 7 = 3 x 5 in Rs. P</b> | <b>TOTAL AMOUNT with GST col 8 = 6 +7 in Rs. P</b> | <b>TOTAL AMOUNT In Words</b> |
| 1  | <b>Supply of Goods</b>  |                 |              |  |   |  |  |                              |
| 1.01   | Supply of Automatic River Discharge Measurement System consisting of Surface Velocity Radar type sensor, related communication hardware and accessories with all complete as per desired specification, Warranty 1 year | 2.000           | No.          | 0.00   |   |  | 0.00   | INR Zero Only                |
| 1.02   | Supply of Automatic River Discharge Measurement System consisting of Water Level Radar type sensor, related communication hardware and accessories with all complete as per desired specification, Warranty 1 year      | 2.000           | No.          |  |   |  |  |                              |
| 1.03   | Data logger, Telemetry system with power supply and related communication hardware and accessories with all complete as per desired specification, Warranty 1 year  | 2.000           | set          |  |   |  |  |                              |
| 2.00   | <b>Installation, Testing and commissioning</b>  |                 |              |  |   |  |  |                              |
| 2.01   | Installation, testing and commissioning of Automatic River Discharge Measurement System consisting of Surface Velocity Radar type sensor, related communication hardware and accessories with all complete as per       | 2.00            | No           |  |   |  |  |                              |

|                             |  |                      |     |      |  |      |      |               |
|-----------------------------|--|----------------------|-----|------|--|------|------|---------------|
|                             | desired specification, Warranty 1 year   |                      |     |      |  |      |      |               |
| 2.02                        | Installation, testing and commissioning of Automatic River Discharge Measurement System consisting of Water Level Radar type sensor , related communication hardware and accessories with all complete as per desired specification, Warranty 1 year | 2.00                 | No  |      |  |      |      |               |
| 2.03                        | Installation, testing and commissioning of Data logger, Telemetry system with power supply and related communication hardware and accessories with all complete as per desired specification, Warranty 1 year  | 2.00                 | No  |      |  |      |      |               |
| 3                           | <b>AMC Charges</b>   |                      |     |      |  |      |      |               |
| 3.01                        | AMC charges for 1st year, after 1 year warranty  | 1.000                | job | 0.00 |  |      | 0.00 | INR Zero Only |
| 3.02                        | AMC charges for 2nd year, after 1 year warranty  | 1.000                | job | 0.00 |  |      | 0.00 | INR Zero Only |
| 3.03                        | AMC charges for 3rd year, after 1 year warranty  | 1.000                | job | 0.00 |  |      | 0.00 | INR Zero Only |
| 3.04                        | AMC charges for 4th year after 1 year warranty   | 1.000                | job | 0.00 |  |      | 0.00 | INR Zero Only |
| <b>Total in Figures</b>     |  |                      |     |      |  | 0.00 | 0.00 | INR Zero Only |
| <b>Quoted Rate in Words</b> |  | <b>INR Zero Only</b> |     |      |  |      |      |               |

# Form of Bid Security

(Bank Guarantee)

*[The bank shall fill in this Bank Guarantee Form in accordance with the instructions indicated.]*

*[Guarantor letterhead or SWIFT identifier code]*

**Beneficiary:** Executive Engineer, Burdwan Investigation & Planning Division,  
Purta Bhavan, 3<sup>rd</sup> Floor Purba Bardhaman, 713103, WEST BENGAL,

**IFB No.:** *[Purchaser to insert reference number for the Invitation for Bids]*

**Alternative No.:** *[Insert identification No if this is a Bid for an alternative]*

**Date:** *[Insert date of issue]*

**BID GUARANTEE No.:** *[Insert guarantee reference number]*

**Guarantor:** *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that \_\_\_\_\_ *[insert name of the Bidder, which in the case of a joint venture shall be the name of the joint venture (whether legally constituted or prospective) or the names of all members thereof]* (hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its bid (hereinafter called "the Bid") for the execution of \_\_\_\_\_ under Invitation for Bids No. \_\_\_\_\_ ("the IFB").

Furthermore, we understand that, according to the Beneficiary's conditions, bids must be supported by a bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of \_\_\_\_\_ (\_\_\_\_\_) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

- (a) has withdrawn its Bid during the period of bid validity set forth in the Applicant's Letter of Bid ("the Bid Validity Period"), or any extension thereto provided by the Applicant; or
- (b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the performance security, in accordance with the Instructions to Bidders ("ITB") of the Beneficiary's bidding document.

This guarantee will expire: (a) if the Applicant is the successful bidder, upon our receipt of copies of the contract agreement signed by the Applicant and the performance security issued to the Beneficiary in relation to such contract agreement; or (b) if the Applicant is not the successful bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the bidding process; or (ii) forty five days after the end of the Bid Validity Period.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758.

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*[Signature(s)]*

***Note: All italicized text is for use in preparing this form and shall be deleted from the final product.***

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## **Manufacturer's Authorization**

*[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer. The Bidder shall include it in its bid in accordance with ITB Section.]*

Date: *[insert date (as day, month and year) of Bid Submission]*  
**IFB No.:** *[insert number of bidding process]*

To: Executive Engineer, Burdwan Investigation & Planning Division,  
Purta Bhavan, 3<sup>rd</sup> Floor Purba Bardhaman, 713103, WEST BENGAL,

### WHEREAS

We *[insert complete name of Manufacturer]*, who are official manufacturers of *[insert type of goods manufactured]*, having factories at *[insert full address of Manufacturer's factories]*, do hereby authorize *[insert complete name of Bidder]* to submit a bid the purpose of which is to provide the following Goods, manufactured by us *[insert name and or brief description of the Goods]*, and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 15 of the General Conditions of Contract, with respect to the Goods offered by the above firm.

Signed: *[insert signature(s) of authorized representative(s) of the Manufacturer]*

Name: *[insert complete name(s) of authorized representative(s) of the Manufacturer]*

Title: *[insert title]*

Dated on \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ *[insert date of signing]*

# PROFORMA FOR PERFORMANCE STATEMENT

*[Reference: ITB 11.2]*

Proforma for Performance Statement (for a period of last 3 years)

Bid No. \_\_\_\_\_ Date of opening \_\_\_\_\_ Time \_\_\_\_\_  
 \_\_\_\_\_ Hours

Name of the Bidder \_\_\_\_\_

| <u>Order placed by (full address of Purchaser)</u> | <u>Order No. and date</u> | <u>Description and quantity of ordered equipment</u> | <u>Value of order</u> | <u>Date of completion of delivery</u> |             | <u>Remarks indicating reasons for late delivery, if any</u> | <u>Has the equipment been satisfactorily functioning? (Attach a certificate from the Purchaser/Consignee)</u> |
|--|---------------------------|--|-----------------------|---------------------------------------|-------------|---|---|
| 1  | 2                         | 3  | 4                     | As per contract<br>5                  | Actual<br>6 | 7   | 8   |
|  |                           |  |                       |                                       |             |   |   |

---

**Signature and seal of the Bidder**

**FORM OF AFFIDAVIT FOR CORRECTNESS OF  
INFORMATION AND DOCUMENTS SUBMITTED WITH BID**

*[Reference ITB 5]*

*[This affidavit should be on a non-judicial stamp paper of Rs.10/- and shall be attested by Magistrate/ Sub-Judge/ Notary Public]*

I, ..... (*name of the authorised representative of the Bidder*) solemnly affirm and state as under:

1. I hereby certify that all the information and documents furnished with the Bid submitted online in response to IFB number ..... date ..... issued by ..... (*authority inviting bids*) for ..... (*name and identification of Goods & Related Services*) are true and correct.
  
2. \*I hereby certify that I have been authorised by ..... (*the Bidder*) to sign on their behalf, the Bid mentioned in paragraph 1 above.

Deponent

Place: .....  
Date: .....

*\* This sub-paragraph is not applicable if the Bidder is an individual and is signing the Bid on his own behalf.*



## **PART 2 - SUPPLY REQUIREMENTS**

## **SECTION 3 – SCHEDULE OF REQUIREMENTS**

|   |    |
|---|----|
| 1. LIST OF GOODS & RELATED SERVICES AND DELIVERY PERIOD ..... | 35 |
| 2. TECHNICAL SPECIFICATIONS .....                             | 37 |

### 3. LIST OF GOODS & RELATED SERVICES AND DELIVERY PERIOD

| Item No. | Description of Goods and Related Services  | Quantity | Unit | Final Destination (Project site)  | Desired Latest Delivery Period from the date of the Contract | Bidder's offered Delivery Period<br><i>[to be provided by the Bidder]</i> |
|----------|--|----------|------|---|--|---|
| 1        | 2  | 3        | 4    | 5   | 6  | 7   |
| 1.01     | Supply installation testing and commissioning of Automatic River Discharge Measurement System consisting of Surface Velocity Radar sensor, Water Level Radar type sensor, related communication hardware and accessories with all complete as per desired specification, warranty 1 year | 2        | sets | <p>1) <b>Iswar Gupta Setu over River Hooghly at Kalyani ( for 1 set )</b></p> <p>2) <b>Kolaghat Bridge over River Rupnarayan at Howrah ( for 1 set)</b></p> | Delivery installation testing and commissioning – 120 days   |   |
| 1.02     | Annual Maintenance Contract  | 1        | job  |   | 4 years after initial 1 year warranty                        |   |

1. Delivery Period offered by the Bidder should be filled in Column 7 by the Bidder.

**Date:**.....

**Signature of bidder with stamp:** .....



# TECHNICAL SPECIFICATIONS

## Introduction

Irrigation and Waterways Department (IWD), Govt. of West Bengal is entrusted with the surface water resources planning, development and management. The Ministry of Water Resources (MoWR), Government of India (GoI) has initiated 'National Hydrology Project (NHP)' ([www.indiawrm.org](http://www.indiawrm.org)) in which 'Real Time Data Acquisition System (RTDAS)' has been planned for different River basins of West Bengal as one step forward for development of 'Hydrological Information System (HIS)' for surface water resources in the State. As part of the RTDAS system automatic discharge measurement system with INSAT/GPRS/GSM Telemetry is proposed to be installed at two locations in the state for the purpose of proper Flood and Irrigation management within the State.

## General

Real Time Hydro-Met data acquisition network which will be implemented under this project provides key data required for forecasting floods and other related activities. The concept of implementation on which the present technical specifications and special conditions are based intends to combine the advantages of modern Data Loggers, data storage, processing and data communication technologies with the requirements of high availability and sustainability required by such an important project. Preference will be given to robust, reliable technology. The real-time data acquisition system networks have the greatest possible reliability, thus minimizing the maintenance to the extent possible.

## Scope of Work

- 1) Complete supply, installation, testing, commissioning of discharge measurement system at two stations including associated civil works, sensors, data logger, software, hardware and ancillaries' equipment, solar panel, mounting poles, cables, electrical and network cabling, lightning arrestors, earthing etc. complete.
- 2) Technical design, supply, installation, testing, commissioning of the real time hydrological data collection and establish data communications using **INSAT telemetry** between the hydrology observation stations and the central server of the department. 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.
- 3) Establish a GSM & GPRS receiving system along with all required data resection arrangement at State Data Centre. This shall include required communication software that will support the reception of the GSM & GPRS Data stream.
- 4) Perform on-site assembly, start-up of the supplied goods.

- 5) 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 that between ERS, modeling centers & e-SWIS software, and ensure compatible data format as per bid document and trouble-free operation of system.
- 6) Provide operation & maintenance services during One (1) year warranty period and four (4) years CAMC period to commence immediately after the expiry of warranty period to include all components at the remote stations. The CAMC must be comprehensive without any exclusion except from physical damage or force majeure will be permitted.
- 7) Provide installation and maintenance reports as required by the Purchaser and any delay is not acceptable in time schedule provided by supplier.
- 8) 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).
- 9) Onsite Calibration and validation of the installed system shall be performed on 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.
- 10) 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
- 11) All selected sites should conform to the extent practical to **WMO** guidelines. The purchaser will be responsible for obtaining permission to use property. River stage and discharge data will be logged every 1 hour and transmit data based on a schedule set in the data logger (e.g. once an hour) and/or in case of GSM/GPRS communication the data transmission on an event (e.g. a measurement reaching programmed threshold values).
- 12) The observation stations (DCPs) shall store the data for at least one year.
- 13) Bidder shall supply a detailed operation and maintenance manual for each appropriate unit of supplied goods and compile Knowledge and working supply type Manual.
- 14) 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;

### **General Features/ Specifications**

- i. It is imperative that all instrumentation, other equipment shall operate effectively with the 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 (AWLR , SVR, 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 between ERS and 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 DCPs 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 , datalogger 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 system complete, for this if any accessory or items 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 like 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 and commissioning
- 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 CAMC.
- xiv. The bidder has to validate the discharge data calculated from the observed sensor data with the actual field data obtained by ADCP or by any other methods to the satisfaction of the purchaser.
- xv. 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 CAMC** Period. Also, all the software licenses should be valid for the design life of the system, that is 10 years from date of commissioning.

## **EQUIPMENT ARRANGEMENT AT REMOTE STATIONS**

### **Automated Water Level Recorder (AWLR) for River:**

The AWLR shall be equipped with all necessary equipment's and peripherals including the following

- i. Data Collection Platform (DCP) mounted inside an enclosure which will house the following items.
  - Data Logger with INSAT, GSM & GPRS Transmission facilities with built-in display.
  - Battery for power requirements
  - Pre-wiring and configuration.
  - Solar panel-based power supply system.
  - Antenna's (INSAT, GPS, GSM / GPRS) & required accessories
- ii. Installation of suitable range of Non- contact type Water Level Radar sensor for Automatic Water Level Recorder (AWLR) with all fittings, accessories and cables and conduits.
- iii. Mast / tripod to mount DCP at the site (alternatively, where walled enclosure or tower is available, same can be mounted on the same).
- iv. Mast / tripod for solar panel & INSAT antenna. (provided locally by the Bidder)
- v. Mast can be shared with the DCP mast also
- vi. Civil works for mast (provided locally by the Bidder).
- vii. Conduit for cables GI Flexible conduits and HDPE pipe conduits.
- viii. Chain-link fencing and gate with lock if required (provided locally by the Bidder)
- ix. Power & signal cables with cable conduits.
- x. Grounding and lightning protection (provided locally by the Bidder)
- xi. All necessary software required for the system to operate properly.



## **Surface Velocity Radar (SVR) for River:**

The SVR shall be equipped with all necessary equipment's and peripherals including the following

- i. Data Collection Platform (DCP) mounted inside an enclosure which will house the following items.
  - a. Data Logger with, INSAT, GSM & GPRS Transmission facilities with built-in display.
  - b. Battery for power requirements
  - c. Pre-wiring and configuration.
  - d. Solar panel-based power supply system.
  - e. Antenna's (, GPS, GSM / GPRS) & required accessories
- ii. Surface Velocity Radar (SVR) will have Non-contact Radar type water level sensor with all fittings, accessories and cables and conduits.
- iii. Mast / tripod to mount DCP at the site (alternatively, where walled enclosure or tower is available, same can be mounted on the same).
- iv. Mast / tripod for solar panel & INSAT antenna. (provided locally by the Bidder)
- v. Mast can be shared with the DCP mast also
- vi. Civil works for mast (provided locally by the Bidder).
- vii. Conduit for cables GI Flexible conduits and HDPE pipe conduits.
- viii. Chain-link fencing and gate with lock if required (provided locally by the Bidder)
- ix. Power & signal cables with cable conduits.
  - x. Grounding and lightning protection (provided locally by the Bidder)
  - xi. All necessary software required for the system to operate properly.

## **TELEMETRY**

The data communications employed will use INSAT and GSM / GPRS radio communications. Both telemetry systems should work simultaneously for redundancy. 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.

## **INSTALLATION REQUIREMENTS**

### **SITE PREPARATION AND INSTALLATION**

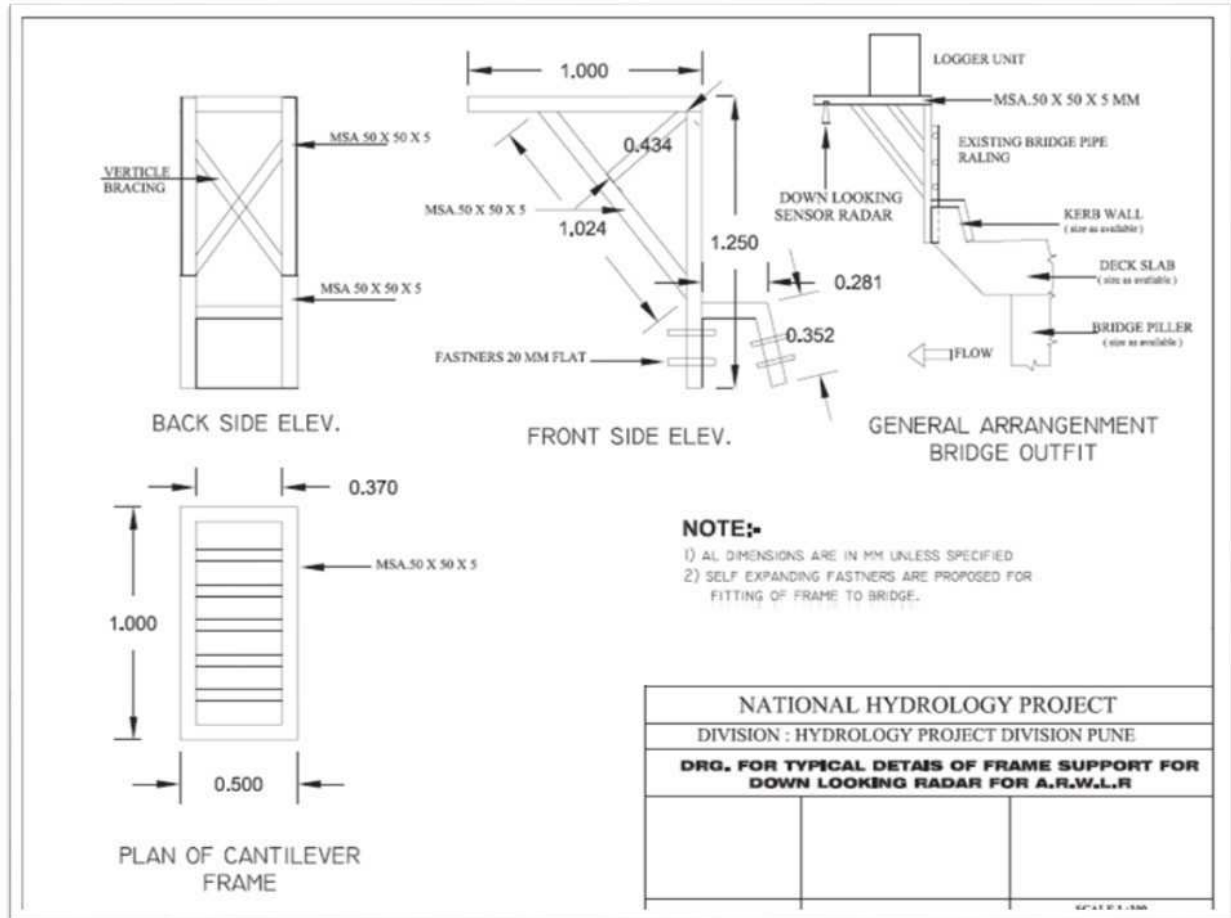
1. The purchaser will provide details of the installation sites before the scheduled installation date to allow the Bidder to perform site inspection and construction of suitable structures before the installation of the hardware.

2. The location of antenna, sensors and related civil work 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 the 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

## **5. SPECIFICATIONS FOR INSTALLATION**

### **Automatic Water Level Recorder (AWLR) and Surface Velocity Radar (SVR)**

- 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



### Mast Foundation

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

### 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 / Tripod /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. Data logger enclosure should also be grounded with local earthing.

- A pit of 1200 mm depth, 600 x 600 mm 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 150 mm of Salt + 150 mm Charcoal + 150 mm 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 with one coat of red lead oxide primer & two coats of silver paint every year to avoid rusting.
- All concrete foundations shall be painted using white cement paint every year.

The Goods and Related Services shall comply with following Technical Specifications and Standards:

#### i. RADAR TYPE WATER LEVEL SENSOR (35M)

| Feature                 | Value   |
|-------------------------|---|
| <b>Site Conditions</b>  |   |
| Ambient Temperature     | From -5 to +60 °C   |
| Humidity                | 0 to 100 %  |
| Altitude                | 0 to 2500 meter   |
| <b>Sensor</b>           |   |
| Sensor Type             | Microwave non-contact sensor  |
| Range                   | 35 meter  |
| 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.  |
| Beam angle              | Less than 16 degree.  |
| <b>General Features</b> |   |
| Housing Material        | Corrosion Resistance (Stainless steel / die cast Aluminum or PVC/UV stabilized ABS with metal casing) |
| Enclosure               | The Sensor shall be easy to dismount and replace in the event of malfunction.                         |

| Feature  | Value  |
|--|--|
| 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   | NEMA 4 or IP67 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 |  |

### **Surface Velocity Radar**

**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          | 25 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 Aluminium/ 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   | NEMA 4 or 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 |   |

#### Data logger with 2 AI channels

| Feature                          | Value  |
|----------------------------------|--|
| <b>Site Conditions</b>           |  |
| Ambient Temperature              | From -5to +60 Degree C   |
| Humidity                         | 5 to 100 %   |
| Altitude                         | 0 to 2500meter   |
| <b>Sensor Interface</b>          |  |
| Analogue Inputs                  | 2-Analogue Input Channels<br>4 to 20 mA, 100% over range withstand<br>(Analog input channels are required in datalogger, if any sensor offered by bidder requires Analog interface to integration with datalogger) |
| SDI Port                         | One SDI-12 Interface port  |
| Serial Port for sensor interface | One RS-232 / RS-485 for sensor Interface port  |
| 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/USB) for communication with Laptop for programming   |
| Port for Telemetry                 | 2 Ports for Communication with Telemetry (GSM,GPRS and INSAT) device Both telemetry systems should work simultaneously for redundancy. |
| 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 store one year of data. & expandable upto 1GB 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 4 or 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>GSM / GPRS MODEM</b>        |  |
| <b>Ambient Site Conditions</b> |  |
| Operating Temperature          | From -5 to +60°C   |
| Performance                    | Data Reception availability of 95% or better   |
| Form factor                    | The GSM /GPRS modem should either be integral part of data logger specified above, or it should be supplied as independent unit compatible with supplied data logger |
| <b>Specific Features</b>       |  |
| Communication Direction        | Utilize GPRS network for two-way connection with FTP, TCP/IP (INTERNET) connection and SMS   |
| Transmission trigger           | Data collection to be triggered by interrogation from Data Center, or by event-based transmission triggered by remote site   |
| Power Saving                   | Ability to disable interrogation system in order to save power at remote site  |
| Communication Protocol         | Data transmission to execute HTTP Post, FTP, SMS to transmit and receiving data to the Data Center   |
| Accessories                    | All associated equipment, including Antenna all cables and mounting hardware   |
| <b>Antenna features</b>        |  |
| Frequency range                | 900 MHz: 824-960 MHz/1800MHz:1710-1880 MHz, 4G and better  |
| Impedance                      | 50 ohms  |
| VSWR                           | ≤ 2.0  |
| Radiation                      | Omni-directional   |
| Operating temperature          | -5 to + 60 degrees Celsius   |
| Connector                      | SMA or suitable RF connector adaptable to GSM/GPRS modem   |
| Cable length                   | As required at site  |



## INSAT Radio

**FUNCTIONAL REQUIREMENT:** To transmit data

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

| Feature                       | Value   |
|-------------------------------|---|
| Operating Temperature         | From -5to +60 <sup>0</sup> C  |
| Environment Relative Humidity | 0 to 100 %  |
| Career Frequency              | 402 – 403 MHz   |
| Carrier Settability           | In steps of 100Hz from 402.0 MHz to 403.0 MHz   |
| Modulator                     | PCM/BPSK  |
| Data coding                   | NRZ (L)   |
| Output Power                  | 3-10Watt, user settable   |
| Data Bit Rate                 | 4.8 kbps  |
| Frequency Stability           |   |
| a. Long Term                  | Transmit frequency inaccuracy including aging of oscillator should not exceed $\pm 400$ Hz per year. Oscillators/synthesizer should have provision to adjust for the long-term drift. |
| b. for temperature            | $\pm 1$ ppm or better (-40 to +55 degrees Celsius)  |
| Signal Bandwidth              | 6.0 KHz maximum or better   |
| Power Stability               | $\pm 1$ dB  |
| Spurious                      | -60dB or better   |
| Harmonics                     | -40dB or better   |
| Antenna cable                 | LMR 400 grade or better   |
| Performance                   | Data Reception availability of 99% or better  |
| Form factor                   | The Transmitter should either be integral part of data logger specified above, or it should be supplied as independent unit compatible with supplied data logger                      |
| Operating Power               | Switched 12V DC controlled by data logger   |
| <b>Yagi Antenna</b>           |   |
| Polarization                  | LHCP or RHCP, switchable in field   |
| Gain                          | Minimum 11 dbi or better  |
| Center Frequency              | 402-403 MHz   |
| Mounting                      | Proper mounting and Pointing arrangement for 360-degree azimuth and elevation adjustment  |
| Operating Wind speed          | 250 kmph  |
| Wind Survival                 | 300 kmph  |
| Material                      | Rust-proof and Oxidation-proof  |
| <b>Specific Features</b>      |   |
| Satellite System              | INSAT Radio System to be Used on the INSAT Satellite operated by ISRO   |
| Certification                 | Certificate of acceptance required by ISRO or IMD as part of the bid package  |

|             |   |
|-------------|---|
| Accessories | All associated equipment, including GPS, GPS Antenna, INSAT Antenna, all cables and mounting hardware |
|-------------|---|

## Data Collection Platform

1. The system shall automatically collect the observations from attached sensors, process and store them into its memory and transmit through GSM /GPRS communication link to central station as per the preprogrammed measurement interval, and also system shall transmit hourly basis data of every full hour IST to the ERS through satellite at preprogrammed 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 /RS232 / RS485 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 and Transmission.
  - Sensor identification
  - Data transmission time for INSAT & GSM/ GPRS communication
  - Programmable Sensor data measurement interval
  - Configuration of Measurement, logging & GPRS/GSM data transmission interval
  - Gain, offset, Datum parameterization for all sensors
  - Configuration of FTP server & mobile number of data center.
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 is 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. The

- downloaded data shall be provided in the prescribed format provided for GSM/GPRS in technical specifications
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 provide a complete health status of the battery, transmitter and other components
  15. 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 sub menus. 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 GPRS shall available in data logger
  16. The DCP shall be housed in a weather proof and temper proof housing.
  17. DCP Should be supplied with Software for configuration and troubleshooting
  18. The data logger shall be programmable locally in field via laptop / PC.
  19. 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.
  20. 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.

21. The data logger shall store data in memory, in case of GPRS/GSM communication failure. The data shall be transferred automatically once GPRS/GSM communication is retained. This will ensure no data loss during no communication also.

## **Transmitter & Antenna**

The INSAT transmitter should be an internal or external component of DCU. It should have necessary hardware and software to receive data from the data logger and transmit in TDMA mode. The transmitter should have the capability to handle data transmission to the DRTs located on any of the INSAT series of satellites. The selection of frequency and mode of transmission shall be through software settings only. No hardware changes for switching from one satellite DRT to another are acceptable.

## **Lightning Protection**

The entire unit has to be adequately protected against lightning and build of static charges. The lightning rod should protrude 1 m above the highest point (Antenna) and should be placed in the center of the pole. The mast should be electrically grounded by following as per CPWD earthing procedures. As a part of the maintenance, the lightning equipment shall be inspected on a yearly basis for its conductivity and effectiveness. Such inspection shall be carried out in the pre-monsoon period and any faults noticed shall be rectified.

## **Earthing For Equipment**

The electrical grounding for all other electronic and electrical equipment should be done by following standard CPWD procedure. The earthing for the equipment's should be done separately and should have a minimum distance of 2.5 meter from the earthing done for lightning rod. In no case both the earths should be done in the same earthing rod.

As a part of the maintenance, the earthing equipment shall be inspected on a yearly basis for its conductivity and effectiveness. Such inspection shall be carried out in the pre-monsoon period and any faults noticed shall be rectified.

## **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 at site. 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 15days 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 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 Supply 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 / as compatible with DCP and all sensors  |
| Type   | Sealed maintenance free   |
| Capacity   | 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   |
| <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   |
| Mounts   | The mounts should be sturdy in design and 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 15 days in absence of charging. |   |

## SPECIFICATION FOR CABLING AND CONDUITS

- i. The term cable shall always include necessary type of connectors at both the ends for connecting between two equipment. The connectors shall be properly anchored with protective sheathing of the cable in such a way that the loads due to pulling and twisting shall be borne by the protective sheathing and the conductors shall not be subjected to any stress.
- ii. The connectors shall be so fixed on the individual components of the system that the metal/plastic connector shall always transfer the loads due to pulling and twisting directly to the protective body of the component and the internal interface cards/connections shall not be subjected to any load.
- iii. Laying of necessary data and power supply cables for connecting various components and embedding them or protecting them with necessary conduits shall be carried out as per directions of engineer-in-charge.
- iv. Wherever the cables are to be laid indoors and the length of the individual cable run exceeds 1 meter, the cable shall be housed in a protective conduit made of electrical supply grade conduit of appropriate diameter and the conduit shall be fixed with the wall at a height not less than 1 meter above the floor surface. Whenever the indoor cable is required to cross the floor, it shall be housed in a HDPE pipe of 25 mm

internal diameter and the pipe shall be fixed to the floor with suitable protective covering to avoid tripping of personnel using the area or disturbance to the pipe due to such movement.

- v. Wherever cables are to run through open ground including the public road and pathways, the cable shall be armored/ shielded and shall be water ingress proof up to static water pressure of 5 kg/cm<sup>2</sup>. All joints made in cable shall also meet the water proofing criteria. In addition, the cable shall be protected by housing the same in 25 mm HDPE pipe/flexible metallic conduit embedded at a depth of not less than 1.0 meter below the ground surface with a warning brick on the same. A sketch of the cable layout with respect to the identifiable marks of the area shall be prepared and handed over to the Engineer-in-charge for each such cable run on completion of the work of cable laying operation.
- vi. The joints in the cable connecting between the sensor and data collection unit shall be avoided by measuring the appropriate length of the cable required and attaching the same in one piece. If the cable joints become necessary, prior permission of the Engineer-in-charge shall be obtained before executing the same. The joint fabricated through a splicing and jointing kit shall be stronger than the parent cable.
- vii. The cable carrying data and electrical AC power shall be housed separately in different conduits separated by adequate distance to prevent leakage currents. The data cables shall also be laid out in such a way that the data integrity is not compromised due to mutual interference.
- viii. Shielded (screened) cables shall be used for external Cabling, the power and control cables shall be generally as per IS 8130/34. For these cables, equivalent IEC/IS specifications are also acceptable
  - All cables shall have stranded copper conductor of suitable cross section depending on load.
  - The Communication cable/power cable shall be of shielded, twisted pair type.These are minimum requirements. Bidder is free to propose improved cabling technology

### **Preventive Maintenance**

The bidder shall be responsible for operation and maintenance of all stations /components of installations, commissioning, site acceptance and operation tests. All equipment maintenance cost, repairs, replacements and repairs to civil work shall be borne by the bidder during the warranty and CAMC Period. The scope of O&M support would include all materials and services including replacement of components including batteries, mandatory spare parts required to ensure smooth and sustainable operations of the entire system. The bidder shall provide monthly maintenance reports during the course of

maintenance. The bidder shall supply a Manual specifying all the faults experienced by the system together with an account of how such faults have been rectified.

The bidders shall ensure the following minimum visits at remote site for preventive maintenance. The bidder should take time stamped geo tagged photographs of the equipment during each maintenance visit (either scheduled or unscheduled visit). The photographs should show the condition of equipment before maintenance, during maintenance and after maintenance.

## **System functionalities**

### **Data Acquisition**

- i. The Automatic Discharge system must support various data acquisition modes including at least:
  - Scheduled acquisition
  - On-demand acquisition
  - Alarm based acquisition
- ii. The data acquisition rate shall be individually configurable for each sensor. The rate shall be adjustable from 1 minute to 24 hours in steps of 1 minute.
- iii. Data messages shall be sent automatically by the system at the user set intervals. There shall be possibility to configure several data messages to serve different purposes and/or users.
- iv. It shall be possible to trigger any measurement on-demand basis, i.e. whenever the user wants to have the instantaneous real time data to be made available.
- v. Regardless of when the data logger samples, the user shall be able to set a threshold(s) for any measured or calculated parameter to detect whether a threshold has been exceeded. Once a threshold has been crossed the system shall immediately transmit the data without waiting for scheduled transmission time and automatically start using a new user set sampling interval until the value returns below the threshold level.

### **Data Transmission**

- i. The equipment shall support various kinds of communication modules for GSM/GPRS, and satellite.
- ii. To increase the reliability and redundancy, the Automatic Discharge system shall have capacity to interface with minimum of two different telemetry devices at the same time.

### **Data Logging**

- i. The system must be able to log measured and calculated data into a non-volatile flash memory.
- ii. The logging interval for each variable must be freely configurable.



- iii. In case the memory should run out of free space, the system must automatically clear more free memory by deleting the oldest data first, so that the most recent data will always be saved.
- iv. The file system on the memory card must be readable with any PC.

### **Data Quality Control**

- i. The system must be able to check the measurement data quality to ensure accurate and complete data collection. It must be possible to automatically flag incorrect or missing data with a user-configurable symbol or text.
- ii. The system must be possible to automatically perform at least the following quality checks for every measurement:
  - a) For each measured parameter there shall be upper and lower hydrological limits that corresponds to the normal operating limits of the sensor in order to prevent the reporting of possibly false values. These parameters must be user configurable to adjust them to the local hydrological conditions.
  - b) For each parameter there shall be a 'step change' validation. If the sensor output value changes more that the set maximum value between two consecutive measurements, the value shall be set 'invalid' (e.g. erroneous). This parameter must be user configurable to adjust it to the local climatologically/ Hydrological conditions.
  - c) For each statistical calculation, there shall be the user configurable parameter for minimum number of the samples available for computing statistical values. If the number of samples is less than the user set value, the value shall be set 'invalid' (e.g. erroneous).
  - d) The system must be able to indicate the status of the connected sensors. This indication shall include both analog sensors as well as sensor with digital serial interface. For each sensors, there shall be value in the variable status, which can be included in the report(s) and/or monitored in order to produce an alarm e.g. for maintenance purposes.

### **Calculations**

- i. Statistical calculations: The station must be able to perform statistical calculations for any of the variables. The period over which the calculations are made must be adjustable from 1 second to 24 hours. At least the following operations must be supported:
  - Average
  - Minimum
  - Maximum
  - Standard deviation
  - Cumulative sum
  - Arithmetic operations

## **ALARM Function**

In order to enable early warnings for severe water level, discharge or system malfunction, the station must support the alarm functions described here.

- I. The system shall be possible for the user to freely set threshold limits for any of the measured or calculated parameters. It must be possible to configure an alarm to be launched whenever a parameter:
  - exceeds a set upper limit (e.g. when the precipitation intensity exceeds 30mm/h),
  - goes below a set lower limit (e.g. water level goes below 2.4 m),
  - is between a set range (e.g. Rate of Change of water level is between 1cm to 50cm),
  - is out of a user set reference range.
  - Changes faster than a user set rate, selectable both descending and/ or ascending value.
  - Once a threshold has been crossed the system shall immediately transmit the data without waiting for scheduled transmission time.
  
- II. The possible actions to be taken automatically when an alarm is launched shall include:
  - sending a message to the user configured destination
  - storing the alarm event together with the measured value
  - triggering the logging of user defined data group
  - Triggering an external signal e.g. a relay contact, light switch etc.
  
- III. The user shall be able to configure the alarm action to be taken:
  - only once on the first occasion an alarm is detected,
  - always when the alarm condition stays effective
  - when the alarm condition disappears, i.e. the parameter return to its normal value
  - define what the system should do upon detection of ALARM

## **System Clock**

- i. The station must have a Real Time Clock (RTC) protected against power losses.
- ii. The system must be able to operate in UTC or local time.
- iii. Daylight saving time must be enabled to be adjusted automatically.
- iv. For supporting real-time messaging and alarm generation, the internal real-time clock's accuracy must be better than twenty (20) seconds per month.
- v. In addition, it must be possible to adjust RTC using at least the following methods:
  - locally via terminal commands
  - remote commands over a network
  - automatically from a central data collections system or an NTP server

- using a GPS (Global Positioning System) signal if such a receiver is connected to the system

### **Power Saving Mode**

- i. When there is insufficient power at a remote station, the system shall enter into low power mode. When in low power mode, the system shall switch off the communication module (PSTM modem, satellite transmitter etc) for most of the time, and will switch it on at user defined time(s) for narrow time window. Example: Communication module is switched off. It is switched on for 5 minutes at the beginning of the full hour.
- ii. After the user set period in low power mode, the system shall be capable to switch off the communication device to save the battery. The system shall continue to work as data logging station only
- iii. Alarm notification shall be provided regardless of power saving mode i.e Once a threshold has been crossed the system shall immediately transmit the data without waiting for scheduled transmission time.

### **Other requirements**

#### Discharge monitoring site

The Automatic River Discharge Measurement System shall be installed in the sites given above. It is to be ensured that I&WD officials are present at the site during the installation commissioning of the site. Each site should have a good quality metal sign board (size: Height 60cm x width 100cm) in English with information details which will be provided during time of installation.

## TECHNICAL RESPONSIVENESS FORM

**Bidder shall furnish clause by clause commentary against the laid down technical specification and standards as per the format given below:**

### 1) Specifications of the RADAR water Level Transmitter

| Name of Goods- Its Features | Required Specifications and standards as per bidding document                              | Specification and standard as offered in by Bidder                                      | Remarks |
|-----------------------------|--|---|---------|
| <b>RADAR Level Sensor</b>   |  | <b>Make:</b><br><b>Model:</b><br>Manufacturer Name, address, email, phone, website, fax |         |
| <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                       | 0-35meters   |   |         |
| 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.   |   |         |
| Beam angle                  | Less than 16 degrees.  |   |         |
| <b>General Features</b>     |  |   |         |
| Material                    | Corrosion Resistance (Stainless steel / 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                                    | IP67 or NEMA 4 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 |  |  |
| Special Feature                               | Radar Sensor should have inbuilt diagnostic & averaging feature  |  |  |

## 2) Specifications of the SVR

| Name of Goods-Its Features | Required Specifications and standards as per bidding document | Specification and standard as offered in by Bidder                                      | Remarks |
|----------------------------|---|---|---------|
| <b>SVR</b>                 |   | <b>Make:</b><br><b>Model:</b><br>Manufacturer Name, address, email, phone, website, fax |         |
| <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          | 0-25meters  |   |         |
| Velocity measurement Range | Up to 15 m/s (Configurable)                                   |   |         |
| 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 /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                                    | NEMA 4 or 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 |  |  |
| Special Feature                               | Sensor shall have facility of bidirectional flow measurement  |  |  |

### 3) Specifications of Data Logger with 2 AI Channel

| <b>Name of Goods-Its Features</b>   | <b>Required Specifications and standards as per bidding document</b>                         | <b>Specification and standard as offered in by Bidder</b>                               | <b>Remarks</b> |
|-------------------------------------|--|---|----------------|
| <b>Data Logger with 2AI sensors</b> |  | <b>Make:</b><br><b>Model:</b><br>Manufacturer Name, address, email, phone, website, fax |                |
| <b>Site Conditions</b>              |  |   |                |
| Ambient Temperature                 | From -5to +60 Degree C   |   |                |
| Humidity                            | 5 to 100 %   |   |                |
| Altitude                            | 0 to 2500meter   |   |                |
| <b>Sensor Interface</b>             |  |   |                |
| Analogue Inputs                     | 2-Analogue Input Channels<br>4 to 20 mA, 100% over range withstand<br>(Analog input channels |   |                |

|                                    |   |  |  |
|------------------------------------|---|--|--|
|                                    | are required in datalogger,if any sensor offered by bidder requires Analog interface to integration with datalogger)                  |  |  |
| SDI Port                           | One SDI-12 Interface port   |  |  |
| Serial Port for sensor interface   | One RS-232 / RS-485 for sensor Interface port   |  |  |
| 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/USB ) for communication with Laptop for programming   |  |  |
| Port for Telemetry                 | 2 Ports for Communication with Telemetry (GSM,GPRS and INSAT) device Both telemetry systems should work simultaneously for redundancy |  |  |
| 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                | ± 1 LSB   |  |  |
| Sample intervals                   | 1 Sec to 24 hours (user scalable)   |  |  |
| <b>General Features</b>            |   |  |  |
| Flash memory                       | Non-volatile Flash memory that can store one year of data and expandable upto minimum of 1 GB via. USB/SD card                        |  |  |
| Resolution                         | A/D resolution ≥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 $\leq 10.0\text{mA}$ ) |   |  |
| 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 is required in IST format   |   |  |
| System integrity             | System integrity check procedures   |   |  |
| Enclosure                    | for wall-mounting in a shelter / enclosure with IP65 (NEMA 4 or 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><u>GSM/GPRS MODEM</u></b> |   | <b>Make:</b><br><b>Model:</b><br>Manufacturer Name, address, email, phone, website, fax |  |
| Operating Temperature        | From -5 to +60 °C   |   |  |



|                          |  |  |  |
|--------------------------|--|--|--|
| Transmission System      | GPRS/edge-based data transmission system   |  |  |
| Performance              | Data Reception availability of 95% or better   |  |  |
| Form factor              | The GSM /GPRS modem should either be integral part of data logger specified above, or it should be supplied as independent unit compatible with supplied data logger |  |  |
| <b>Specific Features</b> |  |  |  |
| Communication Direction  | Utilize GPRS network for two-way connection with FTP, TCP/IP (INTERNET) connection and SMS   |  |  |
| Transmission trigger     | Data collection to be triggered by interrogation from Data Center, or by event-based transmission triggered by remote site   |  |  |
| Power Saving             | Ability to disable interrogation system in order to save power at remote site  |  |  |
| Communication Protocol   | Data transmission to execute HTTP Post, FTP, SMS to transmit and receiving data to the Data Center   |  |  |
| Accessories              | All associated equipment, including Antenna all cables and mounting hardware   |  |  |
| <b>Antenna features</b>  |  |  |  |
| Frequency range          | 900 MHz: 824-960 MHz/1800MHz:1710-1880 MHz, 4G and better  |  |  |
| Impedance                | 50 ohms  |  |  |
| VSWR                     | ≤ 2.0  |  |  |
| Radiation                | Omni-directional   |  |  |
| Operating temperature    | -5 to +60 degrees Celsius  |  |  |
| Connector                | SMA or suitable RF connector adaptable to GSM/GPRS modem   |  |  |
| Cable length             | As required at site  |  |  |

#### 4) Specifications of INSAT Radio

| Name of Goods-Its Features     | Required Specifications and standards as per bidding document   | Specification and standard as offered in by Bidder                                      | Remarks |
|--------------------------------|---|---|---------|
| <b>INSAT Transmitter Radio</b> |   | <b>Make:</b><br><b>Model:</b><br>Manufacturer Name, address, email, phone, website, fax |         |
| Operating Temperature          | From -5to +60 <sup>0</sup> C  |   |         |
| Environment Relative Humidity  | 0 to 100 %  |   |         |
| Career Frequency               | 402 – 403 MHz   |   |         |
| Carrier Settability            | In steps of 100Hz from 402.0 MHz to 403.0 MHz   |   |         |
| Modulator                      | PCM/BPSK  |   |         |
| Data coding                    | NRZ (L)   |   |         |
| Output Power                   | 3-10Watt, user settable   |   |         |
| Data Bit Rate                  | 4.8 kbps  |   |         |
| Frequency Stability            |   |   |         |
| a) Long Term drift             | Transmit frequency inaccuracy including aging of oscillator should not exceed $\pm 400$ Hz per year. Oscillators/synthesizer should have provision to adjust for the long-term drift. |   |         |
| for temperature                | $\pm 1$ ppm or better (-40 to +55 degree Celsius)   |   |         |
| Signal Bandwidth               | 6.0 KHz maximum or better   |   |         |
| Power Stability                | $\pm 1$ dB  |   |         |
| Spurious                       | -60dB or better   |   |         |
| Harmonics                      | -40dB or better   |   |         |
| Antenna cable                  | LMR 400 grade or better   |   |         |
| Performance                    | Data Reception availability of 99% or better  |   |         |
| Form factor                    | The Transmitter should either be integral part of data logger specified above, or it should be supplied as  |   |         |

|                             |   |   |  |
|-----------------------------|---|---|--|
|                             | independent unit compatible with supplied data logger   |   |  |
| Operating Power             | Switched 12V DC controlled by data logger   |   |  |
| <b>Yagi Antenna</b>         |   | <b>Make:</b><br><b>Model:</b><br>Manufacturer Name, address, email, phone, website, fax |  |
| Polarization                | LHCP or RHCP, switchable in field   |   |  |
| Gain                        | Minimum 11 dBi or better  |   |  |
| Center Frequency            | 402-403 MHz   |   |  |
| 3dB Beam width              | 40°   |   |  |
| VSWR                        | 1.2 : 1   |   |  |
| Impedance                   | 50 ohms   |   |  |
| Axial Ratio                 | To be specified by tenderer   |   |  |
| Operating temperature       | -5°C to +60°C   |   |  |
| Operating Relative Humidity | 0 to 100% RH  |   |  |
| Size                        | Small, portable   |   |  |
| Operating rain rate         | 100 mm/hr and water proof   |   |  |
| Mounting                    | Proper mounting and Pointing arrangement for 360-degree azimuth and elevation adjustment              |   |  |
| Operating Wind speed        | 250 kmph  |   |  |
| Wind Survival               | 300 kmph  |   |  |
| Material                    | Rust-proof and Oxidation-proof  |   |  |
| <b>Specific Features</b>    |   |   |  |
| Satellite System            | INSAT Radio System to be Used on the INSAT Satellite operated by ISRO                                 |   |  |
| Certification               | Certificate of acceptance required by ISRO and / or IMD as part of the bid package                    |   |  |
| Accessories                 | All associated equipment, including GPS, GPS Antenna, INSAT Antenna, all cables and mounting hardware |   |  |

|                                |   |  |  |
|--------------------------------|---|--|--|
| TDMA Transmission Format       | As specified in the table for channel specifications for TDMA transmission format |  |  |
| GPRS / GSM transmission format | As specified in the table for GSM /GPRS communication format                      |  |  |

### 5) Specifications of Solar Power Supply System

| Name of Goods-Its Features | Required Specifications and standards as per bidding document  | Specification and standard as offered in by Bidder                                      | Remarks |
|----------------------------|--|---|---------|
| <b>Battery</b>             |  | <b>Make:</b><br><b>Model:</b><br>Manufacturer Name, address, email, phone, website, fax |         |
| Voltage                    | From 0 to +60 V / as compatible with DCP and all sensors   |   |         |
| Type                       | Sealed maintenance free  |   |         |
| Capacity                   | 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                          |   |         |
| <b>Solar Panel</b>         |  | <b>Make:</b><br><b>Model:</b><br>Manufacturer Name, address, email, phone, website, fax |         |
| 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                          |   |         |
| Mounts                     | The mounts should sturdy in design and 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 |  |  |

## **PART 3 – CONTRACT**

### **Section 4 - General Conditions of Contract**

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## Section 4 - General Conditions of Contract

### 1. Definitions

The following words and expressions shall have the meanings hereby assigned to them:

- (a) “Bank” means the World Bank and refers to the International Bank for Reconstruction and Development (IBRD) or the International Development Association (IDA).
- (b) “Contract” means the Contract Agreement entered into between the Purchaser and the Supplier, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein.
- (c) “Contract Documents” means the documents listed in the Contract Agreement, including any amendments thereto.
- (d) “Contract Price” means the price payable to the Supplier as specified in the Contract Agreement, subject to such additions and adjustments thereto or deductions there from, as may be made pursuant to the Contract.
- (e) “Day” means calendar day.
- (f) “Completion” means the fulfillment of the Related Services by the Supplier in accordance with the terms and conditions set forth in the Contract.
- (g) “GCC” mean the General Conditions of Contract.
- (h) “Goods” means all of the commodities, raw material, machinery and equipment, and/or other materials that the Supplier is required to supply to the Purchaser under the Contract.
- (i) “Purchaser’s Country” is India.
- (j) “Purchaser” means the entity purchasing the Goods and Related Services, as specified in the Contract Agreement.
- (k) “Related Services” means the services incidental to the supply of the goods, such as insurance, installation, start-up, training and initial maintenance and other such obligations of the Supplier under the Contract.

- (l) “Subcontractor” means any natural person, private or government entity, or a combination of the above, to whom any part of the Goods to be supplied or execution of any part of the Related Services is subcontracted by the Supplier.
  - (m) “Supplier” means the natural person, private or government entity, or a combination of the above, whose bid to perform the Contract has been accepted by the Purchaser and is named as such in the Contract Agreement.
  - (n) “The Project Site,” where applicable, means the place named in the Contract Agreement
- 2. Fraud and Corruption**
- 2.1 If the Purchaser determines that the Supplier has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, as defined in the Bank’s Procurement Guidelines, in competing for or in executing the Contract, then the Purchaser may, after giving 14 days’ notice to the Supplier, terminate the Supplier’s employment under the Contract and cancel the contract without prejudice to the other sanctions established in law.
- 3. Governing Law**
- 3.1 The Contract shall be governed by and interpreted in accordance with the laws of the Union of India.
- 4. Settlement of Disputes**
- 4.1 The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.
- 4.2 If, after twenty-eight (28) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration by a sole arbitrator not below the level of retired Chief Engineer /Superintending Engineer (not connected in part or whole with this project in his service) to be appointed by Purchaser. Arbitration may be commenced prior to or after delivery of the Goods under the Contract. Arbitration proceedings shall be conducted in accordance with the rules of procedure specified in Arbitration and Conciliation Act 1996.
- 4.3 Notwithstanding any reference to arbitration herein, the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and the Purchaser shall pay the Supplier any monies due the Supplier.



- 5. Scope of Supply** 5.1 The Goods and Related Services to be supplied shall be as specified in the Contract Agreement.
- 6. Delivery** 6.1 The Delivery of the Goods and Completion of the Related Services shall be in accordance with the Delivery and Completion Schedule specified in the Schedule of Requirements.
- 7. Supplier's Responsibilities** 7.1 The Supplier shall supply all the Goods and Related Services included in the Scope of Supply in accordance with GCC Clause 5, and the Delivery and Completion Schedule, as per GCC Clause 6.
- 8. Contract Price** 8.1 Prices charged by the Supplier for the Goods supplied and the Related Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid.
- 9. Terms of Payment** 9.1 The Contract Price as specified in the Contract Agreement shall be paid as under.
- (a) On Delivery: eighty (80) % of the contract price excluding AMC charge shall be paid on receipt installation testing and commissioning of the Goods at designated site and upon submission of the documents specified in GCC Clause 9.2; and
- (b) On Final Acceptance: Balance twenty (20) % of the Contract Price shall be paid within thirty (30) days after the date of the Final Acceptance Certificate issued by the Director, River Research Institute.
- 9.2 The Supplier's request for payment shall be made to the Purchaser in writing, accompanied by invoices describing, as appropriate, the Goods delivered and Related Services performed, and by the and by the dispatch documents, packing list, Manufacturer's/Supplier's warranty certificate, and upon fulfillment of all other obligations stipulated in the Contract.
- 9.3 Payments shall be made promptly by the Purchaser, but in no case later than thirty (30) days after submission of an invoice or request for payment by the Supplier, and after the Purchaser has accepted it.
- 9.4 The payments shall be made in Indian Rupees to the Supplier under this Contract.
- 10. Taxes and Duties** 10.1 The Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Goods to the Purchaser.

**11. Performance Security**

- 11.1 The Supplier shall, within fifteen (15) days of the notification of contract award, provide a performance security for the performance of the Contract for an amount of **10%** of the contract value, valid up to 45 days after the date of completion of performance obligations including warranty obligations.
- 11.2 The Performance Security shall in the form of a Bank Guarantee or a cashier's cheque or banker's certified cheque or crossed demand draft or pay order drawn in favour of the Purchaser, which shall be issued by any Nationalized/Scheduled bank in India.
- 11.3 The Performance Security shall be discharged by the Purchaser and returned to the Supplier not later than twenty-eight (28) days following the date of Completion of the Supplier's performance obligations under the Contract, including any warranty obligations.
- 11.4 The Supplier shall, within ten (10) days of the completion of the warranty period, provide a fresh performance security for the performance of the AMC for an amount of 20 % of the total AMC value, valid up to 45 days after the date of completion of performance obligations including AMC obligations.

**12. Specifications and Standards**

- 12.1 Technical Specifications and Drawings
  - (a) The Goods and Related Services supplied under this Contract shall conform to the technical specifications and standards mentioned in Section 3, Schedule of Requirements and, when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is appropriate to the Goods' country of origin.

**13. Inspections and Tests**

- 13.1 The inspections and tests shall be conducted by the Purchaser at the Goods' final destination.
- 13.2 The Purchaser may reject any Goods or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Supplier shall either rectify or replace such rejected Goods or parts thereof or make alterations necessary to meet the specifications at no cost to the Purchaser.

**14. Liquidated Damages**

- 14.1 If the Supplier fails to deliver any or all of the Goods by the Date(s) of delivery or perform the Related Services within the period specified in the Contract, the Purchaser may deduct from the Contract Price, as liquidated damages, a sum equivalent to 0.5% of the price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum

deduction of 10% of the Contract value.

## **15. Warranty**

- 15.1 The Supplier warrants that the Goods shall be free from defects arising from any act or omission of the Supplier or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination.
- 15.2 The warranty shall remain valid for one year after the Goods, or any portion thereof as the case may be, have been delivered, installed, commissioned and accepted at the final destination / Project site indicated in the Contract Agreement.
- 15.3 Upon receipt of Purchaser's notice, the Supplier shall, within 10 days, expeditiously repair or replace the defective Goods or parts thereof, at no cost to the Purchaser.

## **16. Extensions of Time**

- 16.1 If at any time during performance of the Contract, the Supplier or its subcontractors should encounter conditions impeding timely delivery of the Goods or completion of Related Services, the Supplier shall promptly notify the Purchaser in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, in which case the extension shall be ratified by the parties by amendment of the Contract.
- 16.2 Any delay by the Supplier in the performance of its Delivery and Completion obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 14, unless an extension of time is agreed upon, pursuant to GCC Sub-Clause 16.1.

## **17. Termination**

- 17.1 Termination for Default
- (a) The Purchaser, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate the Contract in whole or in part:
- (i) if the Supplier fails to deliver any or all of the Goods within the period specified in the Contract, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 16;
- (ii) if the Supplier fails to perform any other obligation under the Contract; or
- (iii) if the Supplier, in the judgment of the Purchaser has engaged in fraud and corruption, as defined in GCC Clause 3, in competing for or in executing the Contract.

- (b) In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 17.1(a), the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or Related Services similar to those undelivered or not performed, and the Supplier shall be liable to the Purchaser for any additional costs for such similar Goods or Related Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

**18. Assignment**

- 18.1 Neither the Purchaser nor the Supplier shall assign, in whole or in part, their obligations under this contract, except with prior written consent of the other party.

**19. Annual  
Maintenance  
Contract**

- 19.1 All the equipments along with their peripherals & accessories (including third party items) and all the software applications including OS amongst other not explicitly mentioned hereunder shall have to be covered by Annual Maintenance Contract (AMC) for Four (4) years.
- 19.2 AMC period will start after successful completion of Warranty period.
- 19.3 The bidder has to quote the total AMC charges per year separately for four year and enclose the detailed break-up of the AMC per year in terms of different items covered along with the bid. The charges quoted against AMC for four (4) years will be considered for commercial evaluation.
- 19.4 The AMC will include preventive as well as corrective maintenance.
- 19.5 In case of any defect in any of the equipments along with their peripherals & accessories (including third party items) during AMC period, the supplier shall arrange to replace/repair the defective part at his cost and ensure that the equipments and peripherals are in ready to use state throughout the currency of the contract.
- 19.7 During the AMC period for routine maintenance, repairing/replacement of all the supplied equipment should be done once in six months. All the repairing, maintenance, should be OEM certified.
- 19.8 AMC should also include supply, installation and maintenance of all the software upgrades as well as those already installed & commissioned as per scope of the tender with necessary additional hardware, if any, free of cost at the earliest.

19.9 The bidder has to ensure the availability of all the accessories for the machines throughout the currency of contract and has to provide the same to the purchaser free of cost as and when the same are required for smooth running of the equipments.

19.10 AMC charges shall be payable yearly after successful completion of the AMC services for that period against submission of bills. Any consequence loss (liquidated damage) amount levied on the bidder will be adjusted from that period's AMC charge.

## **Section 5 – Contract Forms**

### **Table of Forms**

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## NOTIFICATION OF AWARD

*[On letter head of the Purchaser]*

..... *[Date]*

To:  
*[Name and address of the Supplier]*

**Subject: Notification of Award for Contract No. ....**

This is to notify you that your Bid dated . . . *[Insert date]* . . . for execution of the . . . . .  
*[Insert name of the contract and identification number]* . . . . . for the Accepted Contract  
Amount of . . . . . *[Insert amount in numbers and words in Rupees]*, as corrected and  
modified in accordance with the Instructions to Bidders is hereby accepted by the Purchaser.

Contract Agreement to be executed is attached. You are requested to sign it with date and return  
it to the Purchaser within 15 days of the date of Notification of Award, along with the  
Performance Security for an amount of INR..... *[Insert amount equivalent to 10% of  
the Contract value]* valid up to..... *[Insert date]* in one of the forms stipulated in  
the GCC.

This concludes the Contract.

Authorized Signature: \_\_\_\_\_  
Name and Title of Signatory: \_\_\_\_\_  
Name of Agency: \_\_\_\_\_

**Attachment: Contract Agreement complete with Conditions of Contract**

# 1. CONTRACT AGREEMENT

*[The successful Bidder shall fill in this form in accordance with the instructions indicated]*

THIS CONTRACT AGREEMENT is made

the *[ insert: **number**]* day of *[ insert: **month** ]*, *[ insert: **year** ]*.

BETWEEN

- (1) *[ insert complete name of Purchaser]*, a *[ insert description of type of legal entity, for example, an agency of the Ministry of .... of the Government of {insert name of Country of Purchaser}, or corporation incorporated under the laws of {insert name of Country of Purchaser}]* and having its principal place of business at *[ insert address of Purchaser]* (hereinafter called “the Purchaser”), and
- (2) *[Insert name of Supplier]*, a corporation incorporated under the laws of *[insert: country of Supplier]* and having its principal place of business at *[insert: address of Supplier]* (hereinafter called “the Supplier”).

WHEREAS the Purchaser invited bids for certain Goods and ancillary services, viz., *[insert brief description of Goods and Services]* and has accepted a Bid by the Supplier for the supply of those Goods and Services at the Project Site, namely ....., in the sum of *[insert Contract Price in words and figures, expressed in Indian Rupees]* (hereinafter called “the Contract Price”).

*[Purchase should insert a Table here giving complete details of Goods and Related Services, quantities ordered, their prices and the accepted delivery schedule.]*

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 constitute the Contract between the Purchaser and the Supplier, and each shall be read and construed as an integral part of the Contract:
  - (a) This Contract Agreement
  - (b) The Purchaser’s Notification of Award
  - (c) Letter of Bid and original Price Schedules
  - (d) General Conditions of Contract
  - (e) Technical Requirements (including Schedule of Requirements and Technical Specifications)



3. This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above.
4. In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the Goods and Services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
5. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the Goods and 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 in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of *[insert the name of the Contract governing law country]* on the day, month and year indicated above.

For and on behalf of the Purchaser

Signed: *[insert signature]*  
in the capacity of *[insert title or other appropriate designation]*  
in the presence of *[insert identification of official witness]*

For and on behalf of the Supplier

Signed: *[insert signature of authorized representative(s) of the Supplier]*  
in the capacity of *[insert title or other appropriate designation]*  
in the presence of *[insert identification of official witness]*

**Attachment: Contract Conditions**  
*[Purchaser should attach the GCC]*

# Performance Security

## (Bank Guarantee)

*[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated]*

*[Guarantor letterhead or SWIFT identifier code]*

**Beneficiary:** Executive Engineer, Burdwan Investigation & Planning Division,  
Purta Bhavan, 3<sup>rd</sup> Floor Purba Bardhaman, 713103, WEST BENGAL,

**Date:** \_ *[Insert date of issue]*

**PERFORMANCE GUARANTEE No.:** *[Insert guarantee reference number]*

**Guarantor:** *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that \_ *[insert name of Supplier, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. *[insert reference number of the contract]* dated *[insert date]* with the Beneficiary, for the supply of \_ *[insert name of contract and brief description of Goods and related Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (\_\_\_\_\_) *[insert amount in words]*,<sup>1</sup> such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the .... Day of ....., 2...<sup>2</sup>, and any demand for payment under it must be received by us at this office indicated above on or before that date.

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<sup>1</sup> *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, and denominated either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Beneficiary.*

<sup>2</sup> *Insert the date sixty days after the Completion Date of the Supply or Completion of Warranty in case Warranty is applicable. The Purchaser should note that in the event of an extension of this date for completion of the Contract or the Warranty obligations, the Purchaser would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Purchaser might consider adding the following text to the form,*

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

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*[signature(s)]*

***Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.***

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*at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months]/[one year], in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."*

## Part 4

### Section 6

#### Bank Policy - Corrupt and Fraudulent Practices

Guidelines for Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, dated January 2011, revised July 2014.

#### “Fraud and Corruption:

1.16 It is the Bank’s policy to require that Borrowers (including beneficiaries of Bank loans), bidders, suppliers, contractors and their agents (whether declared or not), sub-contractors, sub-consultants, service providers or suppliers, and any personnel thereof, observe the highest standard of ethics during the procurement and execution of Bank-financed contracts.<sup>1</sup> In pursuance of this policy, the Bank:

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
  - (i) “corrupt practice” is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;<sup>2</sup>
  - (ii) “fraudulent practice” is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;<sup>3</sup>
  - (iii) “collusive practice” is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;<sup>4</sup>
  - (iv) “coercive practice” is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;<sup>5</sup>
  - (v) "obstructive practice" is:

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<sup>1</sup> In this context, any action to influence the procurement process or contract execution for undue advantage is improper.

<sup>2</sup> For the purpose of this sub-paragraph, “*another party*” refers to a public official acting in relation to the procurement process or contract execution. In this context, “*public official*” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

<sup>3</sup> For the purpose of this sub-paragraph, “*party*” refers to a public official; the terms “*benefit*” and “*obligation*” relate to the procurement process or contract execution; and the “*act or omission*” is intended to influence the procurement process or contract execution.

<sup>4</sup> For the purpose of this sub-paragraph, “*parties*” refers to participants in the procurement process (including public officials) attempting either themselves, or through another person or entity not participating in the procurement or selection process, to simulate competition or to establish bid prices at artificial, non-competitive levels, or are privy to each other’s bid prices or other conditions.

<sup>5</sup> For the purpose of this sub-paragraph, “*party*” refers to a participant in the procurement process or contract execution.

- (aa) deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation, or
  - (bb) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under paragraph 1.16(e) below.
- (b) will reject a proposal for award if it determines that the bidder recommended for award, or any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;
  - (c) will declare misprocurement and cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a recipient of any part of the proceeds of the loan engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices during the procurement or the implementation of the contract in question, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur, including by failing to inform the Bank in a timely manner at the time they knew of the practices;
  - (d) will sanction a firm or individual, at any time, in accordance with the prevailing Bank's sanctions procedures,<sup>6</sup> including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded a Bank-financed contract; and (ii) to be a nominated<sup>7</sup>;
  - (e) will require that a clause be included in bidding documents and in contracts financed by a Bank loan, requiring bidders, suppliers and contractors, and their sub-contractors, agents, personnel, consultants, service providers, or suppliers, to permit the Bank to inspect all accounts, records, and other documents relating to the submission of bids and contract performance, and to have them audited by auditors appointed by the Bank.”

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<sup>6</sup> A firm or individual may be declared ineligible to be awarded a Bank financed contract upon: (i) completion of the Bank's sanctions proceedings as per its sanctions procedures, including, inter alia, cross-debarment as agreed with other International Financial Institutions, including Multilateral Development Banks, and through the application the World Bank Group corporate administrative procurement sanctions procedures for fraud and corruption; and (ii) as a result of temporary suspension or early temporary suspension in connection with an ongoing sanctions proceeding. See footnote 14 and paragraph 8 of Appendix 1 of these Guidelines.

<sup>7</sup> A nominated sub-contractor, consultant, manufacturer or supplier, or service provider (different names are used depending on the particular bidding document) is one which has either been: (i) included by the bidder in its pre-qualification application or bid because it brings specific and critical experience and know-how that allow the bidder to meet the qualification requirements for the particular bid; or (ii) appointed by the Borrower.