

**Hydrology Project**  
**(IDA Credit 2774-IN)**

**INTERNATIONAL COMPETITIVE BIDDING**

**FOR**

**Procurement of**  
**BOAT – MOUNTED**  
**INTEGRATED BATHYMETRIC SYSTEM**

**for**

**RESERVOIR SEDIMENTATION SURVEY**

**JANUARY – 2000**

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SECTION-1. INVITATION FOR BIDS (IFB)

**INTERNATIONAL COMETITIVE BIDDING  
FOR SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF  
BOAT MOUNTED INTEGRATED BATHYMETRIC SYSTEM FOR RESERVOIR  
SEDIMENTATION SURVEY**

IFB No. WRI/SK/HP/ICB-1

DATED: 24.07.2000

1. The Government of India has received for a Credit from the International Development Association in various currencies towards the cost of Hydrology Project. It is intended that part of the proceeds of the credit will be applied to eligible payments under 9 (nine) separate contacts for Supply and Commissioning of Boat – Mounted integrated Bathymetric System for Reservoir Sedimentation Survey.
2. The Superintending Engineer, Water Resources Investigation Circle No. 1, Polytechnic Compound, Ahmedabad – 380 015, Gujarat (India) on behalf of the Government of India (for the Central Water and Power Research Stations, Pune), Gujarat, Orissa, Madhya Pradesh, Maharashtra, Andhra Pradesh, Tamil Nadu, Karnataka and Kerala now invites sealed bids from eligible bidders for the supply, and Commissioning of 11 (eleven) sets of Boat – mounted Integrated Bathymetric System (each set comprising of six components namely and Echo Sounder, a sound Velocity Calibrator, a differential Global Positioning System, a Data Collection Computer and three Bathymetric Software, all housed in an FRP boat equipped with two outboard engines, a boat trailer and voice radio) for conducting reservoir sedimentation survey.

| S.No. | Item  | Qty.    | Bids Security   |
|-------|---|---------|-----------------|
| 1     | Supply, Installation, Testing, Training and Commissioning of Boat Mounted Integrated Bathymetric System for Reservoir Sedimentation Survey. | 11 Nos. | Rs. 20,00,000/- |

**Bid Security in the currency of Bid is Rupees or equivalent to US \$. or in the currency of the bid.**

3. Interested eligible Bidders may obtain further information from and inspect the bidding documents at the office of the **Executive Engineer, Water Resources Investigation Division, Bhadra Fort, Lal Darwaja, Ahmedabad-380 001 (Gujarat – INDIA)** between 1100 hours and 1600 hours on all working days. Telephone No. 91 (079) 5507098; Fax No. 91 (079) 5507098, 91 (079) 5507019. Email Address [eewrldn@ad1.vsnl.net.in](mailto:eewrldn@ad1.vsnl.net.in)

A pre-bid meeting will be held at 1100 hours on 22.08.2000 at the Committee Room, 4<sup>th</sup> floor, Block No. 9, New Sachivalaya, Sector-10, Gandhinagar, Gujarat – India.

4. A complete set of three bidding documents in English language may be purchased by interested bidder, on the submission of a written application to the office of Executive Engineer, Water Resources Investigation Division, Bhadra Fort, Lal Darwaja, Ahmedabad – 380 001 (Gujarat – INDIA) and upon payment of a non refundable fee of Indian Rs. 10,000/- (INR Ten thousand only) or equivalent in US \$ / UK pound sterling, by cash or Demand Draft in favour of the Executive Engineer above mentioned and payable at Ahmedabad – 380 001 (Gujarat – India). Bidding documents will be on sale on all working days between 27.07.2000 to 13.09.2000. The Executive Engineer will not be responsible for any misplacements or delay in the receipt of bidding document by the bidder.
5. The provisions in the Instructions to Bidders and in the General Conditions of contract are the provisions of the World Bank Standard Bidding Documents – Procurement of Goods.
6. Bids must be delivered to The Superintending Engineer, Water Resources Investigation Circle – 1, Polytechnic Compound, Ahmedabad – 380 015 (Gujarat – INDIA) on OR before 13.00 Hrs. (IST) on 14.09.2000 and accompanied by Bid Security of Indian Rupees 19.08.000.00 (INR 1.98 Million) or equivalent in US \$ / UK pound sterling. Bid received late will be rejected.
7. Bids will be opened in the presence of bidder's representatives who choose to attend at 13.30 Hrs. (IST) on 14-09-2000 at the office of the Superintending Engineer, Water Resources Investigation Circle – I, Polytechnic Compound, Ahmedabad – 380 015 (Gujarat- INDIA).
8. The Bidders must offer bid for full quantity of the items falling which the Bid shall be considered as non-responsive. The Bids would be evaluated and contract awarded accordingly.

**HYDROLOGY PROJECT  
(Cr. 2774-IN)**

**SPECIFIC PROCUREMENT NOTICE**

**for**

**INTERNATIONAL COMPETITIVE BIDDING**

**PROCUREMENT OF BOAT MOUNTED BATHYMETRIC SYSTEM**

1. The **Govt. of India** has received a **Credit** from the International Development Association in various currencies towards the cost of **India: Hydrology Project**. It is intended that parts of the proceeds of the credit will be applied to eligible payments under 9 (nine) separate contacts for **Supply and Commissioning of Boat - Mounted Integrated Bathymetry System for Reservoir Sedimentation Survey**.
2. **The Superintending Engineer WRI Circle No. 1, Polytechnic Compound, Ahmedabad - 380 015, Gujarat (India)** on behalf of the Governments of India (for the Central Water and Power Research Station, Pune), Gujarat, orissa, Madhya Pradesh, Maharashtra, Andhra Pradesh, Taaamil Nadu, Karnataka and Kerala invites sealed bid from eligible bidders for the supply and commissioning of 11 (eleven) sets of Boat mounted Integrated Bathymetry System (each set comprising of six components namely and Echo Sounder, a Sound Velocity Calibrator, a Differential Global Positioning System, a Data Collection Computer and three Bathymetry Software, all housed in an FRP boat equipped with two outboard engines, a boat trailer and voice radio) for conducting Reservoir Sedimentation Survey.
3. Interested eligible bidders may obtain further information from and inspect the bidding documents at the office of the Executive Engineer, WRI Division No. 1, Bhadra Fort, Lal Darwaza, Ahmedabad – 380 013 (Gujarat – India) between 1100 hours and 1600 hours on all working days. Telephone No. 91 (079) 5507098; Fax No. 91 (079) 5507098 or 91 (079) 5507019.

A pre-bid clarification meeting will be held at the office of the Superintending Engineer, WRI Circle No. 1, Polytechnic Compound, Ahmedabad 380 015.

4. A complete set of three building documents in English language may be purchased by interested bidders on the submission of a written application to the office of the Executive Engineer, WRI Division No. 1, Bhadra fort, Lal Darwaja, Ahmedabad 380 013 (Gujarat – India) and upon a payment of a non refundable fee of Indian Rupees 3500 (INR three thousand five hundred only) or equivalent in US\$/UK Pound Sterling, by cash or Demand Draft in favour of the Executive Engineer above mentioned and payable at Ahmedabad (Gujarat – India). The Executive Engineer will not be responsible for any misplacements or delay in the receipt of the bidding documents by the bidder.

5. The provisions in the Instructions to the Bidders and in General Conditions of Contract are the provisions of the World Bank Standard Bidding Documents: *Procurement of Goods*.
6. Suppliers from the World Bank eligible countries who have been in previous experience with similar works and who are interested to supply are invited to contact for further details in writing, or by fax or by e-mail to:
  - The Superintending Engineer (Attn.: Mr. M. K. Jadhav, Superintending Engineer), Water Resources Circle No. 1, Polytechnic Campus, Ahmedabad – 380 015, Fax: 00 020 4392004.
  - The HP Consultants (Attn.: Mr. R. K. Visvanath, Dy. Team Leader), CSMRS Building, 1vth floor, Olof Palme Marg,, New Delhi – 110 016 Tel.: 00 91 11 6861681-84, Fax 00 91 11 6861685, e-mail – [dhvdelft@del2.vsnl.net.in](mailto:dhvdelft@del2.vsnl.net.in)/[hydrologyproject@vsnl.com](mailto:hydrologyproject@vsnl.com)

**Hydrology Project**  
**(IDA Credit 2774 – IN)**

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**Procurement of**  
**INTEGRATED BATHYMETRIC SYSTEMS**  
**for**  
**RESERVOIR SEDIMENTATION SURVEY**

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**INTERNATIONAL COMPETITIVE BIDDING**

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**FEBRUARY 1999**

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# **Section I**

## **Invitation for Bids**



# Invitation for Bids

Date of issuance of IFB: \_\_\_\_\_

Loan No.: Credit 2774 – IN

IFB No.: ICB/GOG/WRI/ /

1. The Government of India has received a credit from the International Development Association in various currencies towards the cost of the Hydrology Project. It is intended that part of the proceeds of this credit will be applied to eligible payments under the contract for Procurement of Integrated Bathymetric Systems for Reservoir Sedimentation Survey.
2. The Chief Engineer (D) and Jt. Secretary, Narmada Water Resources Department, Block No. 9, Sachivalaya Complex, Gandhinagar – 382 010, Gujarat, India on behalf of the State of Gujarat, Orissa, Maharashtra, Andhra Pradesh, Tamilnadu, Karnataka, Kerala and CWPRS, Pune (Maharashtra) now invites sealed bids from eligible bidders for the supply, installation and support of nine (9) sets of Integrated Bathymetric System comprising of Echo-Sounder, Sound Velocity Calibrator, Differential Global Positioning System, Data Collection Computer and Bathymetry Software for conducting Reservoir Sedimentation Survey.
3. Interested eligible bidders may obtain further information from and inspect the bidding documents at the office of The Executive Engineer, WRI Division, Bhadra Fort, Lal Darwaza, Ahmedabad – 380 013 (Gujarat) on any working day during office hours, between \_\_\_\_\_ and \_\_\_\_\_ (dates).
4. A complete set of bidding documents may be purchased by interested bidders, by submission of written application to the above and upon payment of a nonrefundable fee of equivalent to Indian Rupees (Rs) 5,000/-. Bidders who wish to receive the bidding documents through courier service can do so upon payment of equivalent of India Rupees (Rs.) 6000/-. Payments are to be made in cash or by demand draft in favour of the Executive Engineer, WRI Division, Bhadra Fort, Lal Darwaza, Ahmedabad – 380 013 (Gujarat), who will not be responsible for any misplacements or delay in the receipt of bidding document through courier services.
5. The provisions in the Instruction to Bidders and in the General Conditions of Contract are the provisions of the World Bank *Standard Bidding Documents: Procurement of Information Systems, International Competitive Bidding*.
6. Bids must be delivered to the above office on or before 1430 hours on [date] and will be opened in public immediately thereafter at 1500 hours in the presence of the representatives of Bidders who choose to attend. In the event of the date specified for bid receipt and opening being declared as a closed holiday for the Purchaser's Office, the due date for submission of bids and opening of bids will be the following working day at the appointed times.

7. All bids must be accompanied by a security of equivalent of Indian Rupees (Rs.) 1,250,000/- in the form of (a) a demand draft, or (b) a bank guarantee or irrevocable Letter of Credit issued by a reputable bank selected by the Bidder.
8. Address for communication:

Phone:

Telex:

Fax:



# **Section II**

## **Instructions to Bidders**

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## **A. Introduction**

### **1 Source of Funds**

- 1.1 The Borrower named in the Bid Data Sheet has applied for or received a loan or a credit (hereinafter called “loan”) from the International Bank for Reconstruction and Development or the International Development Association (as identified in the Bid Data Sheet and hereinafter interchangeably called “the Bank”) in various currencies equivalent to the US dollar amount indicated in the Bid Data Sheet towards the cost of the Project specified in the Bid Data Sheet. The Borrower intends to apply a portion of the proceeds of this loan to eligible payments under the contract for which this Invitation for Bids is issued.
- 1.2 Payments by the Bank will be made only at the request of the Borrower and upon approval by the Bank, in accordance with the terms and conditions of the Loan Agreement, and will be subject in all respects to the terms and conditions of that agreement. The Loan Agreement prohibits a withdrawal from the loan account for the purpose of any payment to persons or entities, or for any import of products, if such payment or import, to the knowledge of the Bank, is prohibited by a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the loan proceeds.

### **2 Eligible Bidders**

- 2.1 This Invitation for Bids (IFB) is open to all suppliers from eligible source countries as defined in *Guidelines: Procurement under IBRD Loans and IDA Credits*, January 1995 (revised January and August 1996) (hereinafter referred to as *IBRD Guidelines for Procurement*), except as provided hereinafter.
- 2.2 Bidders should not be associated, or have been associated in the past, directly or indirectly, with a firm or any of its affiliates which have been engaged by the Purchaser to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the Integrated Bathymetric Systems to be purchased under this IFB.
- 2.3 Government-owned enterprises in the Purchaser’s country may participate only if they are legally and financially autonomous, if they operate under commercial law, and if they are not a dependent agency of the Purchaser.
- 2.4 Bidders shall not be under a declaration of ineligibility for corrupt and fraudulent practices issued by the Bank in accordance with sub-clause 33.1.

### **3 Eligible Products and Services**

- 3.1 For the purpose of these Bidding Documents, the “Integrated Bathymetric Systems”, also called simply the “Systems,” means all of the products to be installed together with the related services to be provided by the selected Bidder under the contract.
- 3.2 All products and services to be delivered under the contract shall have their origin in eligible source countries, as defined in the *IBRD Guidelines for Procurement*, and all expenditures made under the contract will be limited to such products and services.
- 3.3 For purpose of this clause, “origin” means the place where the products are produced, or the place from which the services are supplied. Products are produced when, through software development, manufacturing, or substantial and major assembly or integration of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components. The origin of products and services is distinct from the nationality of the Bidder.
- 3.4 All products and services to be supplied under the contract must be eligible for export to the Purchaser’s country, under the existing regulations of the country(s) of origin, for projects similar to the project identified in the Bid Data Sheet. Bidders shall be responsible for obtaining all necessary export permits for the products and services to be supplied.

### **4 Cost of Bidding**

- 4.1 The Bidder shall bear all cost associated with the preparation and submission of its bids, and the Purchaser named in the Bid Data Sheet, hereinafter referred to as “the Purchaser”, will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

## **B. The Bidding Documents**

### **5 Content of Bidding Documents**

- 5.1 The contents of the Bidding Documents are listed below and should be read in conjunction with any addenda issued in accordance with ITB Clause 7:
- Section I. Invitation for Bids
  - Section II. Instruction to Bidders
  - Section III. Bid Data Sheet
  - Section IV. General Conditions of Contract (GCC)
  - Section V. Special Conditions of Contract (SCC)
  - Section VI. Schedule of Requirements
  - Section VII. Sample Forms
  - Section VIII. Technical Specifications
  - Section IX. Eligibility for the provision of Products and Services in Bank-Financed Procurements
- 5.2 Bidders are expected to examine all instructions, forms, terms, specifications and other information in the Bidding Documents. Failure to furnish all information required by the Bidding Documents or to submit a bid not substantially responsive to the Bidding Documents in every respect, will be at the Bidder's risk and may result in the rejection of its bid.

### **6 Clarification of Bidding Documents**

- 6.1 Bidders requiring clarification of the Bidding Documents may petition the Purchaser in writing or by cable (hereinafter, the term "cable" is deemed to include telex, electronic mail and facsimile) at the Purchaser's address indicated in the Bid Data Sheet. The Purchaser will respond in writing to any such petition received no later than twenty-one (21) days before the deadline for submission of bids, prescribed in the Bid Data Sheet. The Purchaser's written response (with an explanation of the query, but without identifying the source of inquiry) will be sent to all purchasers of the Bidding Documents.
- 6.2 When specified in the Bid Data Sheet, the Purchaser will organize and bidders may attend a pre-bid meeting and participate in a site visit at the times and places indicated in the Bid Data Sheet. The purpose of the pre-bid meeting will be to clarify issues and the Technical Specifications. Minutes of the meeting, including the questions raised and responses given, will be sent to all purchasers of the Bidding Documents.



## **7 Amendment of Bidding Documents**

- 7.1 The Purchaser may modify the Bidding Documents by issuing addenda, for any reason, and at any time prior to the deadline for submission of bids. Any addenda to the Biding Documents shall be part of the Bidding Documents, pursuant to ITB Clause 5. Modifications resulting form the prebid meeting shall be communicated exclusively through the issuance of a formal Addendum and not through the Minutes of the meeting.
- 7.2 All purchasers of the Bidding Documents will be notified of the addenda in writing or by cable, and it will be binding on them.
- 7.3 To allow bidders reasonable time to take any addenda into account in preparing their bids, the Purchaser will extend, as necessary, the deadline for the submission of bids. Any addenda issued less than twenty one (21) days prior to the deadline for submission of bids shall include an extension of at least fourteen (14) days.

## **C. Preparation of Bids**

### **8 Language of Bids**

8.1 Bids and all correspondence and documents relating to the bids exchanged by bidders and the Purchaser, shall be written in English. Supporting documents and printed literature furnished by bidders may be in another language, provided they are accompanied by an accurate translation of the relevant passages in English, in which case, for purpose of interpretation of the bid, the translation shall govern. Information supplied in another language without the proper translation shall be rejected.

### **9 Documents Comprising the Bid**

9.1 The bid submitted by the Bidder shall comprise the following:

- (a) the completed “Bid Form” and all Price Schedules duly signed by the Bidder and completed in accordance with ITB Clauses 10, 11 and 15;
- (b) bid security furnished in accordance with ITB Clause 14;
- (c) documentary evidence established in accordance with ITB Clause 12 that the Bidder is eligible to bid and is qualified to perform the contract if its bid is accepted;
- (d) documentary evidence established in accordance with ITB Clause 13 that the products and services to be supplied by the Bidder are eligible products and services and conform to the Bidding Documents; and
- (e) a full description of the technical solution(s), which must provide an acceptable solution to the business problems described in the Section VIII. Technical Specifications. Each bid shall contain only one technical and price solution. If a Bidder wishes to offer more than one solution, each must be submitted as a separate and complete bid with only one bid security required from each Bidder, and each such bid will be evaluated on its own merit. Any alternative proposal or other variations from the requirements of the Bidding Documents, including the mandatory technical specifications, will be at the Bidder’s own risk, pursuant to ITB Clause 5.2.

## 10. Bid Prices

- 10.1 The Bidder shall indicate the prices of the proposed Integrated Bathymetric Systems using the tables provided in the Bidding Documents.
- 10.2 Prices indicated on the Price and Recurrent Costs Schedules provided in the Bidding Documents shall be listed individually in the following manner:
- (a) Unit and total prices of products offered from abroad shall be quoted on a CIP or DAF point of entry or CIP named place of destination basis, as specified in the Bid Data Sheet, on the Imported Products Price Schedule, exclusive of all taxes and duties in the Purchaser's country. In quoting the price, the Bidder shall be free to use transportation through carriers registered in any eligible countries and may obtain insurance services from any eligible source country;
  - (b) Prices of products offered from within the Purchaser's country on the Locally Supplied Products Price Schedule, as follows:
    - (i) unit and total prices of products quoted EXW (exworks, ex-factory, ex-warehouse or off-the-shelf, as applicable), including all customs duties and sales or other taxes already paid or payable on previously imported products, or on the components or materials used in the production of the products;
    - (ii) any Purchaser country sales or other taxes that will be payable on the products if the contract is awarded.
  - (c) Unless otherwise specified in the Bid Data Sheet, Prices for Services, including all taxes payable by the Bidder thereon, broken down into the local and foreign currency components, on the Services Price Schedule.
  - (d) If specified in the Bid Data Sheet, recurrent costs during the Maintenance Period after the expiration of the Warranty Period on the Recurrent Costs Form, as follows:
    - (i) the cost of all diagnostic equipment, spare parts, consumables, supplies, software updates, recurrent licensing fees, and any other items needed to maintain operation of the Systems, plus any other recurrent supply of products specified in the Bidding Documents, quoted CIP or DAF if offered from abroad or EXW if offered from within the Purchaser's country;
    - (ii) the cost of all maintenance and technical support services, and any other recurrent services specified in the Bidding Documents, including all taxes payable by the Bidder thereon.
  - (e) Prices for inland delivery of the products, including transportation, insurance and all other local costs incidental thereto, for delivery to their destination on the Inland Delivery Price Schedule;

- (f) Total of bid, inland delivery Prices, and Recurrent Costs, subtotaled by currency and delivery basis (EXW or CIP or DAF) on the Bid Price Summary Form.
- 10.3 The terms “EXW, CIP, DAF” etc., shall be governed by the rules prescribed in the current edition of *INCOTERMS* published by the International Chamber of Commerce, Paris.
- 10.4 The Bidder’s separation of price components in accordance with ITB Clause 10.2 will be solely for purpose of facilitating the comparison of bids and will not in any way limit the Purchaser’s right to contract on any of the terms offered.
- 10.5 Prices quoted by the Bidder shall be fixed maximum prices during the Bidder’s performance of the contract and not subject to increase on any account, except for the maximum annual percentage increases quoted by the Bidder in the Recurrent Costs Schedule. Bids submitted with adjustable price quotations will be rejected.

## **11. Bid Currencies**

- 11.1 Prices for products and services offered from outside the Purchaser’s country shall be quoted in any currency of a Bank member country, or the European Currency Unit (ECU). If a Bidder wishes to be paid in a combination of different currencies, prices may be quoted accordingly but no more than three foreign currencies may be used.
- 11.2 Prices for products and services offered from within the Purchaser’s country and for inland delivery shall be quoted in the currency of the Purchaser’s country, unless otherwise specified in the Bid Data Sheet.

## **12 Documents Establishing Bidder’s Eligibility and Qualifications**

- 12.1 Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, documents establishing the Bidder’s eligibility to bid and its qualifications to perform the contract if its bid is accepted.
- 12.2 The documentary evidence of the Bidder’s eligibility to bid shall establish to the Purchaser’s satisfaction that the Bidder *and any subcontractors*, at the time of submission of the bid, are from an eligible country as defined under ITB Clause 2.
- 12.3 The documentary evidence of the Bidder’s qualifications and ability to perform the contract if its bid is accepted shall establish to the Purchaser’s satisfaction:
  - (a) that, in the case of a Bidder not doing business in the Purchaser’s country, the Bidder is or will be (if awarded the contract) represented in that country and is or will be able to carry out the installation,

support, maintenance, spare parts-stocking and other service obligations prescribed in the Bidding Documents;

- (b) that, in the case of a Bidder offering to supply products under the contract that it did not produce, the Bidder has been duly authorized by the subcontracted producer to supply the products in the Purchaser's country and to act on behalf of the producer, corroborated by a completed Producer's Authorization Form as provided in the Bidding Documents
- (c) that the Bidder and any partners and subcontractors have the financial, technical, and staff capabilities to support the Systems, and have successful performance history as specified in the Bid Data Sheet, appropriate for their role in fulfilling the contract; and
- (d) that a bid submitted by a joint venture of two or more firms as partners is signed so as to be legally binding on all partners and one of the partners is designated as being in charge, corroborated by a Power of Attorney defining signatories of all partners and specifically stating concurrence with all the terms and conditions defined in the GCC. A copy of the agreement(s) entered into by the joint venture or partners shall be included with the bid

### **13 Documents Establishing Products' Eligibility and Conformity to Bidding Documents**

- 13.1 Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bids, documents establishing the eligibility and conformity to the Bidding Documents of all products and services which the Bidder proposes to supply under the contract.
- 13.2 The documentary evidence of the eligibility of the products and services shall consist of a statement in the Price Schedule of the Country of Origin of each of the products and services offered that shall be confirmed by a Certificate of Origin issued at the time of shipment.
- 13.3 The documentary evidence of conformity of the products and services to the Bidding Documents may be in the form of written descriptions, literature, diagrams, certifications and client references, including:
  - (a) a detailed description of the essential technical and performance characteristics of the products;
  - (b) an item-by-item commentary on the Purchaser's Technical Specifications, demonstrating the substantial responsiveness of the products and services to those specifications, and any additional requirements specified in the Bid Data Sheet; and

- (c) a confirmation that the Bidder shall accept responsibility for the successful integration and interoperability of all proposed products as required by the Bidding Documents.
- 13.4 For purposes of the commentary to be furnished pursuant to ITB Clause 13.3(b), the Bidder shall note that any references to brand names, and model numbers designated by the Purchaser in its Technical Specifications, are intended to be descriptive only and not restrictive. The Bidder may substitute alternative brand/model names in its bid, provided that it demonstrates to the Purchaser's satisfaction that the substitutes ensure at least substantial equivalence to those referenced in the Technical Specifications.

## **14 Bid Security**

- 14.1 Pursuant to ITB Clause 9, the Bidder shall furnish, as part of its bid, a bid security in the amount specified in the Bid Data Sheet.
- 14.2 The bid security is required to protect the Purchaser against the risk of Bidder's conduct which would warrant the security's forfeiture, as per ITB Clause 14.7.
- 14.3 The bid security shall be denominated in the currency of the bid or in a freely convertible currency, shall be valid for thirty (30) days beyond the validity of the bid, and shall be in one of the following forms:
- (a) a bank guarantee or an irrevocable letter of credit issued by a reputable bank of the Bidder's choice, in the form provided in the Bidding Documents or another form acceptable to the Purchaser;
  - (b) a cashier's or certified cheque.
- 14.4 Any bid not secured in accordance with the ITB Clause 14.1 and 14.3 will be rejected by the Purchaser as nonresponsive, pursuant to ITB Clause 21.
- 14.5 Unsuccessful bidders' bid security will be discharged or returned as promptly as possible but not later than thirty (30) days after the expiration of the period of bid validity prescribed by the Purchaser pursuant to ITB Clause 15.
- 14.6 The successful Bidder's bid security will be discharged upon the Bidder signing the contract, pursuant to ITB Clause 31 and furnishing the performance security pursuant to ITB Clause 32.
- 14.7 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 Bid Form; or
  - (b) in case of a successful Bidder, if the Bidder fails to:
    - (i) sign the Contract in accordance with ITB Clause 31; and/or

- (ii) furnish performance security in accordance with ITB Clause 32.

## **15. Period of Validity of Bids**

- 15.1 Bids shall remain valid for the period specified in the Bid Data Sheet after the date of bid submission prescribed by the Purchaser, pursuant to ITB Clause 17. A bid valid for a shorter period shall be rejected by the Purchaser as nonresponsive.
- 15.2 In exceptional circumstances, the Purchaser may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing (or by cable). The bid security provided under ITB Clause 14 shall also be suitably extended. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request will not be required nor permitted to modify its bid, except as provided in ITB Clause 15.3.
- 15.3 If contract award is delayed by a period exceeding sixty (60) days beyond the expiration of the initial bid validity, the Contract Price will be adjusted by a factor specified in the request for extension.

## **D. Submission of Bids**

### **16. Format, Signing and Packaging of Bids**

- 16.1 The Bidder shall prepare an original and the number of copies of the bid specified in the Bid Data Sheet, clearly marking each “ORIGINAL BID” or “COPY OF BID”, as appropriate. In the event of any discrepancy between them, the original shall govern.
- 16.2 The original and copies of the bid shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to bind the Bidder to the contract, which authorization shall be corroborated by a written power of attorney accompanying the bid. All pages of the bid, except for unaltered printed literature, shall be initialed by the person or persons signing the bid. Any interlineation, erasures, or overwriting shall be valid only if initialed by the people signing the bid.
- 16.3 Bids shall be sealed in an envelope bearing the name and return address of the Bidder, be addressed to the Purchaser, bear the project and contract name and the Invitation for Bids (IFB) title and number, all as indicated in the Bid Data Sheet, and marked: “DO NOT OPEN BEFORE \_\_\_\_\_”, to be completed with the time and date specified in the Bid Data Sheet for ITB Clause 17.1.
- 16.4 If the envelopes are not sealed and marked as required by ITB Clause 16.3, the Purchaser will assume no responsibility for the bid’s misplacement or premature opening.
- 16.5 Bidders shall organize their bids in accordance with the format specified in the Section VI – Schedule of Requirements and Section VIII - Technical Specifications.
- 16.6 The Bidder shall furnish information as described in the Form of Bid on commissions or gratuities, if any, paid or to be paid to agents relating to this Bid, and to contract execution if the Bidder is awarded the contract.

### **17. Deadline for Submission of Bids**

- 17.1 Bids must be received by the Purchaser at the address specified in the Bid Data Sheet for ITB Clause 16.3 no later than the time and date specified in the Bid Data Sheet. Bids received after this deadline will be rejected and returned to the Bidder unopened.
- 17.2 The Purchaser may, at its discretion, extend this deadline for the submission of bids by amending the Bidding Documents in accordance with ITB Clause 7, in which case all rights and obligations of the Purchaser and bidders previously subject to the deadline will be thereafter be subject to the deadline as extended.



## **18. Modification and Withdrawal of Bids**

- 18.1 The Bidder may modify or withdraw its bid after submission, provided that the modification, substitution or written notice of withdrawal of the bid is received by the Purchaser prior to the deadline prescribed for submission of bids. No bid may be modified or withdrawn after the deadline for submission of bids, pursuant to ITB Clause 14.7.
- 18.2 The Bidder's modification or withdrawal notice shall be packaged and dispatched in accordance with ITB Clause 16. A withdrawal notice may be sent by cable, but must be followed by a signed original, postmarked not later than the deadline for submission of bids.
- 18.3 No bid may be withdrawn in the interval between the deadline for submission of bids and the expiration of period of bid validity specified by the Bidder on the Bid Form. Withdrawal of a bid during this interval may result in the Bidder's forfeiture of its bid security pursuant to ITB Clause 14.7.

## **19. Opening and Evaluation of Bids**

- 19.1 The Purchaser will open all bids at the place and time specified in the Bid Data Sheet. Bidders' representative may attend the opening, and those who are present shall sign a register evidencing their attendance.
- 19.2 The bidders' names, bid modifications or withdrawals, bid prices, discounts, and the presence or absence of requisite bid security and such other details as the Purchaser may consider appropriate, will be announced at the opening. No bid shall be rejected at bid opening, except for late bids which shall be returned unopened to the Bidder pursuant to ITB Clause 17.1
- 19.3 The Purchaser will prepare minutes of the bid opening.

## **20. Clarification of Bids**

- 20.1 During evaluation of bids, the Purchaser may, at its discretion, ask the Bidder for a clarification of its bid. The request for clarification and the response shall be in writing, and no change in the prices or substance of the bid shall be sought, offered, or permitted.

## **21. Preliminary Examination of Bids**

- 21.1 The Purchaser will examine the bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.
- 21.2 Computational errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and the quantity, the unit price shall prevail, and the total price shall be corrected. If there is a discrepancy between words and

figures, the amount in words will prevail. If the Bidder does not accept the correction of any errors, its bid will be rejected, and its bid security may be forfeited.

- 21.3 Prior to detailed evaluation, the Purchaser will determine whether each bid is substantially responsive to the Bidding Documents (including any amendments thereto). For purposes of the ITB, a substantially responsive bid is one which conforms to all the terms and conditions of the Bidding Documents and Addenda and the requirements of all mandatory technical specifications, without material deviations, as determined from the contents of bid itself, without recourse to extrinsic evidence. A material deviation is one which limits the scope of the Systems in any substantial way, and the acceptance of which deviation would affect unfairly the competitive position of other bidders presenting substantially responsive bids. Deviations from or objections or reservations to critical provisions, *such as* those concerning Bid Security (ITB Clause 14), Applicable Law (GCC Clause 10), Taxes and Duties (GCC Clause 20), will be deemed to be a material deviation.
- 21.4 A bid that is not substantially responsive will be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the nonconformity.
- 21.5 The Purchaser may waive any minor informality, nonconformity, or irregularity in a bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.

## **22. Conversion to Single Currency**

- 22.1 To facilitate evaluation and comparison, the Purchaser will convert all bid prices expressed in the various currencies in which they are payable to either:
  - (a) the currency of the Purchaser's country at the selling exchange rate established for similar transactions by the Central Bank or a commercial bank in the Purchaser's country; or
  - (b) a currency widely used in the international trade, such as US dollars, at the selling rate of exchange published in the international press for the amount payable in foreign currency; and at the selling exchange rate established for similar transactions by Central Bank in the Purchaser's country for the amount payable in the currency of the Purchaser's country.
- 22.2 The currency selected for converting bid prices to a common base for the purpose of evaluation and the date and source of the selling exchange rate are specified in the Bid Data Sheet.

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

- 23.1 The Purchaser will evaluate and compare the bids that have been determined to be substantially responsive, pursuant to ITB Clause 21.

- 23.2 The Purchaser’s evaluation of a bid will exclude and not take into account:
- (a) any Purchaser country sales or other taxes that will be payable on the products offered from within the Purchaser’s country, as per ITB Clause 10.2(b); and
  - (b) customs duties and other similar import taxes that will be payable on the products offered from abroad, as per ITB Clause 10.2(a).

23.3 The Purchaser’s evaluation of bids will take into account both cost and technical factors. A Bid Score (S) will be calculated for each responsive bid using the following formula, which weights the Bid Price and the total Technical Points awarded to the bid:

$$S = \frac{C_{\min}}{C} \times X + \frac{T}{T_{\max}} \times Y$$

where

- C = Evaluated Bid Price
- C<sub>min</sub> = the lowest of all Evaluated Bid Prices
- T = the total Technical Points for the bid
- T<sub>max</sub> = the maximum Technical Points awarded to any responsive bid
- X = weight of the Price Score as specified in the Bid Data Sheet
- Y = weight of the Technical Score as specified in the Bid Data Sheet

The *highest* responsive Bid Score is eligible for contract award.

23.4 The price comparison of bids shall be between the EXW price of the products offered from within the Purchaser’s country, in accordance with ITB Clause 10.2(b), and the “CIP or DAF point of entry” or “CIP named place of destination” price of the products offered from outside the Purchaser’s country, in accordance with ITB Clause 10.2(a). The Evaluated Bid Price for each responsive bid will also include all Recurrent costs, the cost of inland delivery of the products, and the cost of all Services required in the Bidding Documents. It will be determined using the following process:

- (a) Adjustment of the Bid Price and Recurrent Costs, as specified in the Bid Data Sheet, for the cost of:
  - (i) *Delays in bid installation schedule* within the maximum period specified in the Bid Data Sheet beyond the deliveries and installations specified in the Schedule of Requirements. Delayed deliveries or installations within this permissible range will result in an increase of the EXW or CIP or DAF prices by

the percentage specified in the Bid Data Sheet for each week of delay.

- (ii) *Deviations in bid payment schedule* from the schedule specified in the Special Conditions of Contract, if such deviation is considered acceptable to the Purchaser, bid price will be increased by the amount of interest that could otherwise be earned for any earlier payments involved in the proposed schedule, as compared to those stipulated in the Bidding Documents, at the annual interest rate specified in the Bid Data Sheet.
  - (iii) *Required products and services missing from the bid to be estimated based on the highest equivalent prices from the other responsive bids and added to the price of the bid in question.*
- (b) The Evaluated Bid Price (C) is calculated as the sum of the adjusted total Bid Price (P) and the Net Present Value of the adjusted Recurrent Costs (R), using the following formula:

$$C = P + \sum_{x=1}^N \frac{R_x}{(1+I)^x}$$

where

P = total Bid Price, adjusted as per ITB Clause 23.4(a) and 24.1

I = interest rate for Net Present Value from the Bid Data Sheet

R<sub>x</sub> = the total Recurrent Costs for year 'x' including adjustments as per ITB Clause 23.4(a)

N = number of years of Recurrent Costs from ITB Clause 10.2(d)

x = index representing each of the N years, in turn

## 24. Domestic Preference

- 24.1 If the Bid Data Sheet so specifies, the Purchaser will grant a margin of preference to products offered from within the Purchaser's country. The CIP or DAF components representing products offered from abroad, as listed on the Imported Products Price Schedule pursuant to ITB Clause 10.2(a), shall be increased by the applicable import tariff (custom duties and other import taxes) or fifteen (15) percent, whichever is less. If duties vary from item to item within a package, the appropriate tariff for each piece of equipment shall apply. No preference shall be applied for any associated services or works included in the Bid.
- 24.2 No margin of preference will be granted for any other price component and bidders will not be permitted or required to modify the source of any products or services after bid opening as a condition of contract award. Bidders quoting a pricing structure other than that specified herein may have their bids rejected.

## **25. Contacting the Purchaser**

- 25.1 Any effort by the Bidder to influence the Purchaser in the process of evaluating bids and in decisions concerning award of contract, will result in the rejection of the Bidder's bid. If the Bidder wishes to bring additional information to the notice of the Purchaser, he should do so in writing.

## **E. Post Qualification and Award of Contract**

### **26. Post Qualification**

- 26.1 The Purchaser will determine at its own cost and to its satisfaction whether the Bidder that is selected as having submitted the highest evaluated responsive bid is qualified to perform the contract satisfactorily, in accordance with ITB Clause 12 and 13 and the Technical Specifications.
- 26.2 The determination will take into account the Bidder's financial, technical, production and support capabilities, as well as confirmation of the Systems' claimed performance. It will be based upon an examination of the documentary evidence of the Bidder's qualifications and System specifications submitted by the Bidder, pursuant to ITB Clause 12 and 13, as well as other information as the Purchaser deems necessary and appropriate. This determination may include visits or interviews with the Bidder's clients referenced in its bid, site inspections, performance or functionality tests, and any other measures described in the Bid Data Sheet and/or the Technical Specifications.
- 26.3 An affirmative post-qualification determination will be a prerequisite for award of contract to the highest evaluated Bidder. A negative determination will result in rejection of the Bidder's bid, in which event the Purchaser will proceed to the next highest evaluated bid to make similar determination of that Bidder's capabilities to perform the contract satisfactorily.

### **27. Award Criteria**

- 27.1 Subject to ITB Clause 29, the Purchaser will award the contract to the Bidder whose bid has been determined to be substantially responsive and has been determined to have the highest bid score, provided further that the Bidder is determined to be qualified to perform the contract satisfactorily, pursuant to ITB Clause 26.

### **28. Purchaser's Right to Vary Quantities at Time of Award**

- 28.1 The Purchaser reserves the right at the time of contract award to increase or decrease, by the percentage indicated in the Bid Data Sheet, the quantity of products and services originally specified in the Schedule of Requirements without any change in unit prices or other terms and conditions.

### **29. Purchaser's Right to Accept any Bid and to Reject any or All Bids**

- 29.1 The Purchaser reserves the right to accept or reject any bid, or to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to the affected Bidder or bidders.

### **30. Notification of Award**

- 30.1 Prior to the expiration of the period of bid validity, the Purchaser will notify the successful Bidder in writing by registered letter, or by cable to be subsequently confirmed in writing by registered letter, that its bid has been accepted.
- 30.2 The notification of award will constitute the formation of the contract.
- 30.3 Upon the successful Bidder's furnishing of the performance security pursuant to ITB Clause 32, the Purchaser will promptly notify each unsuccessful Bidder and will discharge its bid security, pursuant to ITB Clause 14.

### **31. Signing of Contract**

- 31.1 At the same time as the Purchaser notifies the successful Bidder that its bid has been accepted, the Purchaser will send the Bidder the Contract Form provided in the Bidding Documents, incorporating all agreements between the parties.
- 31.2 Within thirty (30) days of receipt of the Contract Form, the successful Bidder shall sign and date the Contract and return it to the Purchaser. By mutual agreement, the contract signature date may be postponed by up to thirty (30) days.

### **32. Performance Security**

- 32.1 Within thirty (30) days of receipt of notification of award from the Purchaser, the successful Bidder shall furnish the performance security in accordance with the Conditions of Contract, using the Performance Security Form provided in the Bidding Documents or another form acceptable to the Purchaser.
- 32.2 Failure of the successful Bidder to comply with the requirements of ITB Clause 31 or ITB Clause 32.1 shall constitute sufficient ground for the annulment of the award and forfeiture of the bid security, in which event the Purchaser may make the award to the next highest evaluated Bidder or call for new Bids.

### **33. Corrupt or Fraudulent Practices**

- 33.1 The Bank requires that the Borrower (including beneficiaries of Bank loans), as well as Bidder/Suppliers/Contractors under Bank-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the Bank:
  - (a) defines, for the purpose of this provision, the terms set forth below as follows:

- (i) “Corrupt practice” means the offering, giving, receiving or soliciting of any thing of value to influence the action of a public official in the procurement process or in contract
- (ii) “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition;
- (iii) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practice in competing for the contract in question;
- (iv) will declare a firm ineligible, either indefinitely or for a stated period of time, to be awarded a Bank-financed contract if it at any time determines that the firm has engaged in corrupt or fraudulent practices in competing for or in executing a Bank-financed contract.

33.2 Furthermore, Bidders shall be aware of the provision stated in sub-clause 14.6 and sub-clause 23.1 (c) of the General Conditions of Contract.



## **Section III**

### **Bid Data Sheet**

The Following specific data for the products and services to be procured shall complement, supplement, or amend the provisions in the Instruction to Bidders (ITB). Whenever there is a conflict, the provisions herein shall prevail over those in the ITB.

| <b>INTRODUCTION</b> |   |
|---------------------|---|
| ITB 1.1             | Name of the Borrower: Government of India<br>Loan or Credit number: IDA Credit 2774-IN<br>Loan or credit amount: US\$ 142 millions  |
| ITB 1.1 & 16.3      | Name of Project: Hydrology Project  |
| ITB 1.1 & 16.3      | Name of Contract: PROCUREMENT OF INTEGRATED BATHMETRIC SYSTEMS FOR RESERVOIR SEDIMENTATION SURVEY comprising of Echo-Sounder, Sound Velocity Calibrator, Differential Global Positioning System, Data Collection Computer and Bathymetry Software for data acquisition, storage and processing.<br><br>The Bid will be evaluated and contract awarded as a whole on “turn key” basis. |
| ITB 4.1 & 16.3      | Name of Purchaser: As per list of Consignees.   |
| ITB 6.1             | Purchaser’s address : [ Purchaser’s address, telephone, telex, and facsimile numbers]<br>These are furnished in the “Consignee Statement” attached to Section VI – Schedule of Requirements.  |
| ITB 6.2 & 6.3       | Dates, times and places for the pre-bid meeting :<br><br>The Prebid meeting will be held on .....at ..... hours at .....  |

| <b>BID PRICES AND CURRENCY</b> |  |
|--------------------------------|--|
| ITB 10.2 (a)                   | Prices for products offered from abroad shall be quoted as : CIP named place of destination furnished in Section VI – Schedule of Requirements. The Bidder will be required to supply and install the Integrated Bathymetric System at the named places of destination. Purchaser will only obtain customs clearance after filing the Bill of Entry and payment of necessary Customs duty. All other activities such as port clearance and transport to ultimate destination etc. shall be done by the Supplier. |
| ITB 10.2 (b)                   | Add the following at the end of this Clause :<br><br>“ <b>Note</b> : Bidders may like to ascertain availability of Deemed Export Benefits. They are solely responsible for obtaining such benefits which they have considered in their bid and in case of failure to receive such benefits, the Purchaser will not compensate the bidder.  |

|                         |   |
|-------------------------|---|
|                         | <p>Where the bidder has quoted taking into account the Deemed Export Benefits, he must give all information required for issue of Project Authority/Payment Certificate in terms of the Import Export Policy along with his bid in Form 10 of Section VII. The Project Authority/Payment Certificate will be issued on this basis only and no subsequent change will be permitted. Where such Certificates are to be issued by the Purchaser, Excise Duty will not be reimbursed separately.</p> <p>Bids which do not conform to this provision, will be treated as non-responsive and rejected”.</p>   |
| ITB 10.2 (b) (i)        | Insert the words, “excise and other” in between the words “customs” and “duties” in line 3 of this sub-clause.  |
| ITB 10.2 (d) & 23.4 (b) | The “Maintenance Period” (N) for Recurrent Costs to be included in the evaluation process shall be three (3) years after the expiration of the Warranty Period (which is as defined in GCC/SCC).  |
| ITB 11.1                | Delete the words “from outside the Purchaser’s Country” in lines 1 and 2.   |
| ITB 11.2                | Delete the words “for products and services offered from within the Purchaser’s Country and” and in lines 1 and 2.<br><br>The currency to be used for inland transportation is Indian Rupees.   |
| ITB 11.3                | <p>Add the following as Clause 11.3 :</p> <p>“11.3 Agents and service facilities in India :</p> <p>(a) If a foreign bidder has engaged an Indian agent, it will be required to give the following details in the offer ;</p> <p>(i) the name and address of the local agent;</p> <p>(ii) what service the agent renders; and</p> <p>(iii) the fixed amount of remuneration for the agent included in the offer.</p> <p>(b) The agency commission shall be indicated in the space provided for in the price schedule and will be paid to the bidder’s agent in India in Indian Rupees using the Telegraphic Transfer buying market rate of exchange ruling on the date of award of contract and shall not be subject to any further exchange variation</p> |

## PREPARATION AND SUBMISSION OF BIDS

|              |  |
|--------------|--|
| ITB 12.3 (b) | <p>Modify as below:</p> <p>that the Bidder offering to supply products under the contract , that it did not produce, the Bidder shall furnish with the bidding document completed Producer’s Authorization Form (Form 9 of Section VII) at least for (i) Echo-sounder, (ii) Differential Global Positioning System, and (iii) Bathymetry Software for data acquisition, storage and processing; and (iv) Survey Boat fitted with outboard engine and trailer.</p>  |
| ITB 12.3 (c) | <p>Qualification requirements for bidders are that:</p> <ul style="list-style-type: none"> <li>(i) it is in the business of manufacture and supply of similar equipment for a minimum period of three years;</li> <li>(ii) it has during the past five years designed, manufactured, tested and supplied at last three integrated Bathymetric systems consisting of at least any three of the five components.</li> <li>(iii) the integrated system supplied should have been in successful operation for at least one year as on the date of bid;</li> <li>(iv) its annual financial turnover in any one of the last three years is not less than Rs.70 million (US\$ 1.75 million approximately).</li> </ul>   |
| ITB 12.3 (d) | <p>Add the following new clauses 12.3 (d), (e) and (f)</p> <p>Bids submitted by a joint venture of two or more firms as partners shall comply with the following requirements:</p> <ul style="list-style-type: none"> <li>a. The bid shall include all the information listed in Sub Clause 12.1 &amp; 12.2 above;</li> <li>b. The bid and, in case of a successful bid, the Agreement, shall be signed so as to be legally binding on all partners;</li> <li>c. One of the partners shall be nominated as being in charge, and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the partners;</li> <li>d. All partners of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms and conditions defined in the GCC and a statement to this effect shall be included in the authorization mentioned under (c) above, as well as in the bid and in the Agreement (in case of a successful bid);</li> <li>e. The proposed participation of each of the joint venture partners in respect of design, supply and maintenance of hardware, software or service support and training should be stated clearly in the joint venture agreement, and should not be changed without the prior written approval of the Purchaser</li> </ul> |

|              |  |
|--------------|--|
|              | <p>f. The partner in charge shall be authorized to incur liabilities and receive any instructions for and on behalf of any and all partners of the joint venture and the entire execution of the contract, including payment, shall be done exclusively with the partner in charge;</p> <p>g. The Joint venture agreement should be legally enforceable and registered in India;</p> <p>h. The bid and performance security of a joint venture must be in the name of the Joint Venture submitting the bid;</p> <p>i. A copy of the agreement entered into by the joint venture partners shall be submitted with the bid; and</p> <p>j. Performance Statement in Form 11 of Section VII should be furnished.</p> |
| ITB 12.3 (e) | <p>That adequate, specialised hardware, related software expertise are already available or will be made available following the execution of the Contract, in the Purchaser's country, to ensure that the support services are responsive; and :</p> <p>i) That the Bidder has adequate experience in providing technical project management; and</p> <p>ii) That the Bidder will assume total responsibility for the integrated operation of Bathymetric Systems for three years after end of warranty period.</p>   |
| ITB 12.3 (f) | <p>That the Bidder selected for the award of the Contract shall be responsible both for complying with any applicable export regulations and for obtaining the necessary export license in the country of origin. To this effect Bidder shall provide along with his bids, a document stating that it expects to obtain the required export license for the equipment, specified in the Technical Specifications within thirty five (35) days of the Contract signature date.</p>  |
| ITB 13.5     | <p>Add the following as sub clauses 13.5., 13.6 and 13.7</p> <p>The Bidder shall submit a confirmation that the system and other software manufactured by another company operates efficiently on the system offered by the Bidder and that the Bidder accept responsibility for its successful operation.</p>   |
| ITB 13.6     | <p>The Bidder shall submit a confirmation that similar or compatible hardware will be made available in the Purchaser's country to provide adequate emergency processing arrangements.</p>   |
| ITB 13.7     | <p>The Bidder should submit a confirmation to the effect that the hardware and software offered take care of year 2000 calculations.</p>   |
| ITB 14.1     | <p>The amount of bid security required is equivalent of Indian Rupees 1,850,000/-</p>  |

|                        |   |
|------------------------|---|
| ITB 14.3               | <p>Modify the words ‘ a freely convertible currency’ as US dollars” in lines 1 and 2.</p> <p>Insert the words “ or Indian Rupees” in between the word “bid” and “or” in line 1.</p> <p>Modify the words “thirty (30)” in line 2 as “forty five (45)”</p>  |
| ITB 14.3 (b)           | Substitute “ a cashier’s or certified check” by the words “Demand Draft”  |
| ITB 15.1               | The bid validity period shall be one hundred and twenty (120) days.   |
| ITB 16.1               | Required number of copies of the Bid : Four (4)   |
| ITB 16.3               | <p>The IFB title and number are : Supply and installation of Integrated Bathymetric System for Reservoir Sedimentation Survey comprising of Echo-Sounder, Sound Velocity Calibrator, Differential Global Positioning System, Data Collection Computer and Bathymetry Software for data acquisition, storage and processing.</p> <p>No. ICB/GOG/WRI/ /</p>   |
| ITB 16.3 & 17.1 & 19.1 | <p>The address for bid submission is :</p> <p>Deadline for bid submission : [date and time]</p> <p>Time, date and place for bid opening are :</p> <p>In the event of the date specified for bid receipt and opening being declared as a closed holiday for the Purchaser’s office, the due date for Submission of bids and opening of bids will be the following working days at the appointed times.</p> |
| ITB 17.3               | Telex, cable or facsimile bid shall be rejected.  |
| ITB 18.2               | Add the word fax in between cable and but   |
| ITB 20.2               | <p>Add the following as Sub-clauses 20.2, 20.3</p> <p>“Subject to sub-clause 20.1, no Bidder shall contact the Employer on any matter relating to its bid from the time of opening to the time the contract is awarded. If the Bidder wishes to bring additional information to the notice of the Purchaser, it should do so in writing”</p>  |
| ITB 20.3               | “Any effort by the Bidder to influence the Purchaser in the Purchaser’s bid evaluation, bid comparison or contract award decisions may result in the rejection of the Bidder’s bid.”  |

|          |   |
|----------|---|
| ITB 21.1 | Add the following at the end of this clause as Sub-Paragraph<br><br>“Bids from Agents without proper authorization from the products / manufacturer as per ITB Clause 12.3 (b) shall be treated as non – responsive”  |
| ITB 21.3 | Add the following clauses as additional critical provisions, deviations from or objections or reservations to which will be treated as material deviations:<br><br>“Performance Security “ (GCC Clause 17)<br>“Deemed Export” [Note under 10.2 (b) of ITB];<br>“Warranty” (GCC Clause 34 and SCC Clause 15); and<br>“Force Majeure” (GCC Clause 26)<br>“Limitation of Liability” (GCC Clause 27)<br>“Product Support” (GCC Clause 35) |

| <b>BID EVALUATION</b> |  |
|-----------------------|--|
| ITB 22.2              | The currency chosen for the purpose of converting to a common currency is : Indian Rupees.<br><br>The source of exchange rate is : BC selling market exchange rates established by State Bank of India.<br><br>The date of exchange rate determination is : Date of opening of Bids.   |
| ITB 23.3              | The formula and weighting factors for Bid Scores are :<br><br>$S = \frac{C_{min}}{C} \times X + \frac{T}{T_{max}} \times Y$<br>X (weight of the Evaluated Bid Price Score) = [40%]<br>Y (weight of the Technical Score) = [60%]  |
| ITB 23.3              | The preferred technical features will be scored on a sliding scale from 0 to 100% of the points allocated, based on performance and features relative to other responsive bids. The preferred features are grouped into categories, and the Technical Score (T) for each bid is calculated as a weighted sum of the total points awarded to the preferred features. The formula for evaluating technical scores is typically the following :<br><br>$T = a \times ES + b \times SV + c \times GP + d \times RL + e \times PC + f \times BS + g \times PS + h \times SI + i \times TR$<br>[The weights, i.e. the small letters in the formula, are denominated in the Technical Evaluation Table below. The same table shows the denomination of the evaluation subjects.]: |

|              | <b>Subject</b>  | <b>Subject code</b> | <b>Weight code</b> |
|--------------|---|---------------------|--------------------|
|              | echosounder   | ES                  | a                  |
|              | sound velocity calibrator   | SV                  | b                  |
|              | DGPS  | GP                  | c                  |
|              | digital radio link  | RL                  | d                  |
|              | data collection computer  | PC                  | e                  |
|              | Bathymetric software  | BS                  | f                  |
|              | power supply  | PS                  | g                  |
|              | system integration  | SI                  | h                  |
|              | Training  | TR                  | i                  |
| ITB 23.4 (a) | The applicable bid price adjustments for evaluation purposes are :  |                     |                    |
| (i)          | Installation (on completion of acceptance testing) can be offered up to a maximum of twelve (12) weeks beyond the schedule specified in the Schedule of Requirements. |                     |                    |
| (ii)         | The percentage for adjustments for delayed installation is one-half (1/2) percent of the bid price per week.  |                     |                    |
| (iii)        | The percentage adjustment for payment schedule deviations is :<br>Fourteen (14) per cent per annum.   |                     |                    |
| ITB 23.4 (b) | Interest Rate (I) for net present value calculations of recurrent costs = Ten (10) percent.   |                     |                    |
| ITB 24       | A margin of domestic preference will apply ; and the basis of application will be CIP named place of destination.   |                     |                    |

| <b>CONTRACT AWARD</b> |  |
|-----------------------|--|
| ITB 26                | Applicable post qualification measures are indicated in Section VIII – Technical Specifications        |
| ITB 28.1              | Percentage for quantity increase or decrease : Fifteen (15) per cent rounded to the next whole number. |
| ITB 31.2 & 32.1       | Substitute the words “thirty (30)” appearing in line 1 by the words “twenty-one (21).                  |



## **Section IV**

# **General Conditions of Contract**

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### SECTION IV GENERAL CONDITIONS OF CONTRACT

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# A. Contract and Interpretation

## 1. Definitions

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

- (a) “The Contract” means the agreement entered into between the Purchaser and the Supplier, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by the reference therein.
- (b) “The Contract Price” means the price payable to the Supplier under the Contract for the full and proper performance of all its contractual obligations. The extent to which the Recurrent Costs as identified in the Supplier’s bid during the Maintenance Period are included in the Contract Price is specified in SCC.
- (c) “GCC” means these General Conditions of Contract in Section IV.
- (d) “SCC” means the Special Conditions of Contract in Section V.
- (e) “The World Bank” means the International Bank for Reconstruction and Development (IBRD) or the International Development Association (IDA).
- (f) “The Purchaser” means the organization purchasing the Integrated Bathymetric Systems, as named in SCC.
- (g) “The Purchaser’s country” is the country named in SCC.
- (h) “The Supplier” means the firm or joint venture supplying the Integrated Bathymetric Systems under this Contract, as named in SCC.
- (i) “Subcontractor” means any entity that is directly or indirectly subcontracted by the Supplier to deliver any Services or supply any Products, including supply of Products as third party producer.
- (j) “The Integrated Bathymetric Systems” also called simply “the Systems” means all the Products to be installed, integrated, developed, customized and made operational, together with the Services to be delivered by the Supplier under the Contract.
- (k) “The Services” means those services associated with the supply of the Systems, as defined in the Contract.
- (l) “The Products” means all of the Equipment, Hardware, Software, supplies and consumable items that the Supplier is required to install or provide under the Contract, plus the associated documentation.

- (m) “Software” means instructions that cause data processing systems to perform in a specific manner or execute specific operations.
- (n) “Standard Software” means system and general purpose Software, System Software includes the operating systems, communication and network software, Systems and Network management utilities. General purpose Software includes word processing, spreadsheet, generic database management and application development software.
- (o) “Application Software” means business or technical Software either packaged or custom-developed using Standard Software, formulated to interface with the users of the data processing system.
- (p) “Custom Software” means either Standard or Application Software developed by the Supplier at the Purchaser’s expense under the Contract, including customization made to packaged Software.
- (q) “Source Code” means the database structures, dictionaries, definitions, program source files and any other symbolic representations necessary for the compilation, execution and subsequent maintenance of the Custom and/or Application Software.
- (r) “The Project Sites” means the place or places named in the Schedule of Requirements for delivery and installation of the Systems.
- (s) “The Effective Date” means the date following contract signing that the Contract enters into full force and effect with respects to the scheduled Installation dates for the Systems, as specified in the Schedule of Requirements, and upon fulfillment of any and all additional conditions specified in the SCC.
- (t) “The Project Manager” means the duly authorized Purchaser’s representative named in SCC, who shall manage and be responsible for fulfillment of the Purchaser’s obligations, pursuant to GCC Clause 37, and shall oversee the Supplier’s performance of the Contract.
- (u) “The Supplier’s Representative” means the duly authorized representative of the Supplier, approved by the Purchaser to manage and be responsible for the Supplier’s performance under the Contract in accordance with GCC Clause 38.
- (v) “The Project Plan” means the document to be developed by the Supplier and approved by the Purchaser, pursuant to GCC Clauses 18 and 38, based on the requirements of the Contract and the preliminary project plan included in the Supplier’s bid. Should the Project Plan conflict with Contract in any way, the relevant provisions of the Contract shall prevail in each and every instance.
- (w) “Installation” means the Supplier’s written notification that the Systems (or a specific part thereof) have been installed by the Supplier in accordance with Contract requirements and the Project Plan, and are ready for Acceptance testing.

- (x) “Acceptance” means the Purchaser’s written certification that, following Installation the Systems (or a specific part thereof) have been tested and verified as complete and/or fully operational, in accordance with the Acceptance tests defined in the Contract and Project Plan.
- (y) “The Warranty Period” is the period specified in the GCC or SCC, following Acceptance of the Systems, during which the Supplier’s Warranty obligations in respect of the Systems are in force, pursuant to GCC Clause 34.
- (z) “The Maintenance Period” is the number of years specified in SCC for maintenance and support Services for the Systems under this Contract, as measured from the expiration of the Warranty Period, and is used for evaluating the bids.
- (aa) “The Coverage Period” is the days of the week and the hours on those days during which maintenance, operational and/or technical support services must be available, as specified in SCC, and is used to enable Suppliers to identify costs.
- (ab) “Intellectual Property Rights” means any and all copyright, moral rights, trademark, patent, and other intellectual and proprietary rights, title and interests, world-wide, whether vested, contingent or future, including without limitation all economic rights and all exclusive rights to reproduce, fix, adapt, modify, translate, create, derivative works from, manufacture, introduce into circulation, publish, distribute, sell, license, sublicense, transfer, rent, lease, transmit or provide access electronically, broadcast, display, enter into computer memory, or otherwise use any portion or copy, in whole or in part, in any form, directly or indirectly, or to authorize or assign others to do so.
- (ac) “Day” means calendar day.
- (ad) “Procurement Guidelines” refers to the latest edition of the World Bank Guidelines: Procurement under IRBD Loans and IDA Credits, January 1995 (revised January & August 1996 (hereinafter referred to as the IRBD Guidelines for procurement)).

## **2 Application**

- 2.1 These General Conditions shall apply to the extent that they are not superseded by provisions of other parts of the Contract.

## **3 Country of Origin**

- 3.1 All Products and Services supplied under the Contract shall have their origin in the countries and territories eligible under IRBD Guidelines for Procurement of the World Bank.

- 3.2 For purposes of this Clause, “origin” means the place where the Products were produced or from which the Services are supplied. Products are produced when, through manufacturing, processing, software development or substantial and major assembly or integration of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components. The origin of Products and Services is distinct from the nationality of the Supplier.

## **4 Standards**

- 4.1 The Systems supplied under this Contract shall conform to the standards mentioned in the Technical Specifications, and, when no applicable standard is mentioned, to the authoritative standards appropriate to the Systems’ country of origin. Such standards shall be the latest issued by the relevant organization.

## **5 Contract Amendments**

- 5.1 Subject to GCC Clause 36, no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

## **6 Joint Ventures**

- 6.1 If the Supplier is a joint venture, all members of a joint venture shall be jointly and severally liable for the fulfillment of the Contract and shall designate one of the firms to act as the leader. The constitution of the joint venture shall not be altered without the prior written consent of the Purchaser.

## **7 Assignment**

- 7.1 The Supplier shall notify the Purchaser in writing of its intent to award subcontracts not already specified in the Bid, or change subcontractors under this Contract. Such awards and changes must comply with GCC Clause 3 and shall require the Purchaser’s written consent prior to execution thereof. Such notification, and the Purchaser’s consent or objection thereto, shall not relieve the Supplier from any liability or obligation under the Contract. The Supplier shall not assign, in whole or in part, its obligations to perform or right to receive payments under this Contract, except with the Purchaser’s prior written consent.

## **8 Resolution of Disputes**

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

third party, adjudication in an agreed national or international forum, and/or international arbitration.

## **9 Governing Language**

9.1 The Contract shall be written in the language specified in SCC. Subject to GCC Clause 10, the version of the Contract written in the specified language shall govern its interpretation. All correspondence and other documents pertaining to the Contract which are exchanged by the parties shall be written in the same language.

## **10 Applicable Law**

10.1 The Contract shall be interpreted in accordance with the laws of the Purchaser's country, unless otherwise specified in SCC.

## **11 Notices**

11.1 Any notice given by one party to the other pursuant to this Contract shall be sent to the other party in writing or by cable, telex, or facsimile and confirmed in writing to the other party's address specified in SCC.

11.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

## **12 Supplier's Bid**

12.1 The Supplier's Bid shall form part of the Contract.

## **13 Secondary Contractual Agreements**

13.1 Any additional contractual or liability agreements may be attached to the Special Conditions of Contract by mutual, written agreement of the Purchaser and the Supplier. If there is any conflict with the GCC or SCC Clauses or the Technical Specifications, the GCC/SCC Clause shall prevail in each and every instance.

## **B. Confidentiality and Property Rights**

### **14 Use of Contract Documents and Information; Inspection and Audit by the Bank**

- 14.1 The Supplier shall not, without the Purchaser's prior written consent, disclose the Contract, or any provision thereof, or any specification or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.
- 14.2 Any document, other than the Contract itself, enumerated in GCC Clause 14.1 shall remain the property of the Purchaser and all copies thereof shall be returned to the Purchaser on termination of the Contract, if so required by the Purchaser.
- 14.3 The Supplier shall not, without the Purchaser's prior written consent, make use of any document or information enumerated in GCC Clause 14.1 except for purpose of performing the Contract.
- 14.4 The Purchaser shall not, without the Supplier's prior written consent, disclose any documents, data or other information furnished by the Supplier in connection with the Contract, and clearly identified in advance by the Supplier as being confidential, to parties not directly involved in the project(s) covered by the Contract, pursuant to GCC Clause 14.5
- 14.5 The provisions of GCC Clause 14 shall survive termination of the Contract for a period of one year thereafter, and shall not apply to information which:
- (a) now or hereafter enters the public domain through no fault of that party;
  - (b) can be proven to have been in possession of that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party hereto; or
  - (c) otherwise lawfully becomes available to that party from a third party under no obligation of confidentiality.
- 14.6 The Supplier shall permit the Bank to inspect the Supplier's accounts and records relating to the performance of the supplier and to have them audited by auditors appointed by the Bank, if so required by the Bank.

### **15 Indemnification**

- 15.1 The Supplier shall, at its own expense, defend and indemnify the Purchaser against all third-party claims of infringement of Intellectual Property Rights, including patent, trademark, copyright, trade secret or industrial design rights arising from use of the Products or any part thereof in the Purchaser's country.



- 15.2 The Supplier shall expeditiously extinguish any such claims and shall have full rights to defend itself therefrom. If the Purchaser is required to pay compensation to a third party resulting from such infringement, the Supplier shall be fully responsible therefor, including all expenses and court and legal fees.
- 15.3 The Purchaser will give notice to the Supplier of any such claim without delay, shall provide reasonable assistance to the Supplier in disposing of the claim, and shall at no time admit to any liability for or express any intent to settle the claim.
- 15.4 Indemnities shall not apply if any claim of infringement or misappropriation:
- (a) is asserted by a parent, subsidiary or affiliate of the Purchaser's organization;
  - (b) is a direct result of a design mandated by the Purchaser's Technical Specifications and the possibility of such infringement was duly noted in the Supplier's Bid; or
  - (c) results from the Purchaser's alteration of the Products.
- 15.5 The Purchaser shall indemnify and defend the Supplier against all third-party claims of infringement of Intellectual Property Rights, including patent, trademark, copyright, trade secret or industrial design rights arising from the use of any information or Software provided to the Supplier by the Purchaser under the Contract.

## **16 Software License Agreements**

- 16.1 The Supplier hereby grants to Purchaser a fully paid-up, irrevocable, non-exclusive license throughout the territory of the Purchaser's Country to access and use the Standard and Application Software, including all inventions, designs and marks embodied therein, which Software may be:
- (a) used or copied for use or with the primary computer for which it was acquired, plus a backup computer if the primary is inoperative;
  - (b) reproduced for safekeeping or backup purposes;
  - (c) customized, adapted, or combined with other computer software, provided that derivative software incorporating any of the delivered, restricted computer software shall be subject to same restrictions set forth herein;
  - (d) disclosed to and reproduced for use by support service suppliers or their subcontractors, subject to the same restrictions set forth in this Contract;
  - (e) used or copied for use on or transferred to a replacement computer.

- (f) subject to audit by the Supplier to verify compliance with these License Agreements.
  
- 16.2 The copyright in all documents, Standard Software and other materials containing data and information furnished to the Purchaser by the Supplier shall remain vested in the Supplier or, if they are furnished to the Purchaser by any third party including subcontractors and original producers of Products furnished by the Supplier under the Contract, the copyright in such materials shall remain vested in such third party.
  
- 16.3 The Purchaser agrees to restrict use, copying or duplication of Software and related documentation in accordance with GCC Clause 16.1 and 16.2 except that additional copies of documentation may be made by the Purchaser for use within the scope of the project for which this Contract was issued, in the event that the Supplier is unable to deliver copies within 30 days from receipt of an order.
  
- 16.4 The Purchaser's contractual rights to use the Software may not be assigned, licensed, or otherwise transferred voluntarily without the Supplier's prior written consent.

## **C. Payments, Guarantees and Liabilities**

### **17 Performance Security**

- 17.1 Within thirty (30) days of receipt of the notification of Contract award, the successful Bidder shall furnish to the Purchaser the performance security in the amount specified in SCC.
- 17.2 The proceeds of the performance security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract. The Purchaser shall notify the Supplier in writing of its invocation of its right to receive such compensation within 7 days, indicating the contractual obligation(s) for which the Supplier is in default.
- 17.3 The performance security shall be denominated in the currency of the Contract, or in a freely convertible currency acceptable to the Purchaser and shall be in one of the following forms:
- (a) a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the Purchaser's country or abroad, acceptable to the Purchaser, in the form provided in the Bidding Documents or another form acceptable to the Purchaser; or
  - (b) a cashier's or certified cheque.
- 17.4 The performance security will be discharged by the Purchaser and returned to the Supplier not later than thirty (30) days following the date of written acceptance of all the supplier's performance obligations under the Contract, as specified in SCC.
- 17.5 GCC Clause 17 shall not be invoked if the contractual default condition has been referred for dispute resolution under the provision of GCC Clause 8.

### **18 Payment**

- 18.1 The method and conditions of payment to be made to the Supplier under this Contract shall be specified in SCC.
- 18.2 The Supplier's request(s) for payment shall be made to the Purchaser in writing, accompanied by an invoice describing, as appropriate, the Systems delivered, installed and accepted, and by documents submitted pursuant to GCC Clause 29, and upon fulfillment of other obligations stipulated in the Contract.
- 18.3 Payments shall be made promptly by the Purchaser, but in no case later than sixty (60) days after submission of valid invoice or claim by the Supplier.

- 18.4 The currency or currencies in which payment is made to the Supplier under this Contract shall be specified in SCC, subject to the principle that payment for imported Products will be made in the currency or currencies in which the payment has been requested in the Supplier's bid.
- 18.5 Payment of the foreign currency portion of the Contract Price for imported Products and Services shall be made to the Supplier through an irrevocable letter of credit opened by an authorized bank in the Supplier's country, and will be payable on presentation to it of the appropriate documents. It is agreed that the letter of credit will be subject to Article 10 of the last revision of *Uniform Customs and Practice for Documentary Credits*, published by the International Chamber of Commerce, Paris.

## **19 Prices**

- 19.1 Prices charged by the Supplier for Systems installed and Services performed under the Contract shall not be increased from the prices quoted by the Supplier in its bid, with the exception of any price adjustments authorized in GCC Clause 36, SCC or in the Purchaser's request for bid validity extension.

## **20 Taxes and Duties**

- 20.1 A foreign Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the Purchaser's country.
- 20.2 A local supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the Products and Services to the Purchaser.
- 20.3 Furthermore, both foreign and local Suppliers are responsible for any taxes levied in connection with performance of Services described in the SCC. If any rate of tax is increased or decreased fourteen (14) days prior to the deadline for submission of bids, the same shall be compensated to, or deducted from, payments due to the Supplier as the case maybe.

## **21 Delays in the Supplier's Performance**

- 21.1 Delivery and Installation of the Systems and Services shall be made by the Supplier in accordance with the time schedule prescribed by the Purchaser in the Schedule of Requirements.
- 21.2 If at any time during performance of the Contract, the Supplier or its subcontractor(s) should encounter conditions impeding timely delivery or installation of the Systems or performance of Services, the Supplier shall promptly notify the Purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, with or without liquidated damages, in which case the extension shall be ratified by the parties by amendment of the Contract.

- 21.3 Except as provided under GCC Clause 26, a delay by the Supplier in the performance of its delivery or installation obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 22, unless an extension of time is agreed upon pursuant to GCC Clause 21.2 or 36 without the application of liquidated damages.

## **22 Liquidated Damages**

- 22.1 Subject to GCC Clause 26, if the Supplier fails to deliver or install any or all of the Systems or any of the Systems fail to gain Acceptance within the period(s) specified in the Contract, the Purchaser shall, without prejudice to its other remedies under the Contract, deduct from the Performance Security, as liquidated damages, a sum equivalent to the percentage of the Contract price specified in SCC for each week or part thereof of delay until successful acceptance, up to a maximum deduction of the percentage specified in SCC, subject to the provisions of Clause 22.2. Once the maximum is reached, the Purchaser may consider termination of the Contract pursuant to GCC Clause 23.
- 22.2 If delivered or installed Products and/or Services cannot be put to use without the uninstalled Products or undelivered Services, the damages will be calculated using the total price of the Systems that cannot be put to use.

## **23 Termination for Default**

- 23.1 The Purchaser, without prejudice to any other remedy for breach of Contract, by thirty (30) days advance written notice of default sent to the Supplier, may terminate this Contract in whole or in part:
- (a) if the Supplier fails to deliver any or all of Products or to install any or all of the Systems within the period(s) specified in the Contract, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 21; or
  - (b) if the Supplier fails to perform any other significant obligation(s) under the Contract.
  - (c) If the Supplier, in the judgment of the Purchaser has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.

For purpose of this clause:

“corrupt practice” means the offering, giving, receiving or soliciting of any thing of value to influence the action of a public official in the procurement process or in contract execution.

“Fraudulent practice” means a misrepresentation of facts in order to influence o procurement process or the execution of a contract to the detriment of the Borrower, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Borrower of the benefits of free and open competition.

- 23.2 In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 23.1, the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Products similar to those uninstalled or Services similar to those undelivered, and the Supplier shall be liable to the Purchaser for any excess costs for those similar Products or Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

## **24 Termination for Insolvency**

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

## **25 Termination for Convenience**

- 25.1 The Purchaser may, by 60 days advance written notice sent to the Supplier, terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.
- 25.2 The Products that are complete and ready for shipment within thirty (30) days after the Supplier's receipt of notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining terminated Products and Services, the Purchaser may elect:
- (a) to have any portion completed and delivered under mutually agreed terms and prices; and/or
  - (b) to cancel the remainder and pay the Supplier an agreed amount for Products and Services partially completed or already procured.
- 25.3 The Purchaser shall not unreasonably terminate the Contract in part if such termination would result in the Supplier being unable to complete the remaining contractual obligations. The Purchaser shall also not terminate the Contract in part if the non-performance is due to the inability of the Purchaser to fulfill its contractual obligations.

## **26 Force Majeure**

- 26.1 Notwithstanding the provisions of GCC Clause 21,22, and 23, the Supplier shall not be liable for forfeiture of its performance security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

- 26.2 For purposes of this clause, “Force Majeure” means an event beyond the control of the Supplier and not involving the Supplier’s fault or negligence and not foreseeable. Such events may include, but not restricted to, acts of the Purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.
- 26.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.
- 26.4 If the Supplier has made all reasonable efforts to obtain the required export permit(s), including the exercise of due diligence in determining the eligibility of the Systems for receipt of the necessary export permits, but has failed, this shall be considered a Force Majeure situation.
- 26.5 If an event of Force Majeure, other than as covered under GCC Clause 26.4, continues for a period of one hundred and eighty (180) days or more, the parties may by mutual agreement, terminate the Contract without either party incurring any further liabilities towards the other with respect to the Contract, other than to effect payment for Products already delivered or Services already performed.

## **27 Limitation of Liability**

- 27.1 Except in cases of criminal negligence or willful misconduct:
- (a) the Supplier shall not be liable to the Purchaser, whether in the Contract or otherwise, for any indirect or consequential loss or damage, provided this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Purchaser; and
  - (b) the aggregate liability of the Supplier to the Purchaser under the Contract shall not exceed the total Contract Price, provided that this limitation shall not apply to any obligation of the Supplier to indemnify the Purchaser with respect to patent infringement.

## **D. Contract Execution**

### **28 Packing**

28.1 The Supplier shall provide such packing of the Products as is required to prevent their damage or deterioration during the shipment. The Supplier shall promptly repair or replace any Products that are damaged in transit due to inadequate packing or related causes, where such damage is not otherwise fully covered by insurance. The packing, marking, and documentation within and outside the package shall also comply strictly with the requirements therefor in SCC.

### **29 Delivery and Documents**

29.1 Delivery, Installation and Acceptance of the Systems shall be made by the Supplier in accordance with the schedule and at the Project Sites specified in the Schedule of Requirements, which forms an integral part of the Contract.

29.2 For purposes of the Contract, “EXW, CIP, DAF” and other trade terms used to describe the obligations of the parties shall have the meanings assigned to them by the current edition of Incoterms, published by the International Chamber of Commerce, Paris.

29.3 Early or partial deliveries require the explicit written consent of the Purchaser, which consent shall not be unreasonably withheld.

29.4 For Products supplied from abroad (CIP or DAF Terms): Upon shipment, the Supplier shall notify the Purchaser and the Insurance Company by cable with the full details of the shipment, etc. The Supplier shall promptly send the following documents to the Purchaser by mail or courier, as appropriate, with a copy to the Insurance Company:

- (a) two copies of the Supplier’s invoice showing the Products’ description, quantity, unit price, and total amount;
- (b) usual transportation documents;
- (c) insurance certificate for CIP only; and
- (d) certificate(s) of origin.



- 29.5 For Products from within the Purchaser's country (EXW Terms): Upon shipment, the Supplier shall notify the Purchaser and shall promptly send the following documents to the Purchaser by mail or courier, as appropriate:
- (a) two copies of the Supplier's invoice showing the Products' description, quantity, unit price, and total amount;
  - (b) delivery note, railway receipt, or truck receipt; and
  - (c) certificate(s) of origin.
- 29.6 The documents listed in GCC Clause 29.4 or 29.5, as appropriate, shall be received by the Purchaser at least one week before arrival of the Products at the point of entry or delivery destination, as appropriate, and if not received on time, the Supplier will be responsible for any consequent expenses.

### **30 Insurance**

- 30.1 The Products supplied under the Contract shall be fully insured to 110% of their CIP or DAF or EXW value from shipment until receipt at their final destination on an "all risks" basis, in a freely convertible currency, against loss or damage incidental to production or acquisition, transportation, storage, and delivery. The Supplier shall arrange and pay or otherwise provide for this insurance, which shall name the Purchaser as beneficiary. Furthermore, if specified in the SCC, the Supplier shall also be responsible for insurance coverage till the successful Acceptance of the Products.

### **31 Transportation**

- 31.1 Transportation of the Products, including insurance and storage, to the point of entry or the named place of destination in the Purchaser's country, as specified in the Contract, shall be arranged and paid for by the Supplier, and the cost thereof shall be included in the Contract Price.
- 31.2 Transportation of Products from the delivery destination to the place(s) of final installation, if different, shall be the responsibility of the Purchaser unless otherwise specified in the SCC.

### **32 Implementation Services**

- 32.1 The Supplier shall provide all Services specified in SCC and the Technical Specifications in accordance with the highest standard of professional competence and integrity. The Purchaser reserves the right to require the replacement of any Supplier staff assigned to work on the Purchaser's site by suitably qualified staff, in the event that the staff concerned is determined to be incompetent or loses the confidence of the Purchase.
- 32.2 Prices charged by the Supplier for Services, if not included in the Contract, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged by the Supplier to other purchasers in the Purchaser's country for similar services.

### **33 Inspections and Acceptance Tests**

- 33.1 The Purchaser or its representative shall have the right to inspect and/or test the Systems to confirm their conformity to the Contract specifications at point of delivery and or at the final place(s) of Installation at no extra cost to the Purchaser.
- 33.2 Should any inspected or tested Systems fail to conform to the Contract specifications or to pass the acceptance tests as defined jointly in the Project Plan, the Purchaser may reject the Systems, and the Supplier shall either replace the rejected System or make alterations as necessary to meet the specifications free of cost to the Purchaser.
- 33.3 Acceptance of the Systems (or part thereof) shall be made at the Installation sites specified in the Schedule of requirements. At the Purchaser's discretion, acceptance tests will also be performed on replacement products, upgrades and new versions releases, and products which are added or field-modified after Acceptance of the Systems.
- 33.4 The Purchaser will develop and execute Acceptance test programs, procedures and data, with all necessary and proper cooperation from the Supplier, pursuant to GCC Clause 38. The Purchaser shall provide the necessary input to the development of the Acceptance testing portion of the Project Plan, pursuant to GCC Clause 37 and 38, within the number of days from the Effective Date of the Contract specified in SCC. Acceptance tests and success criteria will be defined to substantiate the standard of performance stipulated in the Supplier's bid.
- 33.5 Acceptance testing of Systems shall commence within 30 days from the date of Installation. Production use of Systems shall not commence prior to the start of formal Acceptance testing. Production use of a System for 60 consecutive days shall constitute Acceptance, and shall be so documented by the Supplier. The Purchaser shall certify its Acceptance of the System within 14 days thereafter.
- 33.6 Nothing in GCC Clause 33 shall in any way release the Supplier from any warranty or other obligations under this Contract or limit the Purchaser's ability to seek other remedies as specified in the Contract.

### **34 Warranty**

- 34.1 The Supplier warrants that the Systems supplied under the Contract are new, unused, of the latest appropriate design, and that they incorporate all recent improvements in design and materials. The Supplier also warrants that all the Products form part of the producers' current product lines, have been previously released to the market, and all non-custom software products have been in production use for at least three months. The Supplier further warrants, for the duration of the twelve month (12) Warranty Period commencing from the date of acceptance of each product, that all Systems supplied under this Contract shall have no defect arising from design or workmanship (except when design is defined by the Purchaser's specifications and the defect was duly noted in the Supplier's bid) or from any act or omission of the Supplier,

that may develop under normal use of the supplied Systems in the conditions prevailing in the Purchaser's country. Normal operating environmental conditions are specified in the Contract. This warranty exclude defects attributable to external factors beyond the Supplier's control, including power supply fluctuations, or the Purchaser's alterations, misuse or negligence in proper maintenance of the Systems.

- 34.2 The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall, within the warranty period and with all reasonable speed, repair or replace the defective Systems, without costs to the Purchaser other than, where applicable, the cost of inland delivery of the repaired or replaced Systems from EXW or the CIP or DAF point of entry to the Installation site. Replacement equipment shall be covered under warranty for three month period, or the time remaining in the Warranty Period for the item replaced, whichever is greater. The Warranty Period for replacement Software shall be incidental to the initial warranty period for the defective Software unless otherwise specified in the SCC. The replaced Products shall be the property of the Supplier.
- 34.3 If the Supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, the Purchaser may proceed to take such reasonable remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.
- 34.4 During the Warranty Period, the Supplier will provide at no additional cost to the Purchaser all Product and documentation updates and new software versions releases within 30 days of their availability in the Purchaser's country, and no later than 12 month after they are released in the country of origin of the Product.
- 34.5 The Supplier hereby represents and warrants that the Software as delivered does not and will not infringe any Intellectual Property Rights held by any third party and that it has all necessary rights, or at its sole expense shall have secured in writing all transfers of rights and other consents necessary to make the assignments, licenses and other transfers of Intellectual Property Rights and the warranties set forth in the Contract, and for the Purchaser exclusively to own or exercise all Intellectual Property Rights as provided in the Contract. Without limitation, the Supplier shall secure all necessary written agreements, consents and transfers of rights from its employees and other persons or entities whose services are used for development of the Software.
- 34.6 Without prejudice to the warranties given for individual Products or Services, the Supplier hereby warrants to the Purchaser that:
  - (a) the Systems represent a complete, integrated solution to the Purchaser's requirements as set forth in the Technical Specifications and will provide the functionality and the performance set forth therein. The Supplier shall accept responsibility for the successful interoperation and integration in accordance with the requirements of the Technical Specifications, of all Products provided under the Contract;

- (b) the Systems' specifications, capabilities and performance characteristics are as stated in the Supplier's Bid and Product documentation;
- (c) all modifications to the Products will be at a minimum uniform with those given to other users in the Purchaser's country, except for those designed specifically to fulfill the Purchaser's requirements.
- (d) the Supplier will offer all possible assistance to the Purchaser to seek warranty services or remedial action from subcontracted third party producers or licensors of Products included in the Systems. The Supplier will make all reasonable and necessary efforts to correct defects in the Systems that constitute significant deviations from the Technical Specifications and/or Supplier performance claims.

### **35 Product Support**

- 35.1 For Products still to be delivered, the Supplier will offer to the Purchaser newer versions based on latest appropriate technology and having equal or better performance or functionality at the same or lesser unit prices, cost reductions, support and facilities which are offered to other clients of the Supplier, pursuant to GCC Clause 36.1.
- 35.2 The Supplier shall provide new Software version releases and documentation within 30 days of their availability in the Purchaser's country and no later than 12 months after they are released in the country of origin of the Product, and technical support Services if so specified in SCC. In no case will the price or yearly percentage price increases for these Products and Services exceed those quoted by the Supplier in the Recurrent Costs Form in its bid.
- 35.3 The Purchaser shall implement software updates and new version releases within 18 month of receipt of a production-ready copy thereof, provided that the new release does not adversely affect Systems' operation or performance, or require extensive reworking of the Systems. In case where the new version release adversely affects the Systems performance, the period for implementation of the new version shall be suitably extended and the Supplier shall continue to support and maintain the version currently in production for as long as necessary to properly implement the new version. In no case shall the Supplier cease to support or maintain a version of software less than 24 months from the date the Purchaser receives a production-ready copy of a subsequent version.

### **36 Change Orders**

- 36.1 The Purchaser may at any time, by a written order given to the Supplier pursuant to GCC Clause 11, make changes within the general scope of the Contract in any one or more of the following:
  - (a) designs or specifications for Services for Systems that are to be integrated, developed or customized specifically for the Purchaser;

- (b) the method of shipment and/or schedule for and/or place of delivery;
  - (c) the schedule for Installation or Acceptance;
  - (d) the Services to be provided by the Supplier; and/or
  - (e) the substitution of new products and services from the Supplier. When such substitution is requested by the supplier, the Purchaser shall notify the Supplier in writing within 30 days of its decision to accept or reject the proposed Change Order.
- 36.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this clause must be asserted within thirty (30) days from the date of the Supplier's receipt of the Purchaser's change order. If the parties cannot agree on an equitable adjustment, the Change Order will not be implemented. However this provision does not limit the right of either party under GCC Clause 8.
- 36.3 The parties will agree during development of the Project Plan to a time period prior to the schedule date for Acceptance, after which all specifications shall be frozen. Any Change Order generated after this time will be dealt with after Acceptance.

## **37 Purchaser's Obligations**

- 37.1 The Purchaser will appoint a Project Manager (and a deputy as the case may be) responsible for managing the project, with the authority to accept or reject all deliverables and to be the primary contact for the Supplier's Representative. The Project Manager will officially record all delays and problems, and forward them to the Supplier within two weeks of discovery of such problems.
- 37.2 The Purchaser shall be responsible for timely provision of all resources, facilities, equipment access, and information necessary for the completion of the project implementation, as identified in the agreed and finalized Project Plan, except where provision thereof is explicitly identified in the Contract as being the responsibility of the Supplier. Delay by the Purchaser may result in an appropriate extension of the project Installation and/or Acceptance schedule, at the Supplier's discretion.
- 37.3 The Purchaser will designate appropriate staff for the training courses to be given by the Supplier, and shall make all appropriate logistical arrangements therefor in accordance with the Project Plan.
- 37.4 The Purchaser is responsible for performing and safely storing timely and regular backups of its data and Software in accordance with accepted data management principles, except where such responsibility is clearly assigned to the Supplier elsewhere in the Contract.

## **38 Supplier Obligations**

- 38.1 The Supplier will abide by the job safety, insurance, customs and immigration measures prevalent and laws in force in the Purchaser's country, and will indemnify the Purchaser from all demands or responsibilities arising from accidents or loss of life, the cause of which is the Supplier's negligence. The Supplier will pay all indemnities arising from such incidents and will not hold the Purchaser responsible or obligated.
- 38.2 The Supplier is responsible for, and obligated to conduct all contracted activities with due care and diligence, in accordance with the Contract and using state-of-the-art methods and economic principles, and exercising all reasonable means to achieve the performance specified in the Contract.
- 38.3 The Supplier is obliged to work closely with the Purchaser's Project Manager and staff, act within its own authority, and abide by directives issued by the Purchaser that are consistent with the terms of the Contract. The Supplier is responsible for managing the activities of its personnel and any sub-contracted personnel, and will hold itself responsible for any misdemeanors.
- 38.4 The Supplier shall appoint an experienced Representative to manage its performance of the Contract within 30 days from Contract signature. The Representative shall be authorized to accept orders and notices on behalf of the Supplier, and to generate notices and commit the Supplier to specific courses of action within the scope of the Contract. The Representative may be replaced only with prior written consent of the Purchaser.
- 38.5 The Supplier shall develop the final Project Plan based on Contract requirements and time table, to be submitted to the Purchaser for review and approval within the number of days specified in SCC from the Effective Date of the Contract, with all reasonable and necessary input from the Purchaser pursuant to GCC Clause 37.
- 38.6 The Supplier shall complete Delivery, Installation and Acceptance of the Systems in accordance with the Contract requirements (as may be further elaborated in SCC and the Project Plan), or such schedule and specification changes as the Supplier may be entitled to, pursuant to GCC Clause 36.

## **Section V**

# **Special Conditions of Contract**

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### SECTION V SPECIAL CONDITIONS OF CONTRACT

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The following Special Conditions of Contract shall supplement or amend the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract. The corresponding GCC clause number is indicated in parentheses.

## **A. Common Conditions**

### **1 Definitions (GCC Clause 1)**

GCC 1.1 (b) - Contract Price. The Products and Services identified in the Recurrent Costs Form in the Supplier's bid are included in the Contract Price in their entirety. The maintenance period is three (3) years after warranty period and all services described in Section VI - Schedule of Requirements under Recurrent Costs are to be performed.

GCC 1.1 (f) - The Purchaser is: Consignees indicated in the Consignee Statement attached to Section VI – Schedule of Requirements.

GCC 1.1 (g) - The Purchaser's country is: India

GCC 1.1 (h) - The supplier is: *[name]*

In case of a bid submitted by a joint venture of two or more firms as Partners, the "Supplier" is the Partner assuming overall responsibility for the Contract and designated the "Partner in Charge".

"Partners" are all parties to a joint venture agreement(s) with the Supplier, whereby the parties thereto are jointly and severally liable for performance of the Contract, and the duly authorized Partner in Charge may bind, incur liabilities and receive instructions for and on behalf of all Partners. Changes in partnership agreement(s) must comply with GCC Clause 3 and shall require the Purchaser's written consent prior to execution thereof. Such notification, and the Purchaser's consent or objection thereto, shall not relieve the Supplier from any liability or obligation under the Contract.

The Partners are:      1) \_\_\_\_\_  
   2) \_\_\_\_\_  
   3) \_\_\_\_\_

GCC 1.1 (t) - The Purchaser's Project Manager is: The Consignee indicated in the Consignee Statement attached to Section VI – Schedule of Requirements.

GCC 1.1 (y) - The Warranty Period is: Twelve (12) months from the date of Acceptance of the Systems.

GCC 1.1 (z) - The Maintenance Period is: Three (3) years following the expiration of the Warranty period.

GCC 1.1 (aa) - The Coverage Period is: six (6) days per week (on working days), from 09.00 hrs. (IST) to 18.00 hrs. (IST)

## **2 Resolution of Disputes (GCC Clause 8)**

GCC 8.3 – The dispute resolution mechanism to be applied pursuant to GCC Clause 8.2 shall be as follows:

- (a) In the case of a dispute or difference arising between the Purchaser and a Domestic Supplier relating to any matter arising out of or connected with this agreement, such dispute or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 arbitrators one each to be appointed by the Purchaser and the Supplier. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as Presiding Arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the President of the Institution of Engineers (India).
- (b) In the case of a dispute with a Foreign Supplier, the dispute shall be settled in accordance with the provisions of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules. The Arbitral Tribunal shall consist of 3 Arbitrators one each to be appointed by the Purchaser and the Supplier. The third Arbitrator shall be chosen by the two arbitrators so appointed by the Parties and shall act as Presiding Arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding Arbitrator shall be appointed by the President of the Institution of Engineer (India)”
- (c) If one of the parties fails to appoint its arbitrator in pursuance of sub-clause (a) and (b) above, within 30 days after receipt of the notice of the appointment of its arbitrator by the other party, then the Presiding Arbitrator shall be nominated by President of the Institution of Engineers (India), both in cases of the Foreign Supplier as well as Indian Supplier who shall appoint the arbitrator. A certified copy of the order of the President of the Institution of Engineers (India), making such an appointment shall be furnished to each of the parties.
- (d) Arbitration proceedings shall be held at New Delhi, India, and the language of the arbitration proceedings and that of all the documents between the parties shall be English.

- (e) The decision of the majority of arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself.
- (f) Where the value of the contract is Rs.10 million and below, the disputes or differences arising shall be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority namely the President of the Institution of Engineers (India).

### **3 Governing Language (GCC Clause 9)**

GCC 9.1 - The Governing Language for all communications and technical documentation shall be: English

### **4 Notices (GCC Clause 11)**

GCC 11.1 - Purchaser's address for notice purposes are the address indicated in the Consignee Statement attached to Section VI – Schedule of Requirements.

Supplier's Address:

### **5 Performance Security (GCC Clause 17)**

GCC 17.1 - The initial amount of performance security shall be as follows: Ten (10) percent of the total Bid Price, excluding Recurrent Costs. After Acceptance of the Bathymetric Systems in their entirety, the Performance Security shall be reduced to six (6 ) percent of the Bid Price for the duration of the Warranty Period, to cover the Supplier's warranty obligations pursuant to GCC Clause 34.

GCC 17.4 – The Performance Security will be discharged by the Purchaser and returned to the Supplier not later than sixty (60) days following the date of completion of the Supplier's performance obligations, including any warranty obligations, under the contract and following receipt of a performance guarantee of ten (10) percent contract value for the Recurrent Costs (as indicated in the Recurrent Costs Form including the maximum annual percentage price increases quoted therein) valid for thirty eight (38) months from the date of completion of the warranty period.

GCC 17.6 - Add as Clause 17.6 to the GCC in the following:

In the event of any contract amendment, the Supplier shall within 21 days of receipt of such amendment, furnish the amendment to the Performance Security, rendering the same valid for the duration of the Contract, as amended for further period of 60 days thereafter.

In the event of any correction of defects or replacement of defective equipment during the implementation and warranty period, the warranty for the corrected/replaced equipment shall be extended to a further period of 12 months. The performance guarantee for a proportionate value shall be extended 60 days over and above the extended warranty period.

## **6 Payment (GCC Clause 18)**

- 6.1 Payments will be made by the respective consignees indicated in Section VI – Schedule of Requirements.
- 6.2 The payment schedule to be observed in paying the Supplier for the Bathymetric Systems, except for Recurrent Costs during the Maintenance Period, is as follows: Payment will be made by the Project Manager of each state agency within 30 days of submission of valid claims and/or invoices.
  - (a) Products including Application Software. Payments will be made on a pro-rata basis at sixty (60) percent of the Contract Price exclusive of all Recurrent Costs therefore against delivery of the System and twenty (20) percent of the Contract Price therefor against Acceptance of the Product (s) and installation of the System on the boats.
  - (b) Complete System Integration. Twenty (20) percent of the Contract Price, exclusive of all Recurrent Costs, as final payment against Acceptance of the Bathymetry Systems as a complete, integrated system.
- 6.3 The payment schedule to be observed in paying the Supplier for Recurrent Costs during the Maintenance Period, is as follows: Payment will be made by the Project Manager of each state agency within 30 days of submission of valid claims and/or invoices.
  - (a) Products and Spare Parts : 80% of the Recurrent Costs therefor against shipping documents in accordance with GCC Clause 29. 20% of the Recurrent Costs therefor against Acceptance of the products.
  - (b) Services : 100% paid monthly in arrears, on submission and Purchaser's approval of invoices and on receipt of Bank Guarantee for ten (10) percent of the total Recurrent Costs valid for thirty eight (38) months from the date of completion of the Warranty period.

- (c) Payment of Local Currency Portion including Agency Commission: Payment shall be made in Indian Rupees within thirty (30) days of submission of claim supported by a certificate from the Purchaser declaring that the Goods have been delivered and that all other contracted Services have been performed.

#### 6.4 Letter of Credit (LC)

- (a) Where payments are to be effected through Letter of Credit (LC), the same shall be subject to the latest Uniform Customs and Practice for documentary credit, of the International Chamber of Commerce;
- (b) The LC will be confirmed at Supplier's cost if requested specifically by the Supplier;
- (c) If LC is required to be extended/reinstated for reasons not attributable to the Purchaser, the charges thereof shall be to the Supplier's account;
- (d) For all the payments to be made, against Bank guarantees, the bank guarantee shall be issued by a Scheduled Indian Bank or a Foreign bank located in India in the format enclosed at Section VII. The guarantees issued by other banks should be confirmed by a scheduled Indian bank or a foreign bank operating in India;

### **7 Prices (GCC Clause 19)**

GCC 19.1 Prices payable to the Supplier as stated in the Contract shall be firm and not subject to adjustment during performance of the Contract

### **8 Taxes and Duties (GCC Clause 20)**

- 8.1 For goods supplied from outside the country, the Supplier will be entirely responsible for all taxes, stamp duties, license fees, etc., and other such levies imposed outside the Purchaser's country, as well as for the taxes and levies to be charged in connection with commissioning services performed in India, and the Purchaser shall pay all the customs duties and import taxes in consequence of the importation of the goods.
- 8.2 For goods supplied from inside the country, the Supplier will be entirely responsible for all taxes, duties, license fees, Octroi, road permit fees, etc. borne by them in connection with delivery of goods at site including taxes and levies to be charged in connection with local transportation and incidental services and commissioning.
- 8.3 Income/Corporate Taxes in India:
  - (a) The Supplier shall be liable to pay all corporate taxes and income tax that shall be levied according to the laws and regulations applicable from time to time in India and the price bid by the Supplier shall include all such taxes in the contract price.

- (b) Wherever the laws and regulations require deduction of such taxes at the source of payment, the Purchaser shall effect such deductions from the payment due to the Supplier. The remittance of amounts so deducted and issuance of certificate for such deductions shall be made by the Purchaser as per the laws and regulations in force. Nothing in the Contract, shall relieve the Supplier from his responsibility to pay any tax that may be levied in India on income and profits made by the Supplier in respect of this contract.
- (c) The Supplier's staff, personnel and labour will be liable to pay personal income taxes in India in respect of such of their salaries and wages as are chargeable under the laws and regulations for the time being in force, and the Supplier shall perform such duties in regard to such deductions thereof as may be imposed on him by such laws and regulations.

## **9 Liquidated Damages (GCC Clause 22)**

GCC 22.1 - Applicable rate: One-half (1/2) percent per week. Maximum deduction: 10 percent of contract price exclusive of all Recurrent Costs.

## **10 Delivery of Documents (GCC Clause 29)**

Replace GCC Clauses 29.4, 29.5 & 29.6 by the following:

- (a) For Goods supplied from abroad:

GCC 29.4 Within 24 hours of shipment, the Supplier shall notify the Purchaser i.e. each consignee and the Insurance Company by cable or telex or fax the full details of the shipment including Contract number, description of goods, quantity, the vessel, the bill of lading number and date, port of loading, date of shipment, port of discharge, etc.. The Supplier shall mail the following documents to the Purchaser, with a copy to the Insurance Company:

- (i) 4 copies of Supplier's invoice showing contract number, goods description, quantity, unit price and total amount;
- (ii) Original and 4 copies of the negotiable, clean, on-board bill of lading marked freight prepaid and 4 copies of non-negotiable bill of lading;
- (iii) 4 copies of packing list identifying contents of each package;
- (iv) Insurance certificate;
- (v) Manufacturer's/Supplier's warranty certificate;
- (vi) Inspection certificate issued by the nominated inspection agency, and the Supplier's factory inspection report; and
- (vii) Certificate of origin.

The above documents made separately for each set shall be received by the Purchaser, i.e. one consignee, at least one week before arrival of Goods at the port or place of arrival and, if not received, the Supplier will be responsible for any consequent expenses.

b) For Goods from within India:

GCC 29.5 Upon delivery of the goods to the transporter/consignee, the Supplier shall notify the Purchaser and mail the following documents to the Purchaser:

- (i) 4 Copies of the Supplier invoice showing contract number, goods description, quantity, unit price, total amount;
- (ii) Delivery note, Railway receipt or acknowledgment of receipt of goods from the Consignee;
- (iii) Insurance Certificate;
- (iv) Manufacturer's/Supplier's warranty certificate;
- (v) Inspection certificate issued by the nominated inspection agency, and the Supplier's factory inspection report; and
- (vi) Certificate of Origin.

GCC 29.6 The above documents made separately for each set shall be received by the Purchaser, i.e., each consignee at least one week before arrival of Goods (except at where it is handed over to the Consignee) and, if not received, the Supplier will be responsible for any consequent expenses.

## **11 Insurance (GCC Clause 30)**

GCC 30.1 The Insurance shall be in the amount equal to 110 percent of the CIF or CIP value of the Goods from "Warehouse to warehouse (final destination)" on "All Risks" basis including War Risks and Strikes, valid for a period not less than 3 months after installation and commissioning and issue of acceptance certificate by the Purchaser.

Add GCC Clause 30.2 as under:

GCC 30.2 Should any loss or damage occur, the Supplier shall:

- (a) Initiate and pursue claim till settlement, and
- (b) promptly make arrangements for repair and/or replacement of any damaged item(s) irrespective of settlement of claim by the underwriters.

## **B. Specific Conditions**

### **12 Ownership Rights for Custom Software and Documentation (GCC Clause 16)**

- 12.1 The Supplier hereby assigns and transfer to the Purchaser all Intellectual Property Rights in the Custom Software, including all writings, designs, algorithms and programming documentation made, conceived, reduced to practice authorized by the Supplier or its employees during performance of the Contract, or with information, materials or facilities furnished by the Purchaser. In the event that, by the operation of law, the Supplier is deemed to have retained rights in any portion of the Custom Software, the Supplier grants to the Purchaser an irrevocable world-wide license thereto.
- 12.2 The Supplier shall relinquish to the Purchaser the Custom Software Source Code within 15 days from the date of Implementation Period expiration.

### **13 Implementation and Support Services (GCC Clause 32 and 35)**

- 13.1 The Supplier shall provide Services for Installation, project planning and implementation, training and Acceptance Testing as required by the Contract for the prices quoted in its bid and included in the Contract Price, as follows:
  - (a) Performance of on-site Installation of the supplied Systems at all places of final installation and integration specified in the Schedule of Requirements. The Supplier is responsible for all unpacking, assembling, wiring, installation, cabling between equipment units and components, and connection to power supplies. The Supplier will test all System's operations and perform all the necessary setup, configuration and customization for successful operation of the Systems at the Installation sites, in accordance with Contract requirements;
  - (b) For each of the systems installed, the Supplier is required to train the designated Purchaser's technical and end-user staff, according to the Schedule of Requirements, to enable them to effectively manage and use the Systems, as specified in the Technical Specifications. The training and accompanying materials shall be provided in the language specified in SCC Clause 3. The Supplier shall provide a detailed operations and user's manual for each appropriate unit of the supplied Systems;
  - (c) On-site technical support and service obligations during the Coverage Period for Acceptance test support and for twelve months for on-site technical support from the date of System Acceptance at the Purchaser's Installation site(s), and as required by the Technical Specifications;



- (d) The Supplier shall obtain and deliver to the Purchaser, the permits/licences of the Telemetry Transmitter from the controlling authority as required for use of the DGPS and the voice communication link. The Documents shall be delivered with DGPS. The Purchaser, may help the Supplier in issue of necessary certificates/permits.
- (e) Other service obligations as required by the Contract, including: Acceptance testing obligations pursuant to GCC Clause 33 and SCC Clause 14, Project Planning obligations pursuant to GCC Clause 38 and SCC Clause 18, and as specified in the Technical Specifications;

13.2 The Supplier will provide the following for Application Software:

- (a) A plan for testing of Application Software for the Purchaser's review and approval, within the time periods allocated therefor in the Project Plan. Such plan will define the standards of performance, functionality and accuracy of the Application Software to be verified during acceptance testing.
- (b) Installation, training and assistance to Purchaser's staff in the Acceptance testing of the Software and Hardware of the Bathymetric System for a minimum period of one month for the software package.
- (c) Technical and user documentation to enable the Purchaser to use and administer the software and data

13.3 Software Support

The Supplier shall provide technical support Services for all Standard and Application Software for the Maintenance Period. As may be further elaborated in the Technical Specifications, maintenance and support services for all Standard and Application Software shall include the following:

- (a) telephone hot-line support for the Coverage Period with two hours maximum response time; and
- (b) emergency "per call" on site service available within two days from receipt the Purchaser's request.

13.4 Training

The Supplier shall provide training for the Systems supplied under this Contract. The training program will be suggested and planned by the Supplier (as part of its bid) and approved by the Purchaser. The training should include all the relevant items required to operate the Systems by the end-user and the operation and management of the systems by the staff according to the Schedule of Requirements.

## 14 Acceptance Tests (GCC Clause 33)

(for additional details see Section VI - Schedule of requirements and Section VIII - Technical Specifications)

The Purchaser will provide the necessary input to the Supplier for development of the Acceptance testing portion of the Project Plan within 30 days from the Effective Date of the Contract.

14.1 The Purchaser, with full cooperation and assistance from the Supplier, shall conduct formal Acceptance tests on the installed Systems to verify their conformance with the Contract requirements. The Acceptance tests defined in the Technical Specifications shall establish a standard of performance which must be met before the Systems are Accepted by the Purchaser. Written certification of Acceptance shall be issued by the Purchaser only after successful completion of the Acceptance tests, and the Purchaser shall not make payments for the Systems until after Acceptance. Acceptance testing shall be subject to the following provisions:

- (a) The Project Plan shall group appropriate components of the Systems together for the purpose of Acceptance testing, scheduling the implementation process.
- (b) Acceptance testing for the System shall end when the System has met the standard(s) of performance defined in the Technical Specifications and according to the Project Plan.
- (c) Within two weeks from the end of the initial Acceptance test, the Purchaser's Project Manager will either certify Acceptance of the System under test, thereby formally commencing its Warranty Period, or provide a written description of the deficiencies that must be rectified before the System can be accepted. Failure to provide such documentation will, by default, constitute Acceptance and shall be so documented by the Supplier.
- (d) If the System fails to meet the standard(s) of performance after forty five days from the start of Acceptance testing, the Purchaser may, at its own option, request a replacement or correction of deficiencies, or terminate the Contract for default and/or return the System for appropriate credits.
- (e) Unsatisfactory performance, inter-connectivity or integration between software packages, computer systems and/or with instruments may result in the Purchaser's rejection of part or all of the System under Acceptance testing.
- (f) The duration of the Acceptance testing shall not exceed three (3) months from the date of Pilot commencement or the date when all corrections are made by the Supplier, whichever is later.

- (g) On successful completion of acceptability test, receipt of deliverables etc., and after the Purchaser is satisfied with the working of the systems, the acceptance certificate (in the prescribed format in Form 12 of Section VII) signed by the Supplier and the Purchaser's Project Manager will be issued. The date on which such certificate is signed shall be deemed to be date of successful commissioning of the systems.

#### 14.2 Application Software Acceptance Tests

- (a) The Acceptance of the Application Software will not be a certification or acceptance of the Systems, and will not replace the Acceptance testing of the Systems after Installation at the Project sites.

#### 14.3 Pilot

- (a) The Pilot will be conducted at site(s) selected by the Purchaser for the installation of the Systems. The Pilot will be conducted for one week, and during this period the Purchaser will notify in writing of any required modifications to the Application software, or any other required adjustments. The Supplier will rectify/adjust the System to the requirements. After the successful conclusion of the Pilot the Systems will be authorized and certified in writing by the Purchaser. If the System fails to meet the standard(s) of performance after one month from the start of the Pilot, the Purchaser may, at its own option, request a termination of the Contract. In that case the Purchaser will pay the Supplier the Contract Price for the hardware, operating systems and communications. The Purchaser will not pay for the specific software: Application Software, Database, GIS and Development tools.

### **15 Warranty (GCC Clause 34)**

The Period of correction of defects is: Four (4) weeks from the date of Purchaser's notice of complaint.

- 15.1 The Supplier warrants that there is no intention of discontinuing production of the Products to be supplied under the Contract within six (6) months following Contract signature. In the event that the Supplier intends to discontinue production of any Product (or has knowledge of third party producers' intention of discontinuing production of a product) after this period, the Supplier shall notify the Purchaser 90 days in advance of such discontinuance to permit the Purchaser, at its option, to procure the necessary quantities of Product, or require that the Supplier propose the contractual substitution of newer, compatible and functionally equivalent Product, in accordance with the Provisions of GCC Clause 36.1. Nothing in SCC Clause 15.1 shall in any way release the Supplier from any warranty, maintenance or support obligations under this Contract or limit the Purchaser's ability to seek other remedies as specified in the Contract.

- 15.2 Without limitation, the Supplier warrants that it shall secure all necessary written agreements, consents and transfer of rights from its employees and other persons or entities whose services are used for the development of Custom Software, including a written agreement with employees that all Custom Software created under the Contract fall within the scope of their employment duties, and that all Intellectual Property Rights in such Custom Software are fully transferable to the Purchaser

## **16 Hardware Maintenance and Software Support (GCC Clause 35)**

- 16.1 Hardware service and support will be supplied as part of the Bathymetric Systems support (SCC Clause 13 above) and will include replacement of malfunctioning parts. Spare parts and supplies shall be supplied as promptly as possible, but not later than 7 days from receipt of the Purchaser's complaint. In the event of expected termination of production of relevant spare parts or supplies, the Supplier shall provide ninety (90) day advance notification to the Purchaser of the pending termination to permit the Purchaser to procure needed stock. During the Maintenance Period the Supplier is responsible for all spare part stocking and part replacement.

## **17 Purchaser's Obligations (GCC Clause 37)**

- 17.1 The Purchaser's Project Manager is : The consignee indicated in the Consignee statement attached to Section VI – Schedule of Requirements.
- 17.2 The Purchaser shall be solely responsible for the preparation and maintenance of survey boats. The Project Manager will designate final installation sites at least 30 days before the scheduled Installation date, to allow the Supplier to perform a site(s) inspection and the survey boats.

## **18 Supplier Obligations (GCC Clause 38)**

- 18.1 The Supplier shall develop a final Project Plan within fourteen (14) days from the Effective Date of the Contract. The Project Plan shall include the following:
- (a) definition of the project implementation tasks, and identification of all major Installation, Acceptance and Service deliverables and milestones;
  - (b) a detailed, fully integrated project schedule covering Installation, Acceptance, training and delivery of other services;
  - (c) identification and scheduling of the specific resources and facilities that the Purchaser is required to provide; and
  - (d) identification of any external dependencies.

## **Section VI**

# **Schedule of Requirements**

# 1. Project General Description

The main objective of the Hydrology Project is to establish a computerised Hydrological Information System (HIS) covering groundwater and surface water quantitative and quality data as well as meteorological components.

One of the R&D components of the Hydrology Project focuses on monitoring of reservoir sedimentation, amongst others by way of bathymetric surveying. The required products comprise depth contours and reservoir capacity versus depth, both in numerical and graphic format. In order to facilitate assessment of changes over time, e.g. sedimentation and erosion, the differences between data sets should be presented in graphical and numerical format. These data sets can be of diverse origins, e.g. bathymetric data, maps, topographic data. Further, there is a need for tools which support assessment of the spread and thickness of fluff layers. A dual frequency echosounder is specified to distinguish between fluff top depth and to some extent the depth of the consolidated bottom.

Under the Hydrology Project, it is planned to introduce effective bathymetric systems in 7 states, viz. Gujarat, Andhra Pradesh, Karnataka, Kerala, Maharashtra, Orissa and Tamil Nadu., and with the Central Water and Power Research Station of the MoWR in Pune. Most agencies are planning to procure 1 bathymetric system whereas the State of Andhra Pradesh aims at procurement of 2 bathymetric systems.

The bathymetric surveying will be the most intense while the reservoirs are at FRL which is normally during the monsoon and immediately thereafter. That period covers several months.

The core of the bathymetric system will be a laptop PC running data acquisition and processing software. The system will acquire depth data from a dual frequency echosounder and position data from a DGPS. Navigation data, such as left/right and depth data, will be made available on a low power LCD display for the helmsman. The PC display will visualise all information required to monitor progress, for control and for quality assessment. A sound velocity sensor for speed of sound setting of the echosounder shall be part of each system. A second, identical, laptop PC is required as backup and for on shore operations, including DGPS set-up and data processing.

The positioning data will be obtained through a DGPS system comprising a reference station which will be operated from known co-ordinates and a mobile system on the survey boat. The communication between reference station and the mobile will be by terrestrial radio. The reach of the radio link shall be sufficient to cover reliably the stretch of the largest reservoir. Although not preferred, for the largest reservoirs, a radio repeater station may be included. For safety reasons, a voice radio channel shall also be made available to facilitate communication between the surveying boat and the operator/guard at the reference station. This voice channel may be implemented making use of the digital radio link or as a separate system using a second radio frequency. The reach of the voice channel shall at least be as large as that of the digital radio link. The delivery shall include a radio permit for the operation of all communication equipment and taking the transmission power requirements into account. Preferably, for all bathymetric systems the same frequency is used.

Power supply shall be from a single car type battery, i.e. 12 VDC nominally. Equipment requiring mains (220 VAC) power is not acceptable. The equipment shall maintain its specifications down to 10 VDC supply voltage. Further, the equipment shall be protected against over-voltage and surges which may occur during connecting/disconnecting as well as when charging the battery while the system is operational. A high capacity mains operated battery charger shall be included in the system.

The architecture of the Bathymetric System shall be as simple as possible and shall be designed for reliable operation under the Indian field conditions. Great attention require the cabling and connectors, they should be sturdy and complying with IP65 rating.

As the Bathymetric System has to be deployed on many reservoirs and in quick succession, it shall be of portable and sturdy design, also taking into account the exposure to shock and vibration during operation, transport, installation, disassembly and handling.

The data processing software shall be user friendly and shall include all functions required for data validation, editing, quality control, processing, analyses, presentation, storage and archiving. In particular functions for calculation of reservoir capacity and depth contours shall be effective and easy to use.

**This Contract will be on a Turn Key basis and includes:**

- all data acquisition equipment and associated accessories.
- the data acquisition software and, if required for use of the software, the associated dongles in sufficient quantity.
- the communication equipment, including DGPS data link and the voice radio link with required permits to be obtained from DoT of India.
- the data processing software and, if required for use of the software, the associated dongles in sufficient quantity.
- installation and commissioning on the survey boats
- thorough training of the end users and staff on theory and practice of sedimentation survey.
- user and operation manuals on all procured items
- maintenance and support for the supplied items for 3 years after expiration of the warranty period. The support must be provided by an adequate establishment having offices in India and capable to cover the full project area.

## 2. Summary of Requirements

Schedules expressed as weeks/months stipulated here-after are dates which are the dates of Installation and Acceptance at the designated Project Sites. All dates and time periods are measured in weeks/months from the date of confirmation of Letter of Credit. Those items marked with an asterisk (\*) are deemed milestones for the assessment of liquidated damages.

| Item Type                           | Quantity         | Description  | Project Site  | Supply and Installation Schedule                                    | Acceptance Schedule                           |
|-------------------------------------|------------------|--|---|---|---|
| I.(a) Integrated Bathymetric System | Eleven (11) sets | Each set consisting one each of the following and in conformity with Technical Specifications in Schedule VIII:<br>i) Hydrographic Echosounder<br>ii) Sound Velocity Calibrator<br>iii) Differential Global Positioning System<br>iv) Data Collection Computer<br>v) Bathymetry Software | Project sites are one each in the States of Orissa, Maharashtra, Tamilnadu, Karnataka, Kerala, Madhya Pradesh, CWPRS (Pune) and two sites in the States of Gujarat and Andhra Pradesh | *Six (6) months to individual consignees as per statement attached. | Four (4) weeks from the date of installation. |
| (b) Survey boat and accessories     | Eleven (11) sets | i) Survey boat<br>ii) Boat trailer<br>iii) Outboard engines<br>iv) Voice radio system  | Project sites are one each in the States of Orissa, Maharashtra, Tamilnadu, Karnataka, Kerala, Madhya Pradesh, CWPRS (Pune) and two sites in the States of Gujarat and Andhra Pradesh | *Concurrent with 1(a) above   | Concurrent with 1 (a) above.                  |



|                         |                  |  |   |                             |                              |
|-------------------------|------------------|--|---|-----------------------------|------------------------------|
| (c) Auxiliary equipment | Eleven sets (11) | <ul style="list-style-type: none"> <li>i) Battery charger</li> <li>ii) Generator</li> <li>iii) UPS</li> <li>iv) PC</li> <li>v) CD-recorder</li> <li>vi) Plotter</li> <li>vii) Printer</li> </ul> | Project sites are one each in the States of Orissa, Maharashtra, Tamilnadu, Karnataka, Kerala, Madhya Pradesh, CWPRS (Pune) and two sites in the States of Gujarat and Andhra Pradesh | *Concurrent with 1(a) above | Concurrent with 1 (a) above. |
|-------------------------|------------------|--|---|-----------------------------|------------------------------|

| Item Type                                  | Quantity   | Description  | Project Site  | Supply and Installation Schedule  | Acceptance Schedule  |
|--|--|--|---|---|--|
| II Implementation Services<br>(a) Training | One hundred sixty five (165) Mandays (3 personnel for 5 days for each Consignee) | Training of three (3) personnel each of the eight Consignees for five days each comprising of :<br>i) One day exposure to the Integrated Bathymetric System and its component.<br>ii) Two days hands-on training in surveying a selected reservoir in each state.<br>iii) Two days training in operation and maintenance of each of the components of the system and the Integrated System<br>iv) Trouble shooting and rectification of malfunctions | Identified Project sites in each of the Consignee's domain. | To commence before expiration of two (2) weeks from Acceptance of items 1(a) above  | Within one (1) week of completion of training                      |
| (b) Product Support Services               | One (1) Year   | Performance of Warranty obligations  | As in item I(a) above                                       | To commence immediately after the latest date of acceptance of items at 1(a) above. | Within two (2) weeks after completion of the Warranty obligations. |

| <b>Item Type</b>    | <b>Quantity</b> | <b>Description</b>  | <b>Project Site</b> | <b>Supply and Installation Schedule</b>   | <b>Acceptance Schedule</b>  |
|---------------------|-----------------|---|---------------------|---|---|
| III Recurrent Costs | Three years     | Performance of the Annual Maintenance of the Integrated Bathymetric System as well as the individual components including updating of operational software(s) to keep the system fully operational. | As in item 1 (a)    | To commence services within a week of completion of the warranty period and by signing a Supplementary Contract with appropriate performance security | Within two (2) weeks of completion of Annual Maintenance each year. |

### 3. List of Consignees' address, Telephone/fax numbers

| S.No | Name and Address of Consignee   | No. of set of Bathymetry Survey Equipments | Telephone No.             | Fax No.     |
|------|---|--|---------------------------|-------------|
| 1.   | Deputy Director<br>Data Archieving & Publishing<br>Unit – 8, Delta Colony<br>Bhubaneshwar – 751 012<br>Orissa | One  |                           |             |
| 2.   | Joint Director<br>APERL, Himayat Sagar<br>Hyderabad – 500 030<br>Andhra Pradesh                               | Two  | 040 - 4015071/<br>4015052 |             |
| 3.   | Chief Research Officer<br>Hydraulics Division<br>KERS, KR Sagar-571 607<br>Karnataka                          | One  | 08236-57253               | 0821-402672 |
| 4.   | Research Officer<br>Hydro Dynamic Division No. II<br>MERI, NASHIK – 422 004<br>Maharashtra                    | One  |                           |             |
| 5.   | Joint Director<br>Hydraulics, KERI, PEECHI<br>Thrissur District<br>Kerala                                     | One  | 0487-782013               |             |

|    |   |     |                           |             |
|----|---|-----|---------------------------|-------------|
| 6. | Mr. D.B. Jadav<br>Executive Engineer,<br>WRI Divn. No.1, Bhadra Fort<br>Lal Darwaza, Ahmedabad – 380 013<br>Gujarat | One | 5507098                   | 5507019     |
| 7. | The Executive Engineer<br>Groundwater Division,<br>IInd Floor, Kuralaga<br>Chennai – 600 108<br>Tamil Nadu          | One | 044-5342241               |             |
| 8. | Senior Research Officer<br>Procurement & Services<br>CWPRS, Khadakwasla P.O<br>Pune 411 024<br>Maharashtra          | One | 0212-592511<br>Extn. 3372 | 0212-592004 |

# **Section VII**

## **Sample Forms**

### **Notes for the Bidders on the Sample Forms**

The Bidder shall complete and submit with its bid the appropriate Bid Form and the required Price Schedules and in accordance with the requirements included in the Bidding Documents.

The Bidder should provide the Bid Security, either in the form included hereafter or in another form acceptable to the Purchaser, pursuant to the Bid Data Sheet.

The Contract Form, when it is finalized at the time of Contract award, should incorporate any corrections or modifications to the accepted bid resulting from price corrections, or quantity variations pursuant to the Bid Data Sheet. The Price Schedule and Schedule of Requirements deemed to form part of the Contract should be modified accordingly.

The Performance Security form should not be completed by the bidders at the time of their bid preparation. Only the successful Bidder will be required to provide performance security in accordance with one of the forms indicated herein or in another form acceptable to the Purchaser and pursuant to GCC Clause 17 and SCC Clause 5, respectively.

The Producer's Authorization form should be completed by the producer, as specified.

## **Table of Sample Forms**

1. Bid Form
2. Price Schedule
  - Schedule 2.1 Imported Products Price Schedule
  - Schedule 2.2 Locally Supplied Products Price Schedule
  - Schedule 2.3 Services Price Schedule (prior to maintenance)
  - Schedule 2.4 Inland Delivery Price Schedule
3. Recurrent Costs Form
4. Bid Price Summary Form
5. Bid Security Form
6. Form of Contract Agreement
7. Performance Security Form
8. Service Support Details
9. Producer's Authorisation Form
10. Form of Declaration regarding Deemed Export Benefit
11. Proforma for Performance Statement
12. Proforma of Certificate for issue by the Purchaser after successful commissioning/installation of the equipment/product.



# 1. Bid Forms

Date: \_\_\_\_\_  
Loan No. Credit 2774 - IN  
IFB No. ICB/GOG/WRI/ /

To: *[name and address of the Purchaser]*

Gentlemen and/or Ladies:

Having examined the Biding Documents including Addenda Nos. *[Insert numbers]*, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to produce, deliver, install, support and maintain the Integrated Bathymetric System in full conformity with the said Bidding Documents, for the sum of *[total bid amount in works and figures, by currency if appropriate]* or such other sums as may be determined in accordance with the Contract.

We undertake, if our Bid is accepted, to install the Systems in accordance with the schedule specified in the Schedule of Requirements.

If our Bid is accepted, we will provide a Performance Security in the form and in the amounts, and within the times stipulated in the Bidding Documents.

We agree to abide by this bid for a period of one hundred twenty (120) days from the date fixed for bid submission in the Bid Data Sheet, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

Until a formal Contract is prepared and executed, this Bid, together with your written acceptance thereof and your notification of award, shall constitute a binding Contract between us.

Commissions or gratuities, if any, paid or to be paid by us to agents relating to this Bid, and to contract execution if we are awarded the Contract, are listed below:

| Name and Address of agent | Amount and Currency | Purpose of Commission or Gratuity |
|---------------------------|---------------------|-----------------------------------|
|                           |                     |                                   |
|                           |                     |                                   |

(if none, state "none")

We understand that you are not bound to accept the lowest or any bid you may receive.

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_\_

\_\_\_\_\_  
*[signature]*

\_\_\_\_\_  
*[in the capacity of]*

Duly authorized to sign Bid for and on behalf of \_\_\_\_\_

## 2.0 Price Schedules

**Consignee state: Gujarat**

### Schedule 2.1. Imported Products Price Schedule [10.2(a) of ITB] (excluding inland transportation)

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply, and installation | Quantity | Indian Agent's name and address | Unit price CIP named place of destination | Shipment weight and volume | Agency Commission % of CIP Price included in the quoted price. | Total CIP price |
|----------|--|-------------------|------------------|---|----------|---------------------------------|---|----------------------------|--|-----------------|
| (1)      | (2)                                    | (3)               | (4)              | (5)   | (6)      | (7)                             | (8)                                       | (9)                        | (10)   | (11)=(6)x(8)    |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |   |          |                                 |   |                            |  |                 |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |   | 2        |                                 |   |                            |  |                 |
| 2.       | Sound Velocity Calibrator              |                   |                  |   | 2        |                                 |   |                            |  |                 |
| 3.       | Differential Global Positioning System |                   |                  |   | 2        |                                 |   |                            |  |                 |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |   | 4        |                                 |   |                            |  |                 |

|          |                                    |  |  |  |          |  |  |  |  |  |
|----------|------------------------------------|--|--|--|----------|--|--|--|--|--|
| 5.       | Bathymetry Software                |  |  |  | 6 sets   |  |  |  |  |  |
|          | Sub Total                          |  |  |  |          |  |  |  |  |  |
| <b>B</b> | <b>Survey Boat and Accessories</b> |  |  |  |          |  |  |  |  |  |
| 1.       | Survey Boat                        |  |  |  | 2        |  |  |  |  |  |
| 2.       | Boat Trailer                       |  |  |  | 2        |  |  |  |  |  |
| 3.       | Outboard Engine                    |  |  |  | 4        |  |  |  |  |  |
| 4.       | Voice Radio (set)                  |  |  |  | 2        |  |  |  |  |  |
|          | Sub Total                          |  |  |  |          |  |  |  |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b>         |  |  |  |          |  |  |  |  |  |
| 1.       | Battery Charger                    |  |  |  | 4        |  |  |  |  |  |
| 2.       | Generator                          |  |  |  | 4        |  |  |  |  |  |
| 3.       | UPS                                |  |  |  | 2        |  |  |  |  |  |
| 4.       | PC                                 |  |  |  | 4        |  |  |  |  |  |
| 5.       | CD Recorder                        |  |  |  | 2        |  |  |  |  |  |
| 6.       | Plotter                            |  |  |  | 2        |  |  |  |  |  |
| 7.       | Printer                            |  |  |  | 2        |  |  |  |  |  |
|          | Sub Total                          |  |  |  |          |  |  |  |  |  |
|          | <b>TOTALS</b>                      |  |  |  | Two sets |  |  |  |  |  |

*The form should be filled according to the Schedule of Requirements*

- Note: 1. A separate copy of the form should be used for each different currency quoted, in accordance with ITB Clause 11.  
2. In case of discrepancy between unit price and total, the unit price shall prevail.

Signature of the Bidder \_\_\_\_\_

All items, with the exception of any software, are subject to application of Domestic Preference in accordance with ITB Clause 24

Consignee state: Orissa

**Schedule 2.1. Imported Products Price Schedule [10.2(a) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply, and installation | Quantity | Indian Agent's name and address | Unit price CIP named place of destination | Shipment weight and volume | Agency Commission % of CIP Price included in the quoted price. | Total CIP price |
|----------|--|-------------------|------------------|---|----------|---------------------------------|---|----------------------------|--|-----------------|
| (1)      | (2)                                    | (3)               | (4)              | (5)   | (6)      | (7)                             | (8)                                       | (9)                        | (10)   | (11)=(6)x(8)    |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |   |          |                                 |   |                            |  |                 |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 2.       | Sound Velocity Calibrator              |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 3.       | Differential Global Positioning System |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |   | 2        |                                 |   |                            |  |                 |

|          |                                    |  |  |  |         |  |  |  |  |  |
|----------|------------------------------------|--|--|--|---------|--|--|--|--|--|
| 5.       | Bathymetry Software                |  |  |  | 3 sets  |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>B</b> | <b>Survey Boat and Accessories</b> |  |  |  |         |  |  |  |  |  |
| 1.       | Survey Boat                        |  |  |  | 1       |  |  |  |  |  |
| 2.       | Boat Trailer                       |  |  |  | 1       |  |  |  |  |  |
| 3.       | Outboard Engine                    |  |  |  | 2       |  |  |  |  |  |
| 4.       | Voice Radio (set)                  |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b>         |  |  |  |         |  |  |  |  |  |
| 1.       | Battery Charger                    |  |  |  | 2       |  |  |  |  |  |
| 2.       | Generator                          |  |  |  | 2       |  |  |  |  |  |
| 3.       | UPS                                |  |  |  | 1       |  |  |  |  |  |
| 4.       | PC                                 |  |  |  | 2       |  |  |  |  |  |
| 5.       | CD Recorder                        |  |  |  | 1       |  |  |  |  |  |
| 6.       | Plotter                            |  |  |  | 1       |  |  |  |  |  |
| 7.       | Printer                            |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
|          | <b>TOTAL</b>                       |  |  |  | One Set |  |  |  |  |  |

*The form should be filled according to the Schedule of Requirements*

- Note: 1. A separate copy of the form should be used for each different currency quoted, in accordance with ITB Clause 11.  
2. In case of discrepancy between unit price and total, the unit price shall prevail.

Signature of the Bidder \_\_\_\_\_

All items, with the exception of any software, are subject to application of Domestic Preference in accordance with ITB Clause 24

Consignee state: Maharashtra

**Schedule 2.1. Imported Products Price Schedule [10.2(a) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply, and installation | Quantity | Indian Agent's name and address | Unit price CIP named place of destination | Shipment weight and volume | Agency Commission % of CIP Price included in the quoted price. | Total CIP price |
|----------|--|-------------------|------------------|---|----------|---------------------------------|---|----------------------------|--|-----------------|
| (1)      | (2)                                    | (3)               | (4)              | (5)   | (6)      | (7)                             | (8)                                       | (9)                        | (10)   | (11)=(6)x(8)    |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |   |          |                                 |   |                            |  |                 |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 2.       | Sound Velocity Calibrator              |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 3.       | Differential Global Positioning System |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |   | 2        |                                 |   |                            |  |                 |

|          |                                    |  |  |  |         |  |  |  |  |  |
|----------|------------------------------------|--|--|--|---------|--|--|--|--|--|
| 5.       | Bathymetry Software                |  |  |  | 3 sets  |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>B</b> | <b>Survey Boat and Accessories</b> |  |  |  |         |  |  |  |  |  |
| 1.       | Survey Boat                        |  |  |  | 1       |  |  |  |  |  |
| 2.       | Boat Trailer                       |  |  |  | 1       |  |  |  |  |  |
| 3.       | Outboard Engine                    |  |  |  | 2       |  |  |  |  |  |
| 4.       | Voice Radio (set)                  |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b>         |  |  |  |         |  |  |  |  |  |
| 1.       | Battery Charger                    |  |  |  | 2       |  |  |  |  |  |
| 2.       | Generator                          |  |  |  | 2       |  |  |  |  |  |
| 3.       | UPS                                |  |  |  | 1       |  |  |  |  |  |
| 4.       | PC                                 |  |  |  | 2       |  |  |  |  |  |
| 5.       | CD Recorder                        |  |  |  | 1       |  |  |  |  |  |
| 6.       | Plotter                            |  |  |  | 1       |  |  |  |  |  |
| 7.       | Printer                            |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
|          | <b>TOTAL</b>                       |  |  |  | One Set |  |  |  |  |  |

*The form should be filled according to the Schedule of Requirements*

- Note: 1. A separate copy of the form should be used for each different currency quoted, in accordance with ITB Clause 11.  
2. In case of discrepancy between unit price and total, the unit price shall prevail.

Signature of the Bidder \_\_\_\_\_

All items, with the exception of any software, are subject to application of Domestic Preference in accordance with ITB Clause 24

Consignee: CWPRS (Pune)

**Schedule 2.1. Imported Products Price Schedule [10.2(a) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply, and installation | Quantity | Indian Agent's name and address | Unit price CIP named place of destination | Shipment weight and volume | Agency Commission % of CIP Price included in the quoted price. | Total CIP price |
|----------|--|-------------------|------------------|---|----------|---------------------------------|---|----------------------------|--|-----------------|
| (1)      | (2)                                    | (3)               | (4)              | (5)   | (6)      | (7)                             | (8)                                       | (9)                        | (10)   | (11)=(6)x(8)    |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |   |          |                                 |   |                            |  |                 |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 2.       | Sound Velocity Calibrator              |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 3.       | Differential Global Positioning System |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |   | 2        |                                 |   |                            |  |                 |



|          |                                    |  |  |  |         |  |  |  |  |  |
|----------|------------------------------------|--|--|--|---------|--|--|--|--|--|
| 5.       | Bathymetry Software                |  |  |  | 3 sets  |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>B</b> | <b>Survey Boat and Accessories</b> |  |  |  |         |  |  |  |  |  |
| 1.       | Survey Boat                        |  |  |  | 1       |  |  |  |  |  |
| 2.       | Boat Trailer                       |  |  |  | 1       |  |  |  |  |  |
| 3.       | Outboard Engine                    |  |  |  | 2       |  |  |  |  |  |
| 4.       | Voice Radio (set)                  |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b>         |  |  |  |         |  |  |  |  |  |
| 1.       | Battery Charger                    |  |  |  | 2       |  |  |  |  |  |
| 2.       | Generator                          |  |  |  | 2       |  |  |  |  |  |
| 3.       | UPS                                |  |  |  | 1       |  |  |  |  |  |
| 4.       | PC                                 |  |  |  | 2       |  |  |  |  |  |
| 5.       | CD Recorder                        |  |  |  | 1       |  |  |  |  |  |
| 6.       | Plotter                            |  |  |  | 1       |  |  |  |  |  |
| 7.       | Printer                            |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
|          | <b>TOTAL</b>                       |  |  |  | One Set |  |  |  |  |  |

*The form should be filled according to the Schedule of Requirements*

- Note: 1. A separate copy of the form should be used for each different currency quoted, in accordance with ITB Clause 11.  
2. In case of discrepancy between unit price and total, the unit price shall prevail.

Signature of the Bidder \_\_\_\_\_

All items, with the exception of any software, are subject to application of Domestic Preference in accordance with ITB Clause 24

Consignee state: Andhra Pradesh

**Schedule 2.1. Imported Products Price Schedule [10.2(a) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply, and installation | Quantity | Indian Agent's name and address | Unit price CIP named place of destination | Shipment weight and volume | Agency Commission % of CIP Price included in the quoted price. | Total CIP price |
|----------|--|-------------------|------------------|---|----------|---------------------------------|---|----------------------------|--|-----------------|
| (1)      | (2)                                    | (3)               | (4)              | (5)   | (6)      | (7)                             | (8)                                       | (9)                        | (10)   | (11)=(6)x(8)    |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |   |          |                                 |   |                            |  |                 |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |   | 2        |                                 |   |                            |  |                 |
| 2.       | Sound Velocity Calibrator              |                   |                  |   | 2        |                                 |   |                            |  |                 |
| 3.       | Differential Global Positioning System |                   |                  |   | 2        |                                 |   |                            |  |                 |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |   | 4        |                                 |   |                            |  |                 |

|          |                                    |  |  |  |          |  |  |  |  |  |
|----------|------------------------------------|--|--|--|----------|--|--|--|--|--|
| 5.       | Bathymetry Software                |  |  |  | 6 sets   |  |  |  |  |  |
|          | Sub Total                          |  |  |  |          |  |  |  |  |  |
| <b>B</b> | <b>Survey Boat and Accessories</b> |  |  |  |          |  |  |  |  |  |
| 1.       | Survey Boat                        |  |  |  | 2        |  |  |  |  |  |
| 2.       | Boat Trailer                       |  |  |  | 2        |  |  |  |  |  |
| 3.       | Outboard Engine                    |  |  |  | 4        |  |  |  |  |  |
| 4.       | Voice Radio (set)                  |  |  |  | 2        |  |  |  |  |  |
|          | Sub Total                          |  |  |  |          |  |  |  |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b>         |  |  |  |          |  |  |  |  |  |
| 1.       | Battery Charger                    |  |  |  | 4        |  |  |  |  |  |
| 2.       | Generator                          |  |  |  | 4        |  |  |  |  |  |
| 3.       | UPS                                |  |  |  | 2        |  |  |  |  |  |
| 4.       | PC                                 |  |  |  | 4        |  |  |  |  |  |
| 5.       | CD Recorder                        |  |  |  | 2        |  |  |  |  |  |
| 6.       | Plotter                            |  |  |  | 2        |  |  |  |  |  |
| 7.       | Printer                            |  |  |  | 2        |  |  |  |  |  |
|          | Sub Total                          |  |  |  |          |  |  |  |  |  |
|          | <b>TOTALS</b>                      |  |  |  | Two sets |  |  |  |  |  |

*The form should be filled according to the Schedule of Requirements*

- Note: 1. A separate copy of the form should be used for each different currency quoted, in accordance with ITB Clause 11.  
2. In case of discrepancy between unit price and total, the unit price shall prevail.

Signature of the Bidder \_\_\_\_\_

All items, with the exception of any software, are subject to application of Domestic Preference in accordance with ITB Clause 24

Consignee state: Tamil Nadu

Schedule 2.1. Imported Products Price Schedule [10.2(a) of ITB]  
(excluding inland transportation)

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply, and installation | Quantity | Indian Agent's name and address | Unit price CIP named place of destination | Shipment weight and volume | Agency Commission % of CIP Price included in the quoted price. | Total CIP price |
|----------|--|-------------------|------------------|---|----------|---------------------------------|---|----------------------------|--|-----------------|
| (1)      | (2)                                    | (3)               | (4)              | (5)   | (6)      | (7)                             | (8)                                       | (9)                        | (10)   | (11)=(6)x(8)    |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |   |          |                                 |   |                            |  |                 |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 2.       | Sound Velocity Calibrator              |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 3.       | Differential Global Positioning System |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |   | 2        |                                 |   |                            |  |                 |

|          |                                    |  |  |  |         |  |  |  |  |  |
|----------|------------------------------------|--|--|--|---------|--|--|--|--|--|
| 5.       | Bathymetry Software                |  |  |  | 3 sets  |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>B</b> | <b>Survey Boat and Accessories</b> |  |  |  |         |  |  |  |  |  |
| 1.       | Survey Boat                        |  |  |  | 1       |  |  |  |  |  |
| 2.       | Boat Trailer                       |  |  |  | 1       |  |  |  |  |  |
| 3.       | Outboard Engine                    |  |  |  | 2       |  |  |  |  |  |
| 4.       | Voice Radio (set)                  |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b>         |  |  |  |         |  |  |  |  |  |
| 1.       | Battery Charger                    |  |  |  | 2       |  |  |  |  |  |
| 2.       | Generator                          |  |  |  | 2       |  |  |  |  |  |
| 3.       | UPS                                |  |  |  | 1       |  |  |  |  |  |
| 4.       | PC                                 |  |  |  | 2       |  |  |  |  |  |
| 5.       | CD Recorder                        |  |  |  | 1       |  |  |  |  |  |
| 6.       | Plotter                            |  |  |  | 1       |  |  |  |  |  |
| 7.       | Printer                            |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
|          | <b>TOTAL</b>                       |  |  |  | One Set |  |  |  |  |  |

*The form should be filled according to the Schedule of Requirements*

- Note: 1. A separate copy of the form should be used for each different currency quoted, in accordance with ITB Clause 11.  
2. In case of discrepancy between unit price and total, the unit price shall prevail.

Signature of the Bidder \_\_\_\_\_

All items, with the exception of any software, are subject to application of Domestic Preference in accordance with ITB Clause 24

Consignee state: Karnataka

**Schedule 2.1. Imported Products Price Schedule [10.2(a) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply, and installation | Quantity | Indian Agent's name and address | Unit price CIP named place of destination | Shipment weight and volume | Agency Commission % of CIP Price included in the quoted price. | Total CIP price |
|----------|--|-------------------|------------------|---|----------|---------------------------------|---|----------------------------|--|-----------------|
| (1)      | (2)                                    | (3)               | (4)              | (5)   | (6)      | (7)                             | (8)                                       | (9)                        | (10)   | (11)=(6)x(8)    |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |   |          |                                 |   |                            |  |                 |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 2.       | Sound Velocity Calibrator              |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 3.       | Differential Global Positioning System |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |   | 2        |                                 |   |                            |  |                 |

|          |                                    |  |  |  |         |  |  |  |  |  |
|----------|------------------------------------|--|--|--|---------|--|--|--|--|--|
| 5.       | Bathymetry Software                |  |  |  | 3 sets  |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>B</b> | <b>Survey Boat and Accessories</b> |  |  |  |         |  |  |  |  |  |
| 1.       | Survey Boat                        |  |  |  | 1       |  |  |  |  |  |
| 2.       | Boat Trailer                       |  |  |  | 1       |  |  |  |  |  |
| 3.       | Outboard Engine                    |  |  |  | 2       |  |  |  |  |  |
| 4.       | Voice Radio (set)                  |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b>         |  |  |  |         |  |  |  |  |  |
| 1.       | Battery Charger                    |  |  |  | 2       |  |  |  |  |  |
| 2.       | Generator                          |  |  |  | 2       |  |  |  |  |  |
| 3.       | UPS                                |  |  |  | 1       |  |  |  |  |  |
| 4.       | PC                                 |  |  |  | 2       |  |  |  |  |  |
| 5.       | CD Recorder                        |  |  |  | 1       |  |  |  |  |  |
| 6.       | Plotter                            |  |  |  | 1       |  |  |  |  |  |
| 7.       | Printer                            |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
|          | <b>TOTAL</b>                       |  |  |  | One Set |  |  |  |  |  |

*The form should be filled according to the Schedule of Requirements*

- Note: 1. A separate copy of the form should be used for each different currency quoted, in accordance with ITB Clause 11.  
2. In case of discrepancy between unit price and total, the unit price shall prevail.

Signature of the Bidder \_\_\_\_\_

All items, with the exception of any software, are subject to application of Domestic Preference in accordance with ITB Clause 24

Consignee state: Kerala

**Schedule 2.1. Imported Products Price Schedule [10.2(a) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply, and installation | Quantity | Indian Agent's name and address | Unit price CIP named place of destination | Shipment weight and volume | Agency Commission % of CIP Price included in the quoted price. | Total CIP price |
|----------|--|-------------------|------------------|---|----------|---------------------------------|---|----------------------------|--|-----------------|
| (1)      | (2)                                    | (3)               | (4)              | (5)   | (6)      | (7)                             | (8)                                       | (9)                        | (10)   | (11)=(6)x(8)    |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |   |          |                                 |   |                            |  |                 |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 2.       | Sound Velocity Calibrator              |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 3.       | Differential Global Positioning System |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |   | 2        |                                 |   |                            |  |                 |



|          |                                    |  |  |  |         |  |  |  |  |  |
|----------|------------------------------------|--|--|--|---------|--|--|--|--|--|
| 5.       | Bathymetry Software                |  |  |  | 3 sets  |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>B</b> | <b>Survey Boat and Accessories</b> |  |  |  |         |  |  |  |  |  |
| 1.       | Survey Boat                        |  |  |  | 1       |  |  |  |  |  |
| 2.       | Boat Trailer                       |  |  |  | 1       |  |  |  |  |  |
| 3.       | Outboard Engine                    |  |  |  | 2       |  |  |  |  |  |
| 4.       | Voice Radio (set)                  |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b>         |  |  |  |         |  |  |  |  |  |
| 1.       | Battery Charger                    |  |  |  | 2       |  |  |  |  |  |
| 2.       | Generator                          |  |  |  | 2       |  |  |  |  |  |
| 3.       | UPS                                |  |  |  | 1       |  |  |  |  |  |
| 4.       | PC                                 |  |  |  | 2       |  |  |  |  |  |
| 5.       | CD Recorder                        |  |  |  | 1       |  |  |  |  |  |
| 6.       | Plotter                            |  |  |  | 1       |  |  |  |  |  |
| 7.       | Printer                            |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
|          | <b>TOTAL</b>                       |  |  |  | One Set |  |  |  |  |  |

*The form should be filled according to the Schedule of Requirements*

- Note: 1. A separate copy of the form should be used for each different currency quoted, in accordance with ITB Clause 11.  
2. In case of discrepancy between unit price and total, the unit price shall prevail.

Signature of the Bidder \_\_\_\_\_

All items, with the exception of any software, are subject to application of Domestic Preference in accordance with ITB Clause 24

**Consignee state: Madhya Pradesh**

**Schedule 2.1. Imported Products Price Schedule [10.2(a) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply, and installation | Quantity | Indian Agent's name and address | Unit price CIP named place of destination | Shipment weight and volume | Agency Commission % of CIP Price included in the quoted price. | Total CIP price |
|----------|--|-------------------|------------------|---|----------|---------------------------------|---|----------------------------|--|-----------------|
| (1)      | (2)                                    | (3)               | (4)              | (5)   | (6)      | (7)                             | (8)                                       | (9)                        | (10)   | (11)=(6)x(8)    |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |   |          |                                 |   |                            |  |                 |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 2.       | Sound Velocity Calibrator              |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 3.       | Differential Global Positioning System |                   |                  |   | 1        |                                 |   |                            |  |                 |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |   | 2        |                                 |   |                            |  |                 |

|          |                                    |  |  |  |         |  |  |  |  |  |
|----------|------------------------------------|--|--|--|---------|--|--|--|--|--|
| 5.       | Bathymetry Software                |  |  |  | 3 sets  |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>B</b> | <b>Survey Boat and Accessories</b> |  |  |  |         |  |  |  |  |  |
| 1.       | Survey Boat                        |  |  |  | 1       |  |  |  |  |  |
| 2.       | Boat Trailer                       |  |  |  | 1       |  |  |  |  |  |
| 3.       | Outboard Engine                    |  |  |  | 2       |  |  |  |  |  |
| 4.       | Voice Radio (set)                  |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b>         |  |  |  |         |  |  |  |  |  |
| 1.       | Battery Charger                    |  |  |  | 2       |  |  |  |  |  |
| 2.       | Generator                          |  |  |  | 2       |  |  |  |  |  |
| 3.       | UPS                                |  |  |  | 1       |  |  |  |  |  |
| 4.       | PC                                 |  |  |  | 2       |  |  |  |  |  |
| 5.       | CD Recorder                        |  |  |  | 1       |  |  |  |  |  |
| 6.       | Plotter                            |  |  |  | 1       |  |  |  |  |  |
| 7.       | Printer                            |  |  |  | 1       |  |  |  |  |  |
|          | Sub Total                          |  |  |  |         |  |  |  |  |  |
|          | <b>TOTAL</b>                       |  |  |  | One Set |  |  |  |  |  |

*The form should be filled according to the Schedule of Requirements*

- Note: 1. A separate copy of the form should be used for each different currency quoted, in accordance with ITB Clause 11.  
2. In case of discrepancy between unit price and total, the unit price shall prevail.

Signature of the Bidder \_\_\_\_\_

All items, with the exception of any software, are subject to application of Domestic Preference in accordance with ITB Clause 24

Consignee state: Gujarat

**Schedule 2.2. Products offered from India Price Schedule [10.2 (b) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply and installation | Quantity | Unit price EXW <sup>1</sup> per item | Total price EXW per item <sup>2</sup> | Total sales and other taxes payable <sup>3</sup> if Contract is awarded |
|----------|--|-------------------|------------------|--|----------|--------------------------------------|---------------------------------------|---|
| (1)      | (2)                                    | (3)               | (4)              | (5)  | (6)      | (7)                                  | (8)=(6)x(7)                           | (9)   |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |  |          |                                      |                                       |   |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |  | 2        |                                      |                                       |   |
| 2.       | Sound Velocity Calibrator              |                   |                  |  | 2        |                                      |                                       |   |
| 3.       | Differential Global Positioning System |                   |                  |  | 2        |                                      |                                       |   |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |  | 4        |                                      |                                       |   |
| 5.       | Bathymetry software                    |                   |                  |  | 6 sets   |                                      |                                       |   |
|          | Sub Total                              |                   |                  |  |          |                                      |                                       |   |
| <b>B</b> | <b>Survey Boat and Accessories</b>     |                   |                  |  |          |                                      |                                       |   |
| 1.       | Survey Boat                            |                   |                  |  | 2        |                                      |                                       |   |
| 2.       | Boat Trailer                           |                   |                  |  | 2        |                                      |                                       |   |
| 3.       | Outboard Engine                        |                   |                  |  | 4        |                                      |                                       |   |
| 4.       | Voice Radio (set)                      |                   |                  |  | 2        |                                      |                                       |   |

<sup>1</sup> Currencies to be used in accordance with the Instruction to Bidders. The EXW unit price shall include customs duties and sales and other taxes already paid or payable on the components used in the production of the items, or the customs duties and sales and other taxes paid on previously imported items. The factors should not be entered separately.

<sup>2</sup> In case of discrepancy between unit price and total, the unit price shall prevail. In case of discrepancy between subtotals and the total, the subtotal shall prevail

<sup>3</sup> Specify according to the Instruction to Bidders and the related provisions in the Bid Data Sheet.

|          |                            |  |  |  |   |          |  |  |
|----------|----------------------------|--|--|--|---|----------|--|--|
|          | Sub Total                  |  |  |  |   |          |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b> |  |  |  |   |          |  |  |
| 1.       | Battery Charger            |  |  |  | 4 |          |  |  |
| 2.       | Generator                  |  |  |  | 4 |          |  |  |
| 3.       | UPS                        |  |  |  | 2 |          |  |  |
| 4.       | PC                         |  |  |  | 4 |          |  |  |
| 5.       | CD Recorder                |  |  |  | 2 |          |  |  |
| 6.       | Plotter                    |  |  |  | 2 |          |  |  |
| 7.       | Printer                    |  |  |  | 2 |          |  |  |
|          | Sub Total                  |  |  |  |   |          |  |  |
|          | <b>TOTALS</b>              |  |  |  |   | Two sets |  |  |

*The form should be filled according to the Schedule of Requirements*

Signature of the Bidder \_\_\_\_\_

Consignee state: Orissa

**Schedule 2.2. Products offered from India Price Schedule [10.2 (b) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply and installation | Quantity | Unit price EXW <sup>1</sup> per item | Total price EXW per item <sup>2</sup> | Total sales and other taxes payable <sup>3</sup> if Contract is awarded |
|----------|--|-------------------|------------------|--|----------|--------------------------------------|---------------------------------------|---|
| (1)      | (2)                                    | (3)               | (4)              | (5)  | (6)      | (7)                                  | (8)=(6)x(7)                           | (9)   |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |  |          |                                      |                                       |   |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Sound Velocity Calibrator              |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Differential Global Positioning System |                   |                  |  | 1        |                                      |                                       |   |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |  | 2        |                                      |                                       |   |
| 5.       | Bathymetry Software                    |                   |                  |  | 3 sets   |                                      |                                       |   |
|          | Sub Total                              |                   |                  |  |          |                                      |                                       |   |
| <b>B</b> | <b>Survey Boat and Accessories</b>     |                   |                  |  |          |                                      |                                       |   |
| 1.       | Survey Boat                            |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Boat Trailer                           |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Outboard Engine                        |                   |                  |  | 2        |                                      |                                       |   |
| 4.       | Voice Radio (set)                      |                   |                  |  | 1        |                                      |                                       |   |

<sup>1</sup> Currencies to be used in accordance with the Instruction to Bidders. The EXW unit price shall include customs duties and sales and other taxes already paid or payable on the components used in the production of the items, or the customs duties and sales and other taxes paid on previously imported items. The factors should not be entered separately.

<sup>2</sup> In case of discrepancy between unit price and total, the unit price shall prevail. In case of discrepancy between subtotals and the total, the subtotal shall prevail

<sup>3</sup> Specify according to the Instruction to Bidders and the related provisions in the Bid Data Sheet.

|          |                            |  |  |  |   |         |  |  |
|----------|----------------------------|--|--|--|---|---------|--|--|
|          | Sub Total                  |  |  |  |   |         |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b> |  |  |  |   |         |  |  |
| 1.       | Battery Charger            |  |  |  | 2 |         |  |  |
| 2.       | Generator                  |  |  |  | 2 |         |  |  |
| 3.       | UPS                        |  |  |  | 1 |         |  |  |
| 4.       | PC                         |  |  |  | 2 |         |  |  |
| 5.       | CD Recorder                |  |  |  | 1 |         |  |  |
| 6.       | Plotter                    |  |  |  | 1 |         |  |  |
| 7.       | Printer                    |  |  |  | 1 |         |  |  |
|          | Sub Total                  |  |  |  |   |         |  |  |
|          | <b>TOTAL</b>               |  |  |  |   | One Set |  |  |

*The form should be filled according to the Schedule of Requirements*

Signature of the Bidder \_\_\_\_\_

**Consignee state: Maharashtra**

**Schedule 2.2. Products offered from India Price Schedule [10.2 (b) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply and installation | Quantity | Unit price EXW <sup>1</sup> per item | Total price EXW per item <sup>2</sup> | Total sales and other taxes payable <sup>3</sup> if Contract is awarded |
|----------|--|-------------------|------------------|--|----------|--------------------------------------|---------------------------------------|---|
| (1)      | (2)                                    | (3)               | (4)              | (5)  | (6)      | (7)                                  | (8)=(6)x(7)                           | (9)   |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |  |          |                                      |                                       |   |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Sound Velocity Calibrator              |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Differential Global Positioning System |                   |                  |  | 1        |                                      |                                       |   |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |  | 2        |                                      |                                       |   |
| 5.       | Bathymetry Software                    |                   |                  |  | 3 sets   |                                      |                                       |   |
|          | Sub Total                              |                   |                  |  |          |                                      |                                       |   |
| <b>B</b> | <b>Survey Boat and Accessories</b>     |                   |                  |  |          |                                      |                                       |   |
| 1.       | Survey Boat                            |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Boat Trailer                           |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Outboard Engine                        |                   |                  |  | 2        |                                      |                                       |   |
| 4.       | Voice Radio (set)                      |                   |                  |  | 1        |                                      |                                       |   |

<sup>1</sup> Currencies to be used in accordance with the Instruction to Bidders. The EXW unit price shall include customs duties and sales and other taxes already paid or payable on the components used in the production of the items, or the customs duties and sales and other taxes paid on previously imported items. The factors should not be entered separately.

<sup>2</sup> In case of discrepancy between unit price and total, the unit price shall prevail. In case of discrepancy between subtotals and the total, the subtotal shall prevail

<sup>3</sup> Specify according to the Instruction to Bidders and the related provisions in the Bid Data Sheet.



|          |                            |  |  |  |   |         |  |  |
|----------|----------------------------|--|--|--|---|---------|--|--|
|          | Sub Total                  |  |  |  |   |         |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b> |  |  |  |   |         |  |  |
| 1.       | Battery Charger            |  |  |  | 2 |         |  |  |
| 2.       | Generator                  |  |  |  | 2 |         |  |  |
| 3.       | UPS                        |  |  |  | 1 |         |  |  |
| 4.       | PC                         |  |  |  | 2 |         |  |  |
| 5.       | CD Recorder                |  |  |  | 1 |         |  |  |
| 6.       | Plotter                    |  |  |  | 1 |         |  |  |
| 7.       | Printer                    |  |  |  | 1 |         |  |  |
|          | Sub Total                  |  |  |  |   |         |  |  |
|          | <b>TOTAL</b>               |  |  |  |   | One Set |  |  |

*The form should be filled according to the Schedule of Requirements*

Signature of the Bidder \_\_\_\_\_

**Consignee: CWPRS (Pune)**

**Schedule 2.2. Products offered from India Price Schedule [10.2 (b) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply and installation | Quantity | Unit price EXW <sup>1</sup> per item | Total price EXW per item <sup>2</sup> | Total sales and other taxes payable <sup>3</sup> if Contract is awarded |
|----------|--|-------------------|------------------|--|----------|--------------------------------------|---------------------------------------|---|
| (1)      | (2)                                    | (3)               | (4)              | (5)  | (6)      | (7)                                  | (8)=(6)x(7)                           | (9)   |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |  |          |                                      |                                       |   |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Sound Velocity Calibrator              |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Differential Global Positioning System |                   |                  |  | 1        |                                      |                                       |   |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |  | 2        |                                      |                                       |   |
| 5.       | Bathymetry Software                    |                   |                  |  | 3 sets   |                                      |                                       |   |
|          | Sub Total                              |                   |                  |  |          |                                      |                                       |   |
| <b>B</b> | <b>Survey Boat and Accessories</b>     |                   |                  |  |          |                                      |                                       |   |
| 1.       | Survey Boat                            |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Boat Trailer                           |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Outboard Engine                        |                   |                  |  | 2        |                                      |                                       |   |
| 4.       | Voice Radio (set)                      |                   |                  |  | 1        |                                      |                                       |   |

<sup>1</sup> Currencies to be used in accordance with the Instruction to Bidders. The EXW unit price shall include customs duties and sales and other taxes already paid or payable on the components used in the production of the items, or the customs duties and sales and other taxes paid on previously imported items. The factors should not be entered separately.

<sup>2</sup> In case of discrepancy between unit price and total, the unit price shall prevail. In case of discrepancy between subtotals and the total, the subtotal shall prevail

<sup>3</sup> Specify according to the Instruction to Bidders and the related provisions in the Bid Data Sheet.

|          |                            |  |  |  |   |         |  |  |
|----------|----------------------------|--|--|--|---|---------|--|--|
|          | Sub Total                  |  |  |  |   |         |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b> |  |  |  |   |         |  |  |
| 1.       | Battery Charger            |  |  |  | 2 |         |  |  |
| 2.       | Generator                  |  |  |  | 2 |         |  |  |
| 3.       | UPS                        |  |  |  | 1 |         |  |  |
| 4.       | PC                         |  |  |  | 2 |         |  |  |
| 5.       | CD Recorder                |  |  |  | 1 |         |  |  |
| 6.       | Plotter                    |  |  |  | 1 |         |  |  |
| 7.       | Printer                    |  |  |  | 1 |         |  |  |
|          | Sub Total                  |  |  |  |   |         |  |  |
|          | <b>TOTAL</b>               |  |  |  |   | One Set |  |  |

*The form should be filled according to the Schedule of Requirements*

Signature of the Bidder \_\_\_\_\_

**Consignee state: Andhra Pradesh**

**Schedule 2.2. Products offered from India Price Schedule [10.2 (b) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply and installation | Quantity | Unit price EXW <sup>1</sup> per item | Total price EXW per item <sup>2</sup> | Total sales and other taxes payable <sup>3</sup> if Contract is awarded |
|----------|--|-------------------|------------------|--|----------|--------------------------------------|---------------------------------------|---|
| (1)      | (2)                                    | (3)               | (4)              | (5)  | (6)      | (7)                                  | (8)=(6)x(7)                           | (9)   |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |  |          |                                      |                                       |   |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |  | 2        |                                      |                                       |   |
| 2.       | Sound Velocity Calibrator              |                   |                  |  | 2        |                                      |                                       |   |
| 3.       | Differential Global Positioning System |                   |                  |  | 2        |                                      |                                       |   |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |  | 4        |                                      |                                       |   |
| 5.       | Bathymetry software                    |                   |                  |  | 6 sets   |                                      |                                       |   |
|          | Sub Total                              |                   |                  |  |          |                                      |                                       |   |
| <b>B</b> | <b>Survey Boat</b>                     |                   |                  |  |          |                                      |                                       |   |
| 1.       | Survey Boat                            |                   |                  |  | 2        |                                      |                                       |   |
| 2.       | Boat Trailer                           |                   |                  |  | 2        |                                      |                                       |   |
| 3.       | Outboard Engine                        |                   |                  |  | 4        |                                      |                                       |   |
| 4.       | Voice Radio (set)                      |                   |                  |  | 2        |                                      |                                       |   |

<sup>1</sup> Currencies to be used in accordance with the Instruction to Bidders. The EXW unit price shall include customs duties and sales and other taxes already paid or payable on the components used in the production of the items, or the customs duties and sales and other taxes paid on previously imported items. The factors should not be entered separately.

<sup>2</sup> In case of discrepancy between unit price and total, the unit price shall prevail. In case of discrepancy between subtotals and the total, the subtotal shall prevail

<sup>3</sup> Specify according to the Instruction to Bidders and the related provisions in the Bid Data Sheet.

|          |                            |  |  |  |   |          |  |  |
|----------|----------------------------|--|--|--|---|----------|--|--|
|          | Sub Total                  |  |  |  |   |          |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b> |  |  |  |   |          |  |  |
| 1.       | Battery Charger            |  |  |  | 4 |          |  |  |
| 2.       | Generator                  |  |  |  | 4 |          |  |  |
| 3.       | UPS                        |  |  |  | 2 |          |  |  |
| 4.       | PC                         |  |  |  | 4 |          |  |  |
| 5.       | CD Recorder                |  |  |  | 2 |          |  |  |
| 6.       | Plotter                    |  |  |  | 2 |          |  |  |
| 7.       | Printer                    |  |  |  | 2 |          |  |  |
|          | Sub Total                  |  |  |  |   |          |  |  |
|          | <b>TOTALS</b>              |  |  |  |   | Two sets |  |  |

*The form should be filled according to the Schedule of Requirements*

Signature of the Bidder \_\_\_\_\_

**Consignee state: Tamil Nadu**

**Schedule 2.2. Products offered from India Price Schedule [10.2 (b) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply and installation | Quantity | Unit price EXW <sup>1</sup> per item | Total price EXW per item <sup>2</sup> | Total sales and other taxes payable <sup>3</sup> if Contract is awarded |
|----------|--|-------------------|------------------|--|----------|--------------------------------------|---------------------------------------|---|
| (1)      | (2)                                    | (3)               | (4)              | (5)  | (6)      | (7)                                  | (8)=(6)x(7)                           | (9)   |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |  |          |                                      |                                       |   |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Sound Velocity Calibrator              |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Differential Global Positioning System |                   |                  |  | 1        |                                      |                                       |   |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |  | 2        |                                      |                                       |   |
| 5.       | Bathymetry Software                    |                   |                  |  | 3 sets   |                                      |                                       |   |
|          | Sub Total                              |                   |                  |  |          |                                      |                                       |   |
| <b>B</b> | <b>Survey Boat and Accessories</b>     |                   |                  |  |          |                                      |                                       |   |
| 1.       | Survey Boat                            |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Boat Trailer                           |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Outboard Engine                        |                   |                  |  | 2        |                                      |                                       |   |
| 4.       | Voice Radio (set)                      |                   |                  |  | 1        |                                      |                                       |   |

<sup>1</sup> Currencies to be used in accordance with the Instruction to Bidders. The EXW unit price shall include customs duties and sales and other taxes already paid or payable on the components used in the production of the items, or the customs duties and sales and other taxes paid on previously imported items. The factors should not be entered separately.

<sup>2</sup> In case of discrepancy between unit price and total, the unit price shall prevail. In case of discrepancy between subtotals and the total, the subtotal shall prevail

<sup>3</sup> Specify according to the Instruction to Bidders and the related provisions in the Bid Data Sheet.

|          |                            |  |  |  |   |         |  |  |
|----------|----------------------------|--|--|--|---|---------|--|--|
|          | Sub Total                  |  |  |  |   |         |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b> |  |  |  |   |         |  |  |
| 1.       | Battery Charger            |  |  |  | 2 |         |  |  |
| 2.       | Generator                  |  |  |  | 2 |         |  |  |
| 3.       | UPS                        |  |  |  | 1 |         |  |  |
| 4.       | PC                         |  |  |  | 2 |         |  |  |
| 5.       | CD Recorder                |  |  |  | 1 |         |  |  |
| 6.       | Plotter                    |  |  |  | 1 |         |  |  |
| 7.       | Printer                    |  |  |  | 1 |         |  |  |
|          | Sub Total                  |  |  |  |   |         |  |  |
|          | <b>TOTAL</b>               |  |  |  |   | One Set |  |  |

*The form should be filled according to the Schedule of Requirements*

Signature of the Bidder \_\_\_\_\_

Consignee state: Karnataka

**Schedule 2.2. Products offered from India Price Schedule [10.2 (b) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply and installation | Quantity | Unit price EXW <sup>1</sup> per item | Total price EXW per item <sup>2</sup> | Total sales and other taxes payable <sup>3</sup> if Contract is awarded |
|----------|--|-------------------|------------------|--|----------|--------------------------------------|---------------------------------------|---|
| (1)      | (2)                                    | (3)               | (4)              | (5)  | (6)      | (7)                                  | (8)=(6)x(7)                           | (9)   |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |  |          |                                      |                                       |   |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Sound Velocity Calibrator              |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Differential Global Positioning System |                   |                  |  | 1        |                                      |                                       |   |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |  | 2        |                                      |                                       |   |
| 5.       | Bathymetry Software                    |                   |                  |  | 3 sets   |                                      |                                       |   |
|          | Sub Total                              |                   |                  |  |          |                                      |                                       |   |
| <b>B</b> | <b>Survey Boat and Accessories</b>     |                   |                  |  |          |                                      |                                       |   |
| 1.       | Survey Boat                            |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Boat Trailer                           |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Outboard Engine                        |                   |                  |  | 2        |                                      |                                       |   |
| 4.       | Voice Radio (set)                      |                   |                  |  | 1        |                                      |                                       |   |

<sup>1</sup> Currencies to be used in accordance with the Instruction to Bidders. The EXW unit price shall include customs duties and sales and other taxes already paid or payable on the components used in the production of the items, or the customs duties and sales and other taxes paid on previously imported items. The factors should not be entered separately.

<sup>2</sup> In case of discrepancy between unit price and total, the unit price shall prevail. In case of discrepancy between subtotals and the total, the subtotal shall prevail

<sup>3</sup> Specify according to the Instruction to Bidders and the related provisions in the Bid Data Sheet.



|          |                            |  |  |  |   |         |  |  |
|----------|----------------------------|--|--|--|---|---------|--|--|
|          | Sub Total                  |  |  |  |   |         |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b> |  |  |  |   |         |  |  |
| 1.       | Battery Charger            |  |  |  | 2 |         |  |  |
| 2.       | Generator                  |  |  |  | 2 |         |  |  |
| 3.       | UPS                        |  |  |  | 1 |         |  |  |
| 4.       | PC                         |  |  |  | 2 |         |  |  |
| 5.       | CD Recorder                |  |  |  | 1 |         |  |  |
| 6.       | Plotter                    |  |  |  | 1 |         |  |  |
| 7.       | Printer                    |  |  |  | 1 |         |  |  |
|          | Sub Total                  |  |  |  |   |         |  |  |
|          | <b>TOTAL</b>               |  |  |  |   | One Set |  |  |

*The form should be filled according to the Schedule of Requirements*

Signature of the Bidder \_\_\_\_\_

**Consignee state: Kerala**

**Schedule 2.2. Products offered from India Price Schedule [10.2 (b) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply and installation | Quantity | Unit price EXW <sup>1</sup> per item | Total price EXW per item <sup>2</sup> | Total sales and other taxes payable <sup>3</sup> if Contract is awarded |
|----------|--|-------------------|------------------|--|----------|--------------------------------------|---------------------------------------|---|
| (1)      | (2)                                    | (3)               | (4)              | (5)  | (6)      | (7)                                  | (8)=(6)x(7)                           | (9)   |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |  |          |                                      |                                       |   |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Sound Velocity Calibrator              |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Differential Global Positioning System |                   |                  |  | 1        |                                      |                                       |   |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |  | 2        |                                      |                                       |   |
| 5.       | Bathymetry Software                    |                   |                  |  | 3 sets   |                                      |                                       |   |
|          | Sub Total                              |                   |                  |  |          |                                      |                                       |   |
| <b>B</b> | <b>Survey Boat and Accessories</b>     |                   |                  |  |          |                                      |                                       |   |
| 1.       | Survey Boat                            |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Boat Trailer                           |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Outboard Engine                        |                   |                  |  | 2        |                                      |                                       |   |
| 4.       | Voice Radio (set)                      |                   |                  |  | 1        |                                      |                                       |   |

<sup>1</sup> Currencies to be used in accordance with the Instruction to Bidders. The EXW unit price shall include customs duties and sales and other taxes already paid or payable on the components used in the production of the items, or the customs duties and sales and other taxes paid on previously imported items. The factors should not be entered separately.

<sup>2</sup> In case of discrepancy between unit price and total, the unit price shall prevail. In case of discrepancy between subtotals and the total, the subtotal shall prevail

<sup>3</sup> Specify according to the Instruction to Bidders and the related provisions in the Bid Data Sheet.

|          |                            |  |  |  |   |         |  |  |
|----------|----------------------------|--|--|--|---|---------|--|--|
|          | Sub Total                  |  |  |  |   |         |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b> |  |  |  |   |         |  |  |
| 1.       | Battery Charger            |  |  |  | 2 |         |  |  |
| 2.       | Generator                  |  |  |  | 2 |         |  |  |
| 3.       | UPS                        |  |  |  | 1 |         |  |  |
| 4.       | PC                         |  |  |  | 2 |         |  |  |
| 5.       | CD Recorder                |  |  |  | 1 |         |  |  |
| 6.       | Plotter                    |  |  |  | 1 |         |  |  |
| 7.       | Printer                    |  |  |  | 1 |         |  |  |
|          | Sub Total                  |  |  |  |   |         |  |  |
|          | <b>TOTAL</b>               |  |  |  |   | One Set |  |  |

*The form should be filled according to the Schedule of Requirements*

Signature of the Bidder \_\_\_\_\_

**Consignee state: Madhya Pradesh**

**Schedule 2.2. Products offered from India Price Schedule [10.2 (b) of ITB]  
(excluding inland transportation)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Product Description                    | Country of Origin | Product Producer | Partner or Subcontractor responsible for Supply and installation | Quantity | Unit price EXW <sup>1</sup> per item | Total price EXW per item <sup>2</sup> | Total sales and other taxes payable <sup>3</sup> if Contract is awarded |
|----------|--|-------------------|------------------|--|----------|--------------------------------------|---------------------------------------|---|
| (1)      | (2)                                    | (3)               | (4)              | (5)  | (6)      | (7)                                  | (8)=(6)x(7)                           | (9)   |
| <b>A</b> | <b>Integrated Bathymetric System</b>   |                   |                  |  |          |                                      |                                       |   |
| 1.       | Hydrographic Echo-Sounder:             |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Sound Velocity Calibrator              |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Differential Global Positioning System |                   |                  |  | 1        |                                      |                                       |   |
| 4.       | Data Collection Computer (Laptop)      |                   |                  |  | 2        |                                      |                                       |   |
| 5.       | Bathymetry Software                    |                   |                  |  | 3 sets   |                                      |                                       |   |
|          | Sub Total                              |                   |                  |  |          |                                      |                                       |   |
| <b>B</b> | <b>Survey Boat and Accessories</b>     |                   |                  |  |          |                                      |                                       |   |
| 1.       | Survey Boat                            |                   |                  |  | 1        |                                      |                                       |   |
| 2.       | Boat Trailer                           |                   |                  |  | 1        |                                      |                                       |   |
| 3.       | Outboard Engine                        |                   |                  |  | 2        |                                      |                                       |   |
| 4.       | Voice Radio (set)                      |                   |                  |  | 1        |                                      |                                       |   |

<sup>1</sup> Currencies to be used in accordance with the Instruction to Bidders. The EXW unit price shall include customs duties and sales and other taxes already paid or payable on the components used in the production of the items, or the customs duties and sales and other taxes paid on previously imported items. The factors should not be entered separately.

<sup>2</sup> In case of discrepancy between unit price and total, the unit price shall prevail. In case of discrepancy between subtotals and the total, the subtotal shall prevail

<sup>3</sup> Specify according to the Instruction to Bidders and the related provisions in the Bid Data Sheet.

|          |                            |  |  |  |   |         |  |  |
|----------|----------------------------|--|--|--|---|---------|--|--|
|          | Sub Total                  |  |  |  |   |         |  |  |
| <b>C</b> | <b>Auxiliary Equipment</b> |  |  |  |   |         |  |  |
| 1.       | Battery Charger            |  |  |  | 2 |         |  |  |
| 2.       | Generator                  |  |  |  | 2 |         |  |  |
| 3.       | UPS                        |  |  |  | 1 |         |  |  |
| 4.       | PC                         |  |  |  | 2 |         |  |  |
| 5.       | CD Recorder                |  |  |  | 1 |         |  |  |
| 6.       | Plotter                    |  |  |  | 1 |         |  |  |
| 7.       | Printer                    |  |  |  | 1 |         |  |  |
|          | Sub Total                  |  |  |  |   |         |  |  |
|          | <b>TOTAL</b>               |  |  |  |   | One Set |  |  |

*The form should be filled according to the Schedule of Requirements*

Signature of the Bidder \_\_\_\_\_

**Consignee state: Gujarat**

**Schedule 2.3. Services Price Schedule (prior to Maintenance)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Service Description             | Product Producer | Partner or Subcontractor responsible for training | Quantity (mandays) | Unit price per day | Total price |
|----------|---------------------------------|------------------|---|--------------------|--------------------|-------------|
| (1)      | (2)                             | (3)              | (4)   | (5)                | (6)                | (7)=(5)x(6) |
| 1.       | Training<br>Subtotal            |                  |   |                    |                    |             |
| 2.       | Product Support Services        |                  |   |                    |                    |             |
| (a)      | Technical Support<br>Subtotal   |                  |   |                    |                    |             |
| (b)      | Operational Support<br>Subtotal |                  |   |                    |                    |             |
|          | <b>TOTALS</b>                   |                  |   |                    |                    |             |

- Note: 1. In case of discrepancy between unit price and total, the unit price shall prevail.  
2. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet.  
3. Service Prices include all taxes payable by the Bidder thereon.

Signature of the Bidder \_\_\_\_\_

Consignee state: Orissa

**Schedule 2.3. Services Price Schedule (prior to Maintenance)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Service Description             | Product Producer | Partner or Subcontractor responsible for training | Quantity (mandays) | Unit price per day | Total price |
|----------|---------------------------------|------------------|---|--------------------|--------------------|-------------|
| (1)      | (2)                             | (3)              | (4)   | (5)                | (6)                | (7)=(5)x(6) |
| 1.       | Training<br>Subtotal            |                  |   |                    |                    |             |
| 2.       | Product Support Services        |                  |   |                    |                    |             |
| (a)      | Technical Support<br>Subtotal   |                  |   |                    |                    |             |
| (b)      | Operational Support<br>Subtotal |                  |   |                    |                    |             |
|          | <b>TOTALS</b>                   |                  |   |                    |                    |             |

- Note: 1. In case of discrepancy between unit price and total, the unit price shall prevail.  
2. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet.  
3. Service Prices include all taxes payable by the Bidder thereon.

Signature of the Bidder \_\_\_\_\_

**Consignee state: Maharashtra**

**Schedule 2.3. Services Price Schedule (prior to Maintenance)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Service Description             | Product Producer | Partner or Subcontractor responsible for training | Quantity (mandays) | Unit price per day | Total price |
|----------|---------------------------------|------------------|---|--------------------|--------------------|-------------|
| (1)      | (2)                             | (3)              | (4)   | (5)                | (6)                | (7)=(5)x(6) |
| 1.       | Training<br>Subtotal            |                  |   |                    |                    |             |
| 2.       | Product Support Services        |                  |   |                    |                    |             |
| (a)      | Technical Support<br>Subtotal   |                  |   |                    |                    |             |
| (b)      | Operational Support<br>Subtotal |                  |   |                    |                    |             |
|          | <b>TOTALS</b>                   |                  |   |                    |                    |             |

- Note: 1. In case of discrepancy between unit price and total, the unit price shall prevail.  
2. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet.  
3. Service Prices include all taxes payable by the Bidder thereon.

Signature of the Bidder \_\_\_\_\_



Consignee state: CWPRS (Pune)

**Schedule 2.3. Services Price Schedule (prior to Maintenance)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Service Description             | Product Producer | Partner or Subcontractor responsible for training | Quantity (mandays) | Unit price per day | Total price |
|----------|---------------------------------|------------------|---|--------------------|--------------------|-------------|
| (1)      | (2)                             | (3)              | (4)   | (5)                | (6)                | (7)=(5)x(6) |
| 1.       | Training<br>Subtotal            |                  |   |                    |                    |             |
| 2.       | Product Support Services        |                  |   |                    |                    |             |
| (a)      | Technical Support<br>Subtotal   |                  |   |                    |                    |             |
| (b)      | Operational Support<br>Subtotal |                  |   |                    |                    |             |
|          | <b>TOTALS</b>                   |                  |   |                    |                    |             |

- Note: 1. In case of discrepancy between unit price and total, the unit price shall prevail.  
4. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet.  
5. Service Prices include all taxes payable by the Bidder thereon.

Signature of the Bidder \_\_\_\_\_

Consignee state: Andhra Pradesh

**Schedule 2.3. Services Price Schedule (prior to Maintenance)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Service Description             | Product Producer | Partner or Subcontractor responsible for training | Quantity (mandays) | Unit price per day | Total price |
|----------|---------------------------------|------------------|---|--------------------|--------------------|-------------|
| (1)      | (2)                             | (3)              | (4)   | (5)                | (6)                | (7)=(5)x(6) |
| 1.       | Training<br>Subtotal            |                  |   |                    |                    |             |
| 2.       | Product Support Services        |                  |   |                    |                    |             |
| (a)      | Technical Support<br>Subtotal   |                  |   |                    |                    |             |
| (b)      | Operational Support<br>Subtotal |                  |   |                    |                    |             |
|          | TOTALS                          |                  |   |                    |                    |             |

- Note: 1. In case of discrepancy between unit price and total, the unit price shall prevail.  
2. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet.  
3. Service Prices include all taxes payable by the Bidder thereon.

Signature of the Bidder \_\_\_\_\_

**Schedule 2.3. Services Price Schedule (prior to Maintenance)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Service Description             | Product Producer | Partner or Subcontractor responsible for training | Quantity (mandays) | Unit price per day | Total price |
|----------|---------------------------------|------------------|---|--------------------|--------------------|-------------|
| (1)      | (2)                             | (3)              | (4)   | (5)                | (6)                | (7)=(5)x(6) |
| 1.       | Training<br>Subtotal            |                  |   |                    |                    |             |
| 2.       | Product Support Services        |                  |   |                    |                    |             |
| (a)      | Technical Support<br>Subtotal   |                  |   |                    |                    |             |
| (b)      | Operational Support<br>Subtotal |                  |   |                    |                    |             |
|          | TOTALS                          |                  |   |                    |                    |             |

- Note:
1. In case of discrepancy between unit price and total, the unit price shall prevail.
  2. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet.
  3. Service Prices include all taxes payable by the Bidder thereon.

Signature of the Bidder \_\_\_\_\_

**Consignee state: Karnataka**

**Schedule 2.3. Services Price Schedule (prior to Maintenance)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Service Description             | Product Producer | Partner or Subcontractor responsible for training | Quantity (mandays) | Unit price per day | Total price |
|----------|---------------------------------|------------------|---|--------------------|--------------------|-------------|
| (1)      | (2)                             | (3)              | (4)   | (5)                | (6)                | (7)=(5)x(6) |
| 1.       | Training<br>Subtotal            |                  |   |                    |                    |             |
| 2.       | Product Support Services        |                  |   |                    |                    |             |
| (a)      | Technical Support<br>Subtotal   |                  |   |                    |                    |             |
| (b)      | Operational Support<br>Subtotal |                  |   |                    |                    |             |
|          | TOTALS                          |                  |   |                    |                    |             |

- Note:
1. In case of discrepancy between unit price and total, the unit price shall prevail.
  2. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet.
  3. Service Prices include all taxes payable by the Bidder thereon.

Signature of the Bidder \_\_\_\_\_

**Consignee state: Kerala**

**Schedule 2.3. Services Price Schedule (prior to Maintenance)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Service Description             | Product Producer | Partner or Subcontractor responsible for training | Quantity (mandays) | Unit price per day | Total price |
|----------|---------------------------------|------------------|---|--------------------|--------------------|-------------|
| (1)      | (2)                             | (3)              | (4)   | (5)                | (6)                | (7)=(5)x(6) |
| 1.       | Training<br>Subtotal            |                  |   |                    |                    |             |
| 2.       | Product Support Services        |                  |   |                    |                    |             |
| (a)      | Technical Support<br>Subtotal   |                  |   |                    |                    |             |
| (b)      | Operational Support<br>Subtotal |                  |   |                    |                    |             |
|          | TOTALS                          |                  |   |                    |                    |             |

- Note: 1. In case of discrepancy between unit price and total, the unit price shall prevail.  
2. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet.  
3. Service Prices include all taxes payable by the Bidder thereon.

Signature of the Bidder \_\_\_\_\_

**Consignee state: Madhya Pradesh**

**Schedule 2.3. Services Price Schedule (prior to Maintenance)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No. | Service Description             | Product Producer | Partner or Subcontractor responsible for training | Quantity (mandays) | Unit price per day | Total price |
|----------|---------------------------------|------------------|---|--------------------|--------------------|-------------|
| (1)      | (2)                             | (3)              | (4)   | (5)                | (6)                | (7)=(5)x(6) |
| 1.       | Training<br>Subtotal            |                  |   |                    |                    |             |
| 2.       | Product Support Services        |                  |   |                    |                    |             |
| (a)      | Technical Support<br>Subtotal   |                  |   |                    |                    |             |
| (b)      | Operational Support<br>Subtotal |                  |   |                    |                    |             |
|          | TOTALS                          |                  |   |                    |                    |             |

- Note:
1. In case of discrepancy between unit price and total, the unit price shall prevail.
  2. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet.
  3. Service Prices include all taxes payable by the Bidder thereon.

Signature of the Bidder \_\_\_\_\_

Consignee state: Gujarat

Schedule 2.4. Inland Delivery Price Schedule

Site of delivery: \_\_\_\_\_

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No.   | Product Description                    | Unit price | Total price |
|--|--|------------|-------------|
|  |  | Rs.        | Rs.         |
| <b>Foreign Products (CIP) Named place of destination</b> |  |            |             |
| <b>A. Integrated Bathymetric System</b>                  |  |            |             |
| 1.   | Hydrographic Echo Sounder              |            |             |
| 2.   | Sound Velocity Calibrator              |            |             |
| 3.   | Differential Global Positioning System |            |             |
| 4.   | Data Collection Computer (Laptop)      |            |             |
| 5.   | Bathymetry Software                    |            |             |
|  | Sub Total                              |            |             |
| <b>B. Survey Boat and Accessories</b>                    |  |            |             |
| 1.   | Survey Boat                            |            |             |
| 2.   | Boat Trailer                           |            |             |
| 3.   | Outboard Engine                        |            |             |
| 4.   | Voice Radio (set)                      |            |             |
|  | Sub Total                              |            |             |
| <b>C. Auxilliary Equipment</b>                           |  |            |             |
| 1.   | Battery Charger                        |            |             |
| 2.   | Generator                              |            |             |
| 3.   | UPS                                    |            |             |
| 4.   | PC                                     |            |             |
| 5.   | CD Recorder                            |            |             |
| 6.   | Plotter                                |            |             |
| 7.   | Printers                               |            |             |
|  | Sub Total                              |            |             |

| <b>Locally Supplied Products (EXW)</b> |  |  |  |
|--|--|--|--|
| <b>A.</b>                              | <b>Integrated Bathymetric System</b>   |  |  |
| 1.                                     | Hydrographic Echo Sounder              |  |  |
| 2.                                     | Sound Velocity Calibrator              |  |  |
| 3.                                     | Differential Global Positioning System |  |  |
| 4.                                     | Data Collection Computer (Laptop)      |  |  |
| 5.                                     | Bathymetry Software                    |  |  |
|  | Sub Total                              |  |  |
| <b>B.</b>                              | <b>Survey Boat and Accessories</b>     |  |  |
| 1.                                     | Survey Boat                            |  |  |
| 2.                                     | Boat Trailer                           |  |  |
| 3.                                     | Outboard Engine                        |  |  |
| 4.                                     | Voice Radio (set)                      |  |  |
|  | Sub Total                              |  |  |
| <b>C.</b>                              | <b>Auxilliary Equipment</b>            |  |  |
| 1.                                     | Battery Charger                        |  |  |
| 2.                                     | Generator                              |  |  |
| 3.                                     | UPS                                    |  |  |
| 4.                                     | PC                                     |  |  |
| 5.                                     | CD Recorder                            |  |  |
| 6.                                     | Plotter                                |  |  |
| 7.                                     | Printers                               |  |  |
|  | Sub Total                              |  |  |
| <b>TOTALS</b>                          |  |  |  |

- Note: 1. Specify according to the Instructions to Bidders and the related provisions in the Bid Data Sheet for all products quoted EXW or CIP named place of destination.
2. In case of discrepancy between unit price and total, the unit price shall prevail. Similarly, subtotals shall prevail over totals.

Signature of the Bidder \_\_\_\_\_



Consignee state: Orissa

**Schedule 2.4. Inland Delivery Price Schedule**

Site of delivery: \_\_\_\_\_

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No.   | Product Description                    | Unit price | Total price |
|--|--|------------|-------------|
|  |  | Rs.        | Rs.         |
| <b>Foreign Products (CIP) Named place of destination</b> |  |            |             |
| <b>A.</b>  | <b>Integrated Bathymetric System</b>   |            |             |
| 1.   | Hydrographic Echo Sounder              |            |             |
| 2.   | Sound Velocity Calibrator              |            |             |
| 3.   | Differential Global Positioning System |            |             |
| 4.   | Data Collection Computer (Laptop)      |            |             |
| 5.   | Bathymetry Software                    |            |             |
|  | Sub Total                              |            |             |
| <b>B.</b>  | <b>Survey Boat and Accessories</b>     |            |             |
| 1.   | Survey Boat                            |            |             |
| 2.   | Boat Trailer                           |            |             |
| 3.   | Outboard Engine                        |            |             |
| 4.   | Voice Radio (set)                      |            |             |
|  | Sub Total                              |            |             |
| <b>C.</b>  | <b>Auxilliary Equipment</b>            |            |             |
| 1.   | Battery Charger                        |            |             |
| 2.   | Generator                              |            |             |
| 3.   | UPS                                    |            |             |
| 4.   | PC                                     |            |             |
| 5.   | CD Recorder                            |            |             |
| 6.   | Plotter                                |            |             |
| 7.   | Printers                               |            |             |
|  | Sub Total                              |            |             |

| <b>Locally Supplied Products (EXW)</b> |  |  |  |
|--|--|--|--|
| <b>A.</b>                              | <b>Integrated Bathymetric System</b>   |  |  |
| 1.                                     | Hydrographic Echo Sounder              |  |  |
| 2.                                     | Sound Velocity Calibrator              |  |  |
| 3.                                     | Differential Global Positioning System |  |  |
| 4.                                     | Data Collection Computer (Laptop)      |  |  |
| 5.                                     | Bathymetry Software                    |  |  |
|  | Sub Total                              |  |  |
| <b>B.</b>                              | <b>Survey Boat and Accessories</b>     |  |  |
| 1.                                     | Survey Boat                            |  |  |
| 2.                                     | Boat Trailer                           |  |  |
| 3.                                     | Outboard Engine                        |  |  |
| 4.                                     | Voice Radio (set)                      |  |  |
|  | Sub Total                              |  |  |
| <b>C.</b>                              | <b>Auxilliary Equipment</b>            |  |  |
| 1.                                     | Battery Charger                        |  |  |
| 2.                                     | Generator                              |  |  |
| 3.                                     | UPS                                    |  |  |
| 4.                                     | PC                                     |  |  |
| 5.                                     | CD Recorder                            |  |  |
| 6.                                     | Plotter                                |  |  |
| 7.                                     | Printers                               |  |  |
|  | Sub Total                              |  |  |
|  | <b>TOTALS</b>                          |  |  |

- Note: 1. Specify according to the Instructions to Bidders and the related provisions in the Bid Data Sheet for all products quoted EXW or CIP named place of destination.
2. In case of discrepancy between unit price and total, the unit price shall prevail. Similarly, subtotals shall prevail over totals.

Signature of the Bidder \_\_\_\_\_

Consignee state: Maharashtra

Schedule 2.4. Inland Delivery Price Schedule

Site of delivery: \_\_\_\_\_

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No.   | Product Description                    | Unit price | Total price |
|--|--|------------|-------------|
|  |  | Rs.        | Rs.         |
| <b>Foreign Products (CIP) Named place of destination</b> |  |            |             |
| <b>A.</b>  | <b>Integrated Bathymetric System</b>   |            |             |
| 1.   | Hydrographic Echo Sounder              |            |             |
| 2.   | Sound Velocity Calibrator              |            |             |
| 3.   | Differential Global Positioning System |            |             |
| 4.   | Data Collection Computer (Laptop)      |            |             |
| 5.   | Bathymetry Software                    |            |             |
|  | Sub Total                              |            |             |
| <b>B.</b>  | <b>Survey Boat and Accessories</b>     |            |             |
| 1.   | Survey Boat                            |            |             |
| 2.   | Boat Trailer                           |            |             |
| 3.   | Outboard Engine                        |            |             |
| 4.   | Voice Radio (set)                      |            |             |
|  | Sub Total                              |            |             |
| <b>C.</b>  | <b>Auxilliary Equipment</b>            |            |             |
| 1.   | Battery Charger                        |            |             |
| 2.   | Generator                              |            |             |
| 3.   | UPS                                    |            |             |
| 4.   | PC                                     |            |             |
| 5.   | CD Recorder                            |            |             |
| 6.   | Plotter                                |            |             |
| 7.   | Printers                               |            |             |
|  | Sub Total                              |            |             |

| <b>Locally Supplied Products (EXW)</b> |  |  |  |
|--|--|--|--|
| <b>A.</b>                              | <b>Integrated Bathymetric System</b>   |  |  |
| 1.                                     | Hydrographic Echo Sounder              |  |  |
| 2.                                     | Sound Velocity Calibrator              |  |  |
| 3.                                     | Differential Global Positioning System |  |  |
| 4.                                     | Data Collection Computer (Laptop)      |  |  |
| 5.                                     | Bathymetry Software                    |  |  |
|  | Sub Total                              |  |  |
| <b>B.</b>                              | <b>Survey Boat and Accessories</b>     |  |  |
| 1.                                     | Survey Boat                            |  |  |
| 2.                                     | Boat Trailer                           |  |  |
| 3.                                     | Outboard Engine                        |  |  |
| 4.                                     | Voice Radio (set)                      |  |  |
|  | Sub Total                              |  |  |
| <b>C.</b>                              | <b>Auxilliary Equipment</b>            |  |  |
| 1.                                     | Battery Charger                        |  |  |
| 2.                                     | Generator                              |  |  |
| 3.                                     | UPS                                    |  |  |
| 4.                                     | PC                                     |  |  |
| 5.                                     | CD Recorder                            |  |  |
| 6.                                     | Plotter                                |  |  |
| 7.                                     | Printers                               |  |  |
|  | Sub Total                              |  |  |
|  | <b>TOTALS</b>                          |  |  |

- Note: 1. Specify according to the Instructions to Bidders and the related provisions in the Bid Data Sheet for all products quoted EXW or CIP named place of destination.
2. In case of discrepancy between unit price and total, the unit price shall prevail. Similarly, subtotals shall prevail over totals.

Signature of the Bidder \_\_\_\_\_

Schedule 2.4. Inland Delivery Price Schedule  
 Site of delivery: \_\_\_\_\_

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No.   | Product Description                    | Unit price | Total price |
|--|--|------------|-------------|
|  |  | Rs.        | Rs.         |
| <b>Foreign Products (CIP) Named place of destination</b> |  |            |             |
| <b>A.</b>  | <b>Integrated Bathymetric System</b>   |            |             |
| 1.   | Hydrographic Echo Sounder              |            |             |
| 2.   | Sound Velocity Calibrator              |            |             |
| 3.   | Differential Global Positioning System |            |             |
| 4.   | Data Collection Computer (Laptop)      |            |             |
| 5.   | Bathymetry Software                    |            |             |
|  | Sub Total                              |            |             |
| <b>B.</b>  | <b>Survey Boat and Accessories</b>     |            |             |
| 1.   | Survey Boat                            |            |             |
| 2.   | Boat Trailer                           |            |             |
| 3.   | Outboard Engine                        |            |             |
| 4.   | Voice Radio (set)                      |            |             |
|  | Sub Total                              |            |             |
| <b>C.</b>  | <b>Auxilliary Equipment</b>            |            |             |
| 1.   | Battery Charger                        |            |             |
| 2.   | Generator                              |            |             |
| 3.   | UPS                                    |            |             |
| 4.   | PC                                     |            |             |
| 5.   | CD Recorder                            |            |             |
| 6.   | Plotter                                |            |             |
| 7.   | Printers                               |            |             |
|  | Sub Total                              |            |             |

| <b>Locally Supplied Products (EXW)</b> |  |  |  |
|--|--|--|--|
| <b>A.</b>                              | <b>Integrated Bathymetric System</b>   |  |  |
| 1.                                     | Hydrographic Echo Sounder              |  |  |
| 2.                                     | Sound Velocity Calibrator              |  |  |
| 3.                                     | Differential Global Positioning System |  |  |
| 4.                                     | Data Collection Computer (Laptop)      |  |  |
| 5.                                     | Bathymetry Software                    |  |  |
|  | Sub Total                              |  |  |
| <b>B.</b>                              | <b>Survey Boat and Accessories</b>     |  |  |
| 1.                                     | Survey Boat                            |  |  |
| 2.                                     | Boat Trailer                           |  |  |
| 3.                                     | Outboard Engine                        |  |  |
| 4.                                     | Voice Radio (set)                      |  |  |
|  | Sub Total                              |  |  |
| <b>C.</b>                              | <b>Auxilliary Equipment</b>            |  |  |
| 1.                                     | Battery Charger                        |  |  |
| 2.                                     | Generator                              |  |  |
| 3.                                     | UPS                                    |  |  |
| 4.                                     | PC                                     |  |  |
| 5.                                     | CD Recorder                            |  |  |
| 6.                                     | Plotter                                |  |  |
| 7.                                     | Printers                               |  |  |
|  | Sub Total                              |  |  |
|  | <b>TOTALS</b>                          |  |  |

- Note: 1. Specify according to the Instructions to Bidders and the related provisions in the Bid Data Sheet for all products quoted EXW or CIP named place of destination.
2. In case of discrepancy between unit price and total, the unit price shall prevail. Similarly, subtotals shall prevail over totals.

Signature of the Bidder \_\_\_\_\_

Consignee state: Andhra Pradesh

Schedule 2.4. Inland Delivery Price Schedule

Site of delivery: \_\_\_\_\_

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No.   | Product Description                    | Unit price | Total price |
|--|--|------------|-------------|
|  |  | Rs.        | Rs.         |
| <b>Foreign Products (CIP) Named place of destination</b> |  |            |             |
| <b>A.</b>  | <b>Integrated Bathymetric System</b>   |            |             |
| 1.   | Hydrographic Echo Sounder              |            |             |
| 2.   | Sound Velocity Calibrator              |            |             |
| 3.   | Differential Global Positioning System |            |             |
| 4.   | Data Collection Computer (Laptop)      |            |             |
| 5.   | Bathymetry Software                    |            |             |
|  | Sub Total                              |            |             |
| <b>B.</b>  | <b>Survey Boat and Accessories</b>     |            |             |
| 1.   | Survey Boat                            |            |             |
| 2.   | Boat Trailer                           |            |             |
| 3.   | Outboard Engine                        |            |             |
| 4.   | Voice Radio (set)                      |            |             |
|  | Sub Total                              |            |             |
| <b>C.</b>  | <b>Auxilliary Equipment</b>            |            |             |
| 1.   | Battery Charger                        |            |             |
| 2.   | Generator                              |            |             |
| 3.   | UPS                                    |            |             |
| 4.   | PC                                     |            |             |
| 5.   | CD Recorder                            |            |             |
| 6.   | Plotter                                |            |             |
| 7.   | Printers                               |            |             |
|  | Sub Total                              |            |             |

| <b>Locally Supplied Products (EXW)</b> |  |  |  |
|--|--|--|--|
| <b>A.</b>                              | <b>Integrated Bathymetric System</b>   |  |  |
| 1.                                     | Hydrographic Echo Sounder              |  |  |
| 2.                                     | Sound Velocity Calibrator              |  |  |
| 3.                                     | Differential Global Positioning System |  |  |
| 4.                                     | Data Collection Computer (Laptop)      |  |  |
| 5.                                     | Bathymetry Software                    |  |  |
|  | Sub Total                              |  |  |
| <b>B.</b>                              | <b>Survey Boat and Accessories</b>     |  |  |
| 1.                                     | Survey Boat                            |  |  |
| 2.                                     | Boat Trailer                           |  |  |
| 3.                                     | Outboard Engine                        |  |  |
| 4.                                     | Voice Radio (set)                      |  |  |
|  | Sub Total                              |  |  |
| <b>C.</b>                              | <b>Auxilliary Equipment</b>            |  |  |
| 1.                                     | Battery Charger                        |  |  |
| 2.                                     | Generator                              |  |  |
| 3.                                     | UPS                                    |  |  |
| 4.                                     | PC                                     |  |  |
| 5.                                     | CD Recorder                            |  |  |
| 6.                                     | Plotter                                |  |  |
| 7.                                     | Printers                               |  |  |
|  | Sub Total                              |  |  |
| <b>TOTALS</b>                          |  |  |  |

- Note: 1. Specify according to the Instructions to Bidders and the related provisions in the Bid Data Sheet for all products quoted EXW or CIP named place of destination.
2. In case of discrepancy between unit price and total, the unit price shall prevail. Similarly, subtotals shall prevail over totals.

Signature of the Bidder \_\_\_\_\_



Schedule 2.4. Inland Delivery Price Schedule  
 Site of delivery: \_\_\_\_\_

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No.   | Product Description                    | Unit price | Total price |
|--|--|------------|-------------|
|  |  | Rs.        | Rs.         |
| <b>Foreign Products (CIP) Named place of destination</b> |  |            |             |
| <b>A.</b>  | <b>Integrated Bathymetric System</b>   |            |             |
| 1.   | Hydrographic Echo Sounder              |            |             |
| 2.   | Sound Velocity Calibrator              |            |             |
| 3.   | Differential Global Positioning System |            |             |
| 4.   | Data Collection Computer (Laptop)      |            |             |
| 5.   | Bathymetry Software                    |            |             |
|  | Sub Total                              |            |             |
| <b>B.</b>  | <b>Survey Boat and Accessories</b>     |            |             |
| 1.   | Survey Boat                            |            |             |
| 2.   | Boat Trailer                           |            |             |
| 3.   | Outboard Engine                        |            |             |
| 4.   | Voice Radio (set)                      |            |             |
|  | Sub Total                              |            |             |
| <b>C.</b>  | <b>Auxilliary Equipment</b>            |            |             |
| 1.   | Battery Charger                        |            |             |
| 2.   | Generator                              |            |             |
| 3.   | UPS                                    |            |             |
| 4.   | PC                                     |            |             |
| 5.   | CD Recorder                            |            |             |
| 6.   | Plotter                                |            |             |
| 7.   | Printers                               |            |             |
|  | Sub Total                              |            |             |

| <b>Locally Supplied Products (EXW)</b> |  |  |  |
|--|--|--|--|
| <b>A.</b>                              | <b>Integrated Bathymetric System</b>   |  |  |
| 1.                                     | Hydrographic Echo Sounder              |  |  |
| 2.                                     | Sound Velocity Calibrator              |  |  |
| 3.                                     | Differential Global Positioning System |  |  |
| 4.                                     | Data Collection Computer (Laptop)      |  |  |
| 5.                                     | Bathymetry Software                    |  |  |
|  | Sub Total                              |  |  |
| <b>B.</b>                              | <b>Survey Boat and Accessories</b>     |  |  |
| 1.                                     | Survey Boat                            |  |  |
| 2.                                     | Boat Trailer                           |  |  |
| 3.                                     | Outboard Engine                        |  |  |
| 4.                                     | Voice Radio (set)                      |  |  |
|  | Sub Total                              |  |  |
| <b>C.</b>                              | <b>Auxilliary Equipment</b>            |  |  |
| 1.                                     | Battery Charger                        |  |  |
| 2.                                     | Generator                              |  |  |
| 3.                                     | UPS                                    |  |  |
| 4.                                     | PC                                     |  |  |
| 5.                                     | CD Recorder                            |  |  |
| 6.                                     | Plotter                                |  |  |
| 7.                                     | Printers                               |  |  |
|  | Sub Total                              |  |  |
|  | <b>TOTALS</b>                          |  |  |

- Note: 1. Specify according to the Instructions to Bidders and the related provisions in the Bid Data Sheet for all products quoted EXW or CIP named place of destination.
2. In case of discrepancy between unit price and total, the unit price shall prevail. Similarly, subtotals shall prevail over totals.

Signature of the Bidder \_\_\_\_\_

Consignee state: Karnataka

Schedule 2.4. Inland Delivery Price Schedule

Site of delivery: \_\_\_\_\_

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

IFB NO. \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

| Item No.   | Product Description                    | Unit price | Total price |
|--|--|------------|-------------|
|  |  | Rs.        | Rs.         |
| <b>Foreign Products (CIP) Named place of destination</b> |  |            |             |
| <b>A.</b>  | <b>Integrated Bathymetric System</b>   |            |             |
| 1.   | Hydrographic Echo Sounder              |            |             |
| 2.   | Sound Velocity Calibrator              |            |             |
| 3.   | Differential Global Positioning System |            |             |
| 4.   | Data Collection Computer (Laptop)      |            |             |
| 5.   | Bathymetry Software                    |            |             |
|  | Sub Total                              |            |             |
| <b>B.</b>  | <b>Survey Boat and Accessories</b>     |            |             |
| 1.   | Survey Boat                            |            |             |
| 2.   | Boat Trailer                           |            |             |
| 3.   | Outboard Engine                        |            |             |
| 4.   | Voice Radio (set)                      |            |             |
|  | Sub Total                              |            |             |
| <b>C.</b>  | <b>Auxilliary Equipment</b>            |            |             |
| 1.   | Battery Charger                        |            |             |
| 2.   | Generator                              |            |             |
| 3.   | UPS                                    |            |             |
| 4.   | PC                                     |            |             |
| 5.   | CD Recorder                            |            |             |
| 6.   | Plotter                                |            |             |
| 7.   | Printers                               |            |             |
|  | Sub Total                              |            |             |

| <b>Locally Supplied Products (EXW)</b> |  |  |  |
|--|--|--|--|
| <b>A.</b>                              | <b>Integrated Bathymetric System</b>   |  |  |
| 1.                                     | Hydrographic Echo Sounder              |  |  |
| 2.                                     | Sound Velocity Calibrator              |  |  |
| 3.                                     | Differential Global Positioning System |  |  |
| 4.                                     | Data Collection Computer (Laptop)      |  |  |
| 5.                                     | Bathymetry Software                    |  |  |
|  | Sub Total                              |  |  |
| <b>B.</b>                              | <b>Survey Boat and Accessories</b>     |  |  |
| 1.                                     | Survey Boat                            |  |  |
| 2.                                     | Boat Trailer                           |  |  |
| 3.                                     | Outboard Engine                        |  |  |
| 4.                                     | Voice Radio (set)                      |  |  |
|  | Sub Total                              |  |  |
| <b>C.</b>                              | <b>Auxilliary Equipment</b>            |  |  |
| 1.                                     | Battery Charger                        |  |  |
| 2.                                     | Generator                              |  |  |
| 3.                                     | UPS                                    |  |  |
| 4.                                     | PC                                     |  |  |
| 5.                                     | CD Recorder                            |  |  |
| 6.                                     | Plotter                                |  |  |
| 7.                                     | Printers                               |  |  |
|  | Sub Total                              |  |  |
|  | <b>TOTALS</b>                          |  |  |

- Note: 1. Specify according to the Instructions to Bidders and the related provisions in the Bid Data Sheet for all products quoted EXW or CIP named place of destination.
2. In case of discrepancy between unit price and total, the unit price shall prevail. Similarly, subtotals shall prevail over totals.

Signature of the Bidder \_\_\_\_\_

Consignee state: Kerala

Schedule 2.4. Inland Delivery Price Schedule

Site of delivery: \_\_\_\_\_

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No.   | Product Description                    | Unit price | Total price |
|--|--|------------|-------------|
|  |  | Rs.        | Rs.         |
| <b>Foreign Products (CIP) Named place of destination</b> |  |            |             |
| <b>A.</b>  | <b>Integrated Bathymetric System</b>   |            |             |
| 1.   | Hydrographic Echo Sounder              |            |             |
| 2.   | Sound Velocity Calibrator              |            |             |
| 3.   | Differential Global Positioning System |            |             |
| 4.   | Data Collection Computer (Laptop)      |            |             |
| 5.   | Bathymetry Software                    |            |             |
|  | Sub Total                              |            |             |
| <b>B.</b>  | <b>Survey Boat and Accessories</b>     |            |             |
| 1.   | Survey Boat                            |            |             |
| 2.   | Boat Trailer                           |            |             |
| 3.   | Outboard Engine                        |            |             |
| 4.   | Voice Radio (set)                      |            |             |
|  | Sub Total                              |            |             |
| <b>C.</b>  | <b>Auxilliary Equipment</b>            |            |             |
| 1.   | Battery Charger                        |            |             |
| 2.   | Generator                              |            |             |
| 3.   | UPS                                    |            |             |
| 4.   | PC                                     |            |             |
| 5.   | CD Recorder                            |            |             |
| 6.   | Plotter                                |            |             |
| 7.   | Printers                               |            |             |
|  | Sub Total                              |            |             |

| <b>Locally Supplied Products (EXW)</b> |  |               |  |
|--|--|---------------|--|
| <b>A.</b>                              | <b>Integrated Bathymetric System</b>   |               |  |
| 1.                                     | Hydrographic Echo Sounder              |               |  |
| 2.                                     | Sound Velocity Calibrator              |               |  |
| 3.                                     | Differential Global Positioning System |               |  |
| 4.                                     | Data Collection Computer (Laptop)      |               |  |
| 5.                                     | Bathymetry Software                    |               |  |
|  |  | Sub Total     |  |
| <b>B.</b>                              | <b>Survey Boat and Accessories</b>     |               |  |
| 1.                                     | Survey Boat                            |               |  |
| 2.                                     | Boat Trailer                           |               |  |
| 3.                                     | Outboard Engine                        |               |  |
| 4.                                     | Voice Radio (set)                      |               |  |
|  |  | Sub Total     |  |
| <b>C.</b>                              | <b>Auxilliary Equipment</b>            |               |  |
| 1.                                     | Battery Charger                        |               |  |
| 2.                                     | Generator                              |               |  |
| 3.                                     | UPS                                    |               |  |
| 4.                                     | PC                                     |               |  |
| 5.                                     | CD Recorder                            |               |  |
| 6.                                     | Plotter                                |               |  |
| 7.                                     | Printers                               |               |  |
|  |  | Sub Total     |  |
|  |  | <b>TOTALS</b> |  |

- Note: 1. Specify according to the Instructions to Bidders and the related provisions in the Bid Data Sheet for all products quoted EXW or CIP named place of destination.
2. In case of discrepancy between unit price and total, the unit price shall prevail. Similarly, subtotals shall prevail over totals.

Signature of the Bidder \_\_\_\_\_

Consignee state: Madhya Pradesh

Schedule 2.4. Inland Delivery Price Schedule

Site of delivery: \_\_\_\_\_

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Item No.   | Product Description                    | Unit price | Total price |
|--|--|------------|-------------|
|  |  | Rs.        | Rs.         |
| <b>Foreign Products (CIP) Named place of destination</b> |  |            |             |
| <b>A.</b>  | <b>Integrated Bathymetric System</b>   |            |             |
| 1.   | Hydrographic Echo Sounder              |            |             |
| 2.   | Sound Velocity Calibrator              |            |             |
| 3.   | Differential Global Positioning System |            |             |
| 4.   | Data Collection Computer (Laptop)      |            |             |
| 5.   | Bathymetry Software                    |            |             |
|  | Sub Total                              |            |             |
| <b>B.</b>  | <b>Survey Boat and Accessories</b>     |            |             |
| 1.   | Survey Boat                            |            |             |
| 2.   | Boat Trailer                           |            |             |
| 3.   | Outboard Engine                        |            |             |
| 4.   | Voice Radio (set)                      |            |             |
|  | Sub Total                              |            |             |
| <b>C.</b>  | <b>Auxilliary Equipment</b>            |            |             |
| 1.   | Battery Charger                        |            |             |
| 2.   | Generator                              |            |             |
| 3.   | UPS                                    |            |             |
| 4.   | PC                                     |            |             |
| 5.   | CD Recorder                            |            |             |
| 6.   | Plotter                                |            |             |
| 7.   | Printers                               |            |             |
|  | Sub Total                              |            |             |

| <b>Locally Supplied Products (EXW)</b> |  |  |  |
|--|--|--|--|
| <b>A.</b>                              | <b>Integrated Bathymetric System</b>   |  |  |
| 1.                                     | Hydrographic Echo Sounder              |  |  |
| 2.                                     | Sound Velocity Calibrator              |  |  |
| 3.                                     | Differential Global Positioning System |  |  |
| 4.                                     | Data Collection Computer (Laptop)      |  |  |
| 5.                                     | Bathymetry Software                    |  |  |
|  | Sub Total                              |  |  |
| <b>B.</b>                              | <b>Survey Boat and Accessories</b>     |  |  |
| 1.                                     | Survey Boat                            |  |  |
| 2.                                     | Boat Trailer                           |  |  |
| 3.                                     | Outboard Engine                        |  |  |
| 4.                                     | Voice Radio (set)                      |  |  |
|  | Sub Total                              |  |  |
| <b>C.</b>                              | <b>Auxilliary Equipment</b>            |  |  |
| 1.                                     | Battery Charger                        |  |  |
| 2.                                     | Generator                              |  |  |
| 3.                                     | UPS                                    |  |  |
| 4.                                     | PC                                     |  |  |
| 5.                                     | CD Recorder                            |  |  |
| 6.                                     | Plotter                                |  |  |
| 7.                                     | Printers                               |  |  |
|  | Sub Total                              |  |  |
|  | <b>TOTALS</b>                          |  |  |

- Note: 1. Specify according to the Instructions to Bidders and the related provisions in the Bid Data Sheet for all products quoted EXW or CIP named place of destination.
2. In case of discrepancy between unit price and total, the unit price shall prevail. Similarly, subtotals shall prevail over totals.

Signature of the Bidder \_\_\_\_\_



### 3.0 Recurrent Costs Form

Consignee state: Gujarat

#### Prices during the maintenance period of three (3) years

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Base Cost<br>(i.e., during Warranty) | Maximum compounded costs per annum after expiration of the warranty period |                              |                              |                          |
|--------------------------------------|--|------------------------------|------------------------------|--------------------------|
|                                      | Year 1<br>[Rx <sub>1</sub> ]   | Year 2<br>[Rx <sub>2</sub> ] | Year 3<br>[Rx <sub>3</sub> ] | Total Recurrent<br>Costs |
|                                      |  |                              |                              |                          |
|                                      |  |                              |                              |                          |
| <b>TOTAL</b>                         |  |                              |                              |                          |

- Note: 1. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet. A separate copy of the form should be used for each different foreign currency quoted, and Products and Services should be listed separately and subtotaled.
2. The annual costs [Rx<sub>n</sub>] should indicate the total costs for the year. The Bidder shall quote the number of years of recurrent costs as specified in the Bid Data Sheet, which will be combined with the Bid Price using a Net Present value calculation for evaluation purposes. The extent to which these costs are to be part of the Contract is defined in SCC.

Signature of the Bidder \_\_\_\_\_

### 3.0 Recurrent Costs Form

Consignee state: Orissa

#### Prices during the maintenance period of three (3) years

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Base Cost<br>(i.e., during Warranty) | Maximum compounded costs per annum after expiration of the warranty period |                              |                              |                          |
|--------------------------------------|--|------------------------------|------------------------------|--------------------------|
|                                      | Year 1<br>[Rx <sub>1</sub> ]   | Year 2<br>[Rx <sub>2</sub> ] | Year 3<br>[Rx <sub>3</sub> ] | Total Recurrent<br>Costs |
|                                      |  |                              |                              |                          |
|                                      |  |                              |                              |                          |
| <b>TOTAL</b>                         |  |                              |                              |                          |

- Note: 1. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet. A separate copy of the form should be used for each different foreign currency quoted, and Products and Services should be listed separately and subtotaled.
2. The annual costs [Rx<sub>n</sub>] should indicate the total costs for the year. The Bidder shall quote the number of years of recurrent costs as specified in the Bid Data Sheet, which will be combined with the Bid Price using a Net Present value calculation for evaluation purposes. The extent to which these costs are to be part of the Contract is defined in SCC.

Signature of the Bidder \_\_\_\_\_

### 3.0 Recurrent Costs Form

Consignee state: Maharashtra

#### Prices during the maintenance period of three (3) years

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Base Cost<br>(i.e., during Warranty) | Maximum compounded costs per annum after expiration of the warranty period |                              |                              |                          |
|--------------------------------------|--|------------------------------|------------------------------|--------------------------|
|                                      | Year 1<br>[Rx <sub>1</sub> ]   | Year 2<br>[Rx <sub>2</sub> ] | Year 3<br>[Rx <sub>3</sub> ] | Total Recurrent<br>Costs |
|                                      |  |                              |                              |                          |
|                                      |  |                              |                              |                          |
| <b>TOTAL</b>                         |  |                              |                              |                          |

- Note: 1. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet. A separate copy of the form should be used for each different foreign currency quoted, and Products and Services should be listed separately and subtotaled.
2. The annual costs [Rx<sub>n</sub>] should indicate the total costs for the year. The Bidder shall quote the number of years of recurrent costs as specified in the Bid Data Sheet, which will be combined with the Bid Price using a Net Present value calculation for evaluation purposes. The extent to which these costs are to be part of the Contract is defined in SCC.

Signature of the Bidder \_\_\_\_\_

### 3.0 Recurrent Costs Form

Consignee: CWPRS (Pune)

#### Prices during the maintenance period of three (3) years

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Base Cost<br>(i.e., during Warranty) | Maximum compounded costs per annum after expiration of the warranty period |                              |                              |                          |
|--------------------------------------|--|------------------------------|------------------------------|--------------------------|
|                                      | Year 1<br>[Rx <sub>1</sub> ]   | Year 2<br>[Rx <sub>2</sub> ] | Year 3<br>[Rx <sub>3</sub> ] | Total Recurrent<br>Costs |
|                                      |  |                              |                              |                          |
|                                      |  |                              |                              |                          |
| <b>TOTAL</b>                         |  |                              |                              |                          |

- Note: 1. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet. A separate copy of the form should be used for each different foreign currency quoted, and Products and Services should be listed separately and subtotaled.
2. The annual costs [Rx<sub>n</sub>] should indicate the total costs for the year. The Bidder shall quote the number of years of recurrent costs as specified in the Bid Data Sheet, which will be combined with the Bid Price using a Net Present value calculation for evaluation purposes. The extent to which these costs are to be part of the Contract is defined in SCC.

Signature of the Bidder \_\_\_\_\_

### 3.0 Recurrent Costs Form

Consignee state: Andhra Pradesh

#### Prices during the maintenance period of three (3) years

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Base Cost<br>(i.e., during Warranty) | Maximum compounded costs per annum after expiration of the warranty period |                              |                              |                          |
|--------------------------------------|--|------------------------------|------------------------------|--------------------------|
|                                      | Year 1<br>[Rx <sub>1</sub> ]   | Year 2<br>[Rx <sub>2</sub> ] | Year 3<br>[Rx <sub>3</sub> ] | Total Recurrent<br>Costs |
|                                      |  |                              |                              |                          |
|                                      |  |                              |                              |                          |
| <b>TOTAL</b>                         |  |                              |                              |                          |

- Note: 1. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet. A separate copy of the form should be used for each different foreign currency quoted, and Products and Services should be listed separately and subtotaled.
2. The annual costs [Rx<sub>n</sub>] should indicate the total costs for the year. The Bidder shall quote the number of years of recurrent costs as specified in the Bid Data Sheet, which will be combined with the Bid Price using a Net Present value calculation for evaluation purposes. The extent to which these costs are to be part of the Contract is defined in SCC.

Signature of the Bidder \_\_\_\_\_

### 3.0 Recurrent Costs Form

Consignee state: Tamil Nadu

#### Prices during the maintenance period of three (3) years

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Base Cost<br>(i.e., during Warranty) | Maximum compounded costs per annum after expiration of the warranty period |                              |                              |                          |
|--------------------------------------|--|------------------------------|------------------------------|--------------------------|
|                                      | Year 1<br>[Rx <sub>1</sub> ]   | Year 2<br>[Rx <sub>2</sub> ] | Year 3<br>[Rx <sub>3</sub> ] | Total Recurrent<br>Costs |
|                                      |  |                              |                              |                          |
|                                      |  |                              |                              |                          |
| <b>TOTAL</b>                         |  |                              |                              |                          |

- Note: 1. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet. A separate copy of the form should be used for each different foreign currency quoted, and Products and Services should be listed separately and subtotaled.
2. The annual costs [Rx<sub>n</sub>] should indicate the total costs for the year. The Bidder shall quote the number of years of recurrent costs as specified in the Bid Data Sheet, which will be combined with the Bid Price using a Net Present value calculation for evaluation purposes. The extent to which these costs are to be part of the Contract is defined in SCC.

Signature of the Bidder \_\_\_\_\_

### 3.0 Recurrent Costs Form

Consignee state: Karnataka

#### Prices during the maintenance period of three (3) years

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Base Cost<br>(i.e., during Warranty) | Maximum compounded costs per annum after expiration of the warranty period |                              |                              |                          |
|--------------------------------------|--|------------------------------|------------------------------|--------------------------|
|                                      | Year 1<br>[Rx <sub>1</sub> ]   | Year 2<br>[Rx <sub>2</sub> ] | Year 3<br>[Rx <sub>3</sub> ] | Total Recurrent<br>Costs |
|                                      |  |                              |                              |                          |
|                                      |  |                              |                              |                          |
| <b>TOTAL</b>                         |  |                              |                              |                          |

- Note: 1. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet. A separate copy of the form should be used for each different foreign currency quoted, and Products and Services should be listed separately and subtotaled.
2. The annual costs [Rx<sub>n</sub>] should indicate the total costs for the year. The Bidder shall quote the number of years of recurrent costs as specified in the Bid Data Sheet, which will be combined with the Bid Price using a Net Present value calculation for evaluation purposes. The extent to which these costs are to be part of the Contract is defined in SCC.

Signature of the Bidder \_\_\_\_\_

### 3.0 Recurrent Costs Form

Consignee state: Kerala

#### Prices during the maintenance period of three (3) years

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Base Cost<br>(i.e., during Warranty) | Maximum compounded costs per annum after expiration of the warranty period |                              |                              |                          |
|--------------------------------------|--|------------------------------|------------------------------|--------------------------|
|                                      | Year 1<br>[Rx <sub>1</sub> ]   | Year 2<br>[Rx <sub>2</sub> ] | Year 3<br>[Rx <sub>3</sub> ] | Total Recurrent<br>Costs |
|                                      |  |                              |                              |                          |
|                                      |  |                              |                              |                          |
| <b>TOTAL</b>                         |  |                              |                              |                          |

- Note: 1. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet. A separate copy of the form should be used for each different foreign currency quoted, and Products and Services should be listed separately and subtotaled.
2. The annual costs [Rx<sub>n</sub>] should indicate the total costs for the year. The Bidder shall quote the number of years of recurrent costs as specified in the Bid Data Sheet, which will be combined with the Bid Price using a Net Present value calculation for evaluation purposes. The extent to which these costs are to be part of the Contract is defined in SCC.

Signature of the Bidder \_\_\_\_\_



### 3.0 Recurrent Costs Form

Consignee state: Madhya Pradesh

#### Prices during the maintenance period of three (3) years

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

| Base Cost<br>(i.e., during Warranty) | Maximum compounded costs per annum after expiration of the warranty period |                              |                              |                          |
|--------------------------------------|--|------------------------------|------------------------------|--------------------------|
|                                      | Year 1<br>[Rx <sub>1</sub> ]   | Year 2<br>[Rx <sub>2</sub> ] | Year 3<br>[Rx <sub>3</sub> ] | Total Recurrent<br>Costs |
|                                      |  |                              |                              |                          |
|                                      |  |                              |                              |                          |
| <b>TOTAL</b>                         |  |                              |                              |                          |

- Note: 1. Specify currency, quoted in accordance with Instructions to Bidders and related provisions in the Bid Data Sheet. A separate copy of the form should be used for each different foreign currency quoted, and Products and Services should be listed separately and subtotaled.
2. The annual costs [Rx<sub>n</sub>] should indicate the total costs for the year. The Bidder shall quote the number of years of recurrent costs as specified in the Bid Data Sheet, which will be combined with the Bid Price using a Net Present value calculation for evaluation purposes. The extent to which these costs are to be part of the Contract is defined in SCC.

Signature of the Bidder \_\_\_\_\_

## Bid Price Summary Form

**Consignee state: Gujarat**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

|  | Foreign Currency # 1 |          | Foreign Currency # 2 |          | Foreign Currency # 3 |          | Local Currency |
|--|----------------------|----------|----------------------|----------|----------------------|----------|----------------|
|  | Amount               | Currency | Amount               | Currency | Amount               | Currency | Amount         |
| Schedule – I   |                      |          |                      |          |                      |          |                |
| Schedule – II  |                      |          |                      |          |                      |          |                |
| Schedule - III   |                      |          |                      |          |                      |          |                |
| <b>TOTAL BID PRICE:</b><br>(to Grand Summary of Bid Price) |                      |          |                      |          |                      |          |                |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Signature of the Bidder \_\_\_\_\_

## Bid Price Summary Form

**Consignee state: Orissa**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

|  | Foreign Currency # 1 |          | Foreign Currency # 2 |          | Foreign Currency # 3 |          | Local Currency |
|--|----------------------|----------|----------------------|----------|----------------------|----------|----------------|
|  | Amount               | Currency | Amount               | Currency | Amount               | Currency | Amount         |
| Schedule – I   |                      |          |                      |          |                      |          |                |
| Schedule – II  |                      |          |                      |          |                      |          |                |
| Schedule - III   |                      |          |                      |          |                      |          |                |
| <b>TOTAL BID PRICE:</b><br>(to Grand Summary of Bid Price) |                      |          |                      |          |                      |          |                |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Signature of the Bidder \_\_\_\_\_

## Bid Price Summary Form

**Consignee state: Maharashtra**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

|  | Foreign Currency # 1 |          | Foreign Currency # 2 |          | Foreign Currency # 3 |          | Local Currency |
|--|----------------------|----------|----------------------|----------|----------------------|----------|----------------|
|  | Amount               | Currency | Amount               | Currency | Amount               | Currency | Amount         |
| Schedule – I   |                      |          |                      |          |                      |          |                |
| Schedule – II  |                      |          |                      |          |                      |          |                |
| Schedule - III   |                      |          |                      |          |                      |          |                |
| <b>TOTAL BID PRICE:</b><br>(to Grand Summary of Bid Price) |                      |          |                      |          |                      |          |                |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Signature of the Bidder \_\_\_\_\_

## Bid Price Summary Form

**Consignee: (GoI)**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

|  | Foreign Currency # 1 |          | Foreign Currency # 2 |          | Foreign Currency # 3 |          | Local Currency |
|--|----------------------|----------|----------------------|----------|----------------------|----------|----------------|
|  | Amount               | Currency | Amount               | Currency | Amount               | Currency | Amount         |
| Schedule – I   |                      |          |                      |          |                      |          |                |
| Schedule – II  |                      |          |                      |          |                      |          |                |
| Schedule - III   |                      |          |                      |          |                      |          |                |
| <b>TOTAL BID PRICE:</b><br>(to Grand Summary of Bid Price) |                      |          |                      |          |                      |          |                |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Signature of the Bidder \_\_\_\_\_

## Bid Price Summary Form

**Consignee state: Andhra Pradesh**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

|  | Foreign Currency # 1 |          | Foreign Currency # 2 |          | Foreign Currency # 3 |          | Local Currency |
|--|----------------------|----------|----------------------|----------|----------------------|----------|----------------|
|  | Amount               | Currency | Amount               | Currency | Amount               | Currency | Amount         |
| Schedule – I   |                      |          |                      |          |                      |          |                |
| Schedule – II  |                      |          |                      |          |                      |          |                |
| Schedule - III   |                      |          |                      |          |                      |          |                |
| <b>TOTAL BID PRICE:</b><br>(to Grand Summary of Bid Price) |                      |          |                      |          |                      |          |                |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Signature of the Bidder \_\_\_\_\_

## Bid Price Summary Form

**Consignee state: Tamil Nadu**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

|  | Foreign Currency # 1 |          | Foreign Currency # 2 |          | Foreign Currency # 3 |          | Local Currency |
|--|----------------------|----------|----------------------|----------|----------------------|----------|----------------|
|  | Amount               | Currency | Amount               | Currency | Amount               | Currency | Amount         |
| Schedule – I   |                      |          |                      |          |                      |          |                |
| Schedule – II  |                      |          |                      |          |                      |          |                |
| Schedule - III   |                      |          |                      |          |                      |          |                |
| <b>TOTAL BID PRICE:</b><br>(to Grand Summary of Bid Price) |                      |          |                      |          |                      |          |                |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Signature of the Bidder \_\_\_\_\_

## Bid Price Summary Form

**Consignee state: Karnataka**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

|  | Foreign Currency # 1 |          | Foreign Currency # 2 |          | Foreign Currency # 3 |          | Local Currency |
|--|----------------------|----------|----------------------|----------|----------------------|----------|----------------|
|  | Amount               | Currency | Amount               | Currency | Amount               | Currency | Amount         |
| Schedule – I   |                      |          |                      |          |                      |          |                |
| Schedule – II  |                      |          |                      |          |                      |          |                |
| Schedule - III   |                      |          |                      |          |                      |          |                |
| <b>TOTAL BID PRICE:</b><br>(to Grand Summary of Bid Price) |                      |          |                      |          |                      |          |                |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Signature of the Bidder \_\_\_\_\_



## Bid Price Summary Form

**Consignee state: Kerala**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

|  | Foreign Currency # 1 |          | Foreign Currency # 2 |          | Foreign Currency # 3 |          | Local Currency |
|--|----------------------|----------|----------------------|----------|----------------------|----------|----------------|
|  | Amount               | Currency | Amount               | Currency | Amount               | Currency | Amount         |
| Schedule – I   |                      |          |                      |          |                      |          |                |
| Schedule – II  |                      |          |                      |          |                      |          |                |
| Schedule - III   |                      |          |                      |          |                      |          |                |
| <b>TOTAL BID PRICE:</b><br>(to Grand Summary of Bid Price) |                      |          |                      |          |                      |          |                |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Signature of the Bidder \_\_\_\_\_

## Bid Price Summary Form

**Consignee state: Madhya Pradesh**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

|  | Foreign Currency # 1 |          | Foreign Currency # 2 |          | Foreign Currency # 3 |          | Local Currency |
|--|----------------------|----------|----------------------|----------|----------------------|----------|----------------|
|  | Amount               | Currency | Amount               | Currency | Amount               | Currency | Amount         |
| Schedule – I   |                      |          |                      |          |                      |          |                |
| Schedule – II  |                      |          |                      |          |                      |          |                |
| Schedule - III   |                      |          |                      |          |                      |          |                |
| <b>TOTAL BID PRICE:</b><br>(to Grand Summary of Bid Price) |                      |          |                      |          |                      |          |                |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Signature of the Bidder \_\_\_\_\_

## 5. Bid Security Form

Whereas *[name of the Bidder]* (herein after called “the Bidder”) has submitted its bid dated *[date of submission of bid]* for the supply of *[name and/or description of the systems]* (hereinafter called “the Bid”).

KNOW ALL PEOPLE by these presents that we *[name of bank]* of *[name of country]*, having our registered office at *[address of bank]* (hereinafter called “the Bank”), are bound unto *[name of Purchaser]* (hereinafter called “the Purchaser”) in the sum of for which payment well and truly to be made to the said Purchaser, the Bank binds itself, its successors, and assigns by these presents.

Sealed with the Common Seal of the said Bank this \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_\_.

THE CONDITIONS of this obligation are:

- 1 If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Form; or
- 2 If the Bidder, having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity:
  - (a) fails or refuses to execute the Contract Form, if required; or
  - (b) fails or refuses to furnish the performance security, in accordance with the Instruction to Bidders;

We undertake to pay to the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser will note that the amount claimed by it is due to it, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force up to and including forty five (45) days after the period of bid validity, and any demand in respect thereof should reach the Bank not later than the above date.

---

*[duly authorized signature of the Bank]*

## 6. Form of Contract Agreement

THIS AGREEMENT made the \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_ between *[name of Purchaser]* of *[country of Purchaser]* (hereinafter called “the Purchaser”) of the one part and *[name of Supplier]* of *[city and country of Supplier]* (hereinafter called “the Supplier”) of the other part:

WHEREAS the Purchaser invited bids for certain products and ancillary services, viz., *[brief description of the Integrated Bathymetric Systems]* and has accepted a bid by the Supplier for the supply of those products and services in the sum of *[contract price in words and figures]* (hereinafter called “the Contract Price”).

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.
2. The following documents shall be deemed to form and be read and constructed as part of this Agreement, viz.:
  - (a) the Schedule of requirements;
  - (b) the Technical Specifications;
  - (c) the Special Conditions of Contract;
  - (d) the General Conditions of Contract;
  - (e) the Purchaser’s Notification of Award of Contract; and
  - (f) the Supplier’s Bid.
3. 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 products and services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the products 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 their respective laws the day and the year first above written.

Signed, sealed, and delivered by the \_\_\_\_\_

said *[name of representative]* (for the Purchaser) \_\_\_\_\_

in the presence of *[name of witness]* \_\_\_\_\_

Signed, sealed, and delivered by the \_\_\_\_\_

said *[name of representative]* (for the Supplier) \_\_\_\_\_

in the presence of *[name of witness]* \_\_\_\_\_

*Note: This would be executed by each consignee*

## 7. Performance Security Form

To: *[name of Purchaser]*

WHEREAS *[name of Supplier]* (hereinafter called "the Supplier") has undertaken, in pursuance of Contract No. *[Reference number of the Contract]* dated \_\_\_\_\_ 19\_\_\_\_ to supply *[description on Integrated Bathymetric Systems]* (hereinafter called "the Contract").

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier shall furnish you with a bank guarantee by a reputable bank for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Supplier a guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of *[amount of the guarantee in words and figures]*, and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract and without cavil or argument, any sum or sums within the limits of *[amount of guarantee]* as aforesaid, without your needing to prove or show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_\_.

---

Signature and seal of the Guarantors

---

*[address]*

---

*[date]*

## 8. Service Support Details

(Clause 12 of ITB)

| NEAREST SERVICE CENTRE |             |           |         |   |                     |                         |   |   |
|------------------------|-------------|-----------|---------|---|---------------------|-------------------------|---|---|
| Pack No.               | Destination | Location  |         | Status of Office Working days and Hours | Number of Engineers | Number of Service Staff | Value of minimum staff available at all times | List of models and type of equipment serviced in last two years |
|                        |             | Phone No. | Fax No. |   |                     |                         |   |   |
|                        |             |           |         |   |                     |                         |   |   |

Signature and Seal of the  
Manufacturer/Bidder

## 9. Producer's Authorization Form

*[see clause 12 of the Instruction to Bidders]*

To: *[name of Purchaser]*

WHEREAS *[name of the Producer]* who are established and reputable producers of *[name and/or description of the products]* having production facilities at *[address of factory]*

do hereby authorize *[name and address of Agent]* to submit a bid, and subsequently negotiate and sign the Contract with you against IFB No. *[Reference of the Invitation to Bid]* for the above products produced by us.

We hereby extend our full guarantee and warranty as per Clause 34 of the General Conditions of Contract for the products offered for supply by the above firm against this Invitation for Bids and duly authorize said firm to act on our behalf in fulfilling all installation, technical support and maintenance obligations required by the Contract.

---

*[Signature for and on behalf of Producer]*

Note : This letter of authority must be on the letterhead of the Producer, must be signed by a person competent and having the power of attorney to bind the Producer, and must be included by the Bidder in its Bid.



## 10. Form of Declaration regarding Deemed Export Benefits

(Name of the Project)

(Bidder's Name and Address):

To: \_\_\_\_\_  
(Name of the Purchaser)

Dear Sir,

1. We confirm that we are solely responsible for obtaining deemed export benefits which we have considered in our bid and in case of failure to receive such benefits, Purchaser will not compensate us.
2. We are furnishing below the information required by the Purchaser for issue of Project Authority/Payment certificate in terms of Export and Import Policy of the Government of India:
  - (A) (i) Value of import content of supply to be made by the Bidder: Rs. \_\_\_\_\_  
(exchange rate one US\$ = Rs. \_\_\_\_)
  - (B) (i) Name of the sub-contractor, if any, and whose name is to be included in the main Contract: \_\_\_\_\_  
\_\_\_\_\_
  - (ii) Description, quantity and value of the goods to be supplied by the above sub-contractor: Description \_\_\_\_\_  
Quantity \_\_\_\_\_  
Value (Rs.) \_\_\_\_\_
  - (iii) Value of import content of supply to be made by the sub-contractor: Rs. \_\_\_\_\_  
(exchange rate one US\$ = Rs. \_\_\_\_\_)

*(The requirements listed above may be modified, if necessary, in terms of the Export and Import Policy in force).*

Date: \_\_\_\_\_ (Signature) \_\_\_\_\_

Place: \_\_\_\_\_ (Printed Name) \_\_\_\_\_

(Designation) \_\_\_\_\_

(Common Seal) \_\_\_\_\_

## 11. Proforma for Performance Statement

(for a period of last three years)

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

Name of the Firm \_\_\_\_\_

| Order Placed By (full address of Purchaser) | Order No. and Date | Description and Quantity of ordered equipment and/or application software packages | Value of order | Date of completion of delivery |             | Remarks indicating reasons for late delivery, if any | Has the Project been satisfactorily functioning? (attach a certificate from the Purchaser/Consignee) |
|---|--------------------|--|----------------|--------------------------------|-------------|--|--|
|   |                    |  |                | As per Contract                | Actual Date |  |  |
| (1)   | (2)                | (3)  | (4)            | (5)                            | (6)         | (7)  | (8)  |
|   |                    |  |                |                                |             |  |  |
|   |                    |  |                |                                |             |  |  |
|   |                    |  |                |                                |             |  |  |
|   |                    |  |                |                                |             |  |  |
|   |                    |  |                |                                |             |  |  |

Signature and seal of the Bidder \_\_\_\_\_

## 12. Proforma of Certificate for Issue by the Purchaser after Successful Commissioning of System

No.: \_\_\_\_\_

Date: \_\_\_\_\_

M/s.

**Sub: Certificate of commissioning System**

1. This is to certify that the System as detailed below has/have been received in good condition alongwith all the standard and special accessories (subject to remarks in Para No. 2) and a set of spares in accordance with the Contract/Specifications. The same has been installed and commissioned.

a) Contract No. \_\_\_\_\_ dated \_\_\_\_\_

b) Description of the equipment \_\_\_\_\_

c) Plant Nos. \_\_\_\_\_

d) Quantity \_\_\_\_\_

e) Bill of Lading \_\_\_\_\_ dated \_\_\_\_\_  
(for import contract)

f) Name of the vessel/transporter \_\_\_\_\_

g) R/R No. \_\_\_\_\_ dated \_\_\_\_\_

h) Name of the Consignee \_\_\_\_\_

i) Date of commissioning and proving test \_\_\_\_\_

2. Details of accessories/spares not yet supplied and recoveries to be made on that account:

| S. No. | Description | Amount to be recovered |
|--------|-------------|------------------------|
|        |             |                        |
|        |             |                        |

3. The proving test has been done to our entire satisfaction and operators have been trained to operate the plant.

4. The supplier has fulfilled his contractual obligations satisfactorily \*

Or

The supplier has failed to fulfil his contractual obligations with regard to the following:

- (a)
  - (b)
  - (c)
  - (d)
5. The amount of recovery on account of non-supply of accessories and spares is given in Para No. 2
6. The amount of recovery on account of failure of the supplier to meet his contractual obligations is as indicated in endorsement of the letter.

Signature \_\_\_\_\_

Name \_\_\_\_\_

Designation with stamp \_\_\_\_\_

- 
- Explanatory notes for filling up the certificates:
    - (a) He has adhered to the time schedule specified in the contract in despatching the documents/drawings pursuant to Technical Specifications.
    - (b) He has supervised the commissioning of the equipment in time i.e. within the period specified in the contract from the date of intimation by the Purchaser in respect of the installation of the plant.
    - (c) Training of personnel has been done by the supplier as specified in the contract.
    - (d) In the event of documents/drawings having not been supplied or installation and commissioning of the equipment have been delayed on account of the supplier, the extent of delay should always be mentioned.



**Grand Summary of Bid Price for all Consignees**

| <b>No.</b>  | <b>Name of Consignee</b>       | <b>No. of Bathymetry Sets</b> | <b>Total Price</b> |                   |                 |
|-------------|--------------------------------|-------------------------------|--------------------|-------------------|-----------------|
|             |                                |                               | <b>Currency</b>    | <b>In Figures</b> | <b>In Words</b> |
| <b>I</b>    | <b>Govt. of India</b>          | <b>1 (one)</b>                |                    |                   |                 |
| <b>II</b>   | <b>Govt. of Gujarat</b>        | <b>2 (two)</b>                |                    |                   |                 |
| <b>III</b>  | <b>Govt. of Orissa</b>         | <b>1 (one)</b>                |                    |                   |                 |
| <b>IV</b>   | <b>Govt. of Madhya Pradesh</b> | <b>1 (one)</b>                |                    |                   |                 |
| <b>V</b>    | <b>Govt. of Maharashtra</b>    | <b>1 (one)</b>                |                    |                   |                 |
| <b>VI</b>   | <b>Govt. of Andhra Pradesh</b> | <b>2 (two)</b>                |                    |                   |                 |
| <b>VII</b>  | <b>Govt. of Tamil Nadu</b>     | <b>1 (one)</b>                |                    |                   |                 |
| <b>VIII</b> | <b>Govt. of Karnataka</b>      | <b>1 (one)</b>                |                    |                   |                 |
| <b>IX</b>   | <b>Govt. of Kerala</b>         | <b>1 (one)</b>                |                    |                   |                 |
|             |                                |                               | <b>Total</b>       |                   |                 |

**Signature of Bidder**

## **Section VII**

# **Technical Specifications**

# INTEGRATED BATHYMETRIC SYSTEM

## Purpose

The integrated bathymetric system will be used to collect data on depth and bottom topology of reservoirs and rivers. Primary application is reservoir sedimentation surveying; products will be reservoir capacity figures as a function of depth, depth contours and bottom topology change over time.

The integrated bathymetric system shall comprise the following components:

1. echosounder
  2. sound velocity calibrator
  3. differential global positioning system
  4. data collection computer
  5. bathymetric surveying software for data acquisition, storage and processing and including a helmsman display
  6. programme for training of personnel.
- The system shall be installed on a survey boat; the boat is part of the delivery.
  - The proper functioning of the bathymetric system shall be demonstrated prior to final acceptance by the consignee.

The survey boat shall be fitted for bathymetric surveying in reservoirs. The boat shall be equipped with two outboard engines and a voice radio system. Overland, the boat shall be transported on a boat trailer.

7. survey boat
8. boat trailer
9. outboard engines
10. voice radio

To support the bathymetric system and for data processing and presentation purposes, the following auxiliary equipment shall be part of the delivery.

11. battery charger
12. portable generator
13. UPS
14. office computer
15. CD-recorder
16. plotter
17. printer

## Conditions and Requirements

### Bathymetric equipment and software

- Primary requirement is that echosounder, DGPS, data acquisition computer, software and helmsman display match with each other and are supplied/implemented as an integrated system. Therefore, the bathymetry software shall have device drivers to facilitate interfacing of a wide range of echosounders and DGPS to the data acquisition computer.
- Data exchange between data acquisition computer (a Laptop PC), echosounder and DGPS shall be efficient and error free.
- The system shall be fully Y2K compliant.
- The system shall be portable.



- The system shall be rugged and easy to install.
- The system shall be easy to operate.
- Power supply is from car-batteries or similar devices. A mains powered battery charger shall be part of the supplied system.
- While sailing pre-defined lines, the survey PC shall acquire data from the positioning system and the echosounder. All data relevant for production of charts and depth data shall be stored on the data acquisition computer, that is the survey PC.
- The helmsman shall receive steering data via a separate helmsman display, showing a left-right indicator and depth data and other data to enhance the navigation accuracy and efficiency.
- The data collection software shall be adequate for the application.
- The data collection software in relation to the survey PC shall feature ample performance for effective operation at relatively high sailing velocity maintaining the specified spatial and temporal resolution with out loss of accuracy.
- The supplier shall provide comprehensive training at the designated site for each consignee.
- As all instruments are portable, they shall be mounted in a portable transport box (e.g. an instrument flight case) with a front and rear lid. The front lid shall give access to the instruments, and the rear lid shall give access to connections for data-exchange, power and antenna.
- All cables and connectors shall be sturdy and compliant with IP65.
- All connectors/cable-ends shall bear clear identification labelling.
- All system components shall utilise SI units.

### **The survey boat**

- The survey boat shall be prepared for bathymetric surveying.
- The boat shall be fitted with three small antenna stands for: the GPS antenna, the data communication antenna and the voice radio antenna.
- The boat shall have ample space to install all equipment as required and specified for the surveying system.
- The support(s) cum racks for the equipment shall be very stable and sturdy.
- There shall be provisions to securely fix the equipment to the support.
- The boat shall have a worktable for the surveyor.
- The worktable shall have ample space for the survey PC, the mouse and writing space for the surveyor.
- The work table shall be in such a position relative to windows and other openings that the survey computer display can be easily read without eye strain for the surveyor due to ambient light, back lightning etc. .
- All electrical equipment shall receive power from one or more (in parallel) car batteries, the supply voltage is 12 VDC nominal.
- The batteries shall be kept in a protection box, which is kept in the boat.
- The protection box shall keep the batteries dry under all weather and sailing conditions.
- The protection box shall be constructed of non-corrosive and acid proof materials.
- The connections to the batteries shall be acid and corrosion proof.
- The boat shall have cable guides for fastening and protection of all cables, e.g. for power, data exchange between instruments, PC and echosounder transducers .
- At the equipment end, the cables shall be fitted with sturdy and corrosion proof connectors.
- The cable ends shall have sufficient freedom to allow easy connection and disconnection.
- The helmsman display shall be installed at a convenient place near the helmsman.

**Note :** Installation drawing showing the set up of various instruments in the boat shall be supplied by the bidder.

## **Auxiliary equipment**

- The battery chargers shall adequately and quickly charge the type of car batteries that is used on board the survey boat and at the GPS reference station.
- The battery chargers may be used on shore and/or on board the survey boat.
- The portable generator will be used to supply the battery charger and/or the UPS.
- The portable generator shall have sufficient capacity for these applications.
- The UPS will be used in an office environment to reliably deliver power to the data processing PC and the printers and plotter.
- The UPS will be used from the generator and from mains supply.
- The UPS shall be of such a design that it can withstand the power/voltage fluctuations associated with mains power supply derived from a portable generator.
- Office PCs shall be used for data processing and presentation purposes.
- The office PCs shall be optimised for the data processing and presentation application.
- The CD-recorder shall reliably record all kinds of data.
- The physical and chemical composition of the CD's shall be stable enough to allow reliable data recovery after 20 years of storage under the local climatological conditions.
- The CD-recorders and media shall be compatible with the standard CD readers of the laptop and office PC's.
- A plotter/printer shall be used for presentation of collected data and processing results.
- The plotter/printer shall be of a colour inkjet type and support the bathymetric data processing and presentation software.
- It shall be possible to use the plotter/printer on board the survey boat, with power supply from the car battery(ies), without the UPS.
- A printer shall be used for reporting and data presentation.
- The printer shall support all graphical output, in black/white, as can be generated by the bathymetric software.

# HYDROGRAPHIC ECHO-SOUNDER

## Purpose

The hydrographic echosounder shall measure depth in reservoirs and rivers and output the readings to a data collection system.

## Conditions and Requirements

- The hydrographic echosounder shall be of such a design that it operates reliably and accurately under the prevailing environmental and operational conditions.
- The echosounder shall be easy to operate and maintain.
- The echosounder shall be supplied with the accessories as needed for effective deployment.
- All materials on the echosounder exterior shall be non-corrosive.
- All cables and connectors shall be sturdy and compliant with IP65.
- The echosounder shall be of a rugged design that can cope with the prevailing shock and vibration as experienced in mobile operations and during transport.
- The echosounder shall have an expected technical lifetime of not less than 10 years.
- Operating and maintenance manuals related to the type and model of the echosounder shall be part of the delivery.
- Power will be supplied by a standard car battery
- Power consumption shall be moderate.
- An integrated digitiser shall convert the depth readings into numerical data.
- Actual depth readings shall be digitally presented on a LCD display, and recorded by an integrated paper chart recorder or visualised on a graphic LCD display in similar fashion as a chart recording.
- The depth readings shall be transmitted by serial communication to the controlling PC.
- Within the specified supply voltage range, the displayed value shall not depend on supply voltage.
- The echosounder shall have adjustment facilities for at least draft, speed of sound, sensitivity, recording range, time dependent gain control and grey scale, control of recorder mode and paper speed.
- The indicated range shall be distance to the bottom, in meters. Hence, the echosounder should suppress multiple echoes and echoes from the water surface (backward sensitivity).
- The depth display shall be easily readable by day, exposed to direct sunlight, and at night.
- The echosounder shall have illumination on the paper chart recorder and on the digital display.
- The echosounder shall have a good performance in sediment-laden waters.
- Operation with transducers in air shall not result in damage or non-compliance with any specification when submersed again.

## Specifications

**two acoustic transducers viz.**

**acoustic transducer 1**

**acoustic frequency**                    200 kHz  $\pm$  15

**transducer beam width**                 $\leq$ 10 degrees

|                                  |  |
|----------------------------------|--|
| <b>acoustic transducer 2</b>     |  |
| <b>acoustic frequency</b>        | one frequency in the range between 15 to 45 kHz  |
| <b>transducer beam width</b>     | ≤30 degrees  |
| <b>transducers 1 and 2</b>       |  |
| <b>depth ranges</b>              | selectable up to 250 m (0 to 10, 25, 50, 100, 250 m) or equivalent                         |
| <b>minimum depth</b>             | ≤ 1m below transducer  |
| <b>output power</b>              | ≥ 250 W  |
| <b>transducer cable length</b>   | 8 m  |
| <b>alarm</b>                     | adjustable low depth indication  |
| <b>speed of sound adjustment</b> | 1400 to 1550 m/s in steps of ≤1 m/s  |
| <b>measuring rate</b>            | ≥5 readings/second   |
| <b>digitiser accuracy</b>        | 0.25% of indicated depth   |
| <b>digitiser resolution</b>      | 0.01 m or better   |
| <b>gating</b>                    | bottom tracking, and adjustable gate width   |
| <b>display</b>                   | LCD with good daylight readability   |
| <b>interface</b>                 | USB or one of RS232, RS422, RS485 for output of depth information and input of annotation. |
| <b>data format</b>               | NMEA-0183  |
| <b>update interval</b>           | ≤ 1 second   |
| <b>recording method</b>          | electrical (classic), thermal or jet paper or LCD display with printer support             |
| <b>resolution</b>                | 1 dot/cm water depth or better   |
| <b>depth scale</b>               | metric graduation pre-printed or printed automatically                                     |
| <b>recording width</b>           | ≥20 cm   |
| <b>paper length</b>              | ≥15 m  |
| <b>time scale</b>                | regular graduation pre-printed or printed automatically                                    |
| <b>recording speed</b>           | adjustable: off, 5 to 60 mm/minute   |
| <b>fix marker</b>                | under software control from PC, switch and contact   |
| <b>annotation</b>                | free text from PC, and annotation of scales and ranges.                                    |

The automatic annotation function should support generation and annotation of scale lines and the recording of essential settings on the chart paper. At least one annotation block shall be visible in the recording window

|                              |   |
|------------------------------|---|
| <b>power supply</b>          | 11 to 18 VDC or wider   |
| <b>ingress protection</b>    | the enclosure, connectors and cables shall be sturdy and splash proof |
| <b>operating temperature</b> | 0 to 50°C   |
| <b>humidity</b>              | 10 to 95%   |

### Accessories

- tool set
- standard spares
- bar check device with graduated chain
- staff gauges

## **Consumables**

- 15 rolls of recording paper or equivalent printer paper sheets
- adequate spare pens, styli, ink cartridges (instrument dependent) to fully utilise the specified number of paper rolls at the lowest paper speed.

# SOUND VELOCITY CALIBRATOR

## Purpose

The sound velocity calibrator measures sound velocity in water. It is used to calibrate the sound velocity setting of high accuracy hydrographic echosounders. In particular in stratified water the speed of sound may vary over depth. Especially under such conditions, the calibrator is effective to increase echosounder accuracy.

## Conditions and Requirements

- The instrument shall be of such a design that it operates reliably and accurately under the prevailing environmental and operational conditions.
- The instrument shall be easy to operate and maintain.
- The instrument shall be supplied with the accessories as needed for effective deployment.
- All materials on the instrument exterior shall be non-corrosive.
- The above water enclosure, cables and connectors shall be sturdy and IP65 compliant.
- All submersed components, including sensor, connector (if any) and cable shall be sturdy and compliant with IP68 up to a depth of more than 100 m.
- The instrument shall be of a rugged design that can cope with the prevailing shock and vibration as experienced in mobile operations and during transport.
- The instrument shall have an expected technical lifetime of not less than 10 years.
- Operating and maintenance manuals related to the type and model of the instrument, shall be part of the delivery.
- Power supply shall be from standard batteries.
- The displayed values shall not depend on supply voltage.
- A control unit with integrated display shall be connected to the submersible sensor by electrical cable.
- The sound velocity readings shall be digitally displayed on the control unit.

## Specifications

### 1. Sensor

|                       |                            |
|-----------------------|----------------------------|
| <b>accuracy</b>       | ≤1 m/s                     |
| <b>velocity range</b> | fresh/saltwater; 0 to 40°C |
| <b>sampling time</b>  | <5 seconds                 |
| <b>minimum depth</b>  | ≤1 m                       |
| <b>maximum depth</b>  | ≥100 m                     |
| <b>cable length</b>   | ≥25 m                      |

### 2. Control unit

|                              |  |
|------------------------------|--|
| <b>power supply</b>          | standard dry cell(s), e.g. AA, C or D size |
| <b>battery autonomy</b>      | ≥10.000 readings                           |
| <b>display</b>               | good readability in daylight               |
| <b>displayed units</b>       | m/s  |
| <b>resolution</b>            | ≤0.1 m/s                                   |
| <b>operating temperature</b> | 0 to 50°C                                  |
| <b>humidity</b>              | 10 to 95%                                  |
| <b>enclosure</b>             | sturdy, portable, splash proof             |

# DIFFERENTIAL GPS

## Purpose

The Differential Global Positioning System (DGPS) will be used for accurate position fixing during bathymetric surveying and for general-purpose hydrographic applications.

## Conditions and Requirements

- The system shall be of such a design that it operates reliably and accurately under the prevailing environmental and operational conditions.
- The system shall be easy to operate and maintain.
- The system shall be supplied with the accessories as needed for effective deployment.
- All materials on the system exterior shall be non-corrosive.
- All enclosures, cables and connectors shall be sturdy and compliant with IP65.
- The system shall be of a rugged design that can cope with the prevailing shock and vibration as experienced in mobile operations.
- The system shall have an expected technical lifetime of not less than 10 years.
- Operator's and technical manuals, related to the type and model of the system, shall be part of the delivery.
- Power consumption shall be moderate, to be derived from a standard car-battery
- The system shall comprise
  1. a portable reference station with a GPS receiver, a digital radio link (radio modem) and matching antennas, and
  2. a portable mobile station with a GPS receiver, a digital radio link (radio modem) and matching antennas.
- The system shall generate alert messages in case the GPS data quality deteriorates beyond required accuracy and reliability and also in case of failures at the reference station. Causes can be bad satellite configuration, ionospheric activity, data link failure and similar.
- A digital radio link shall be included to deliver the pseudo range correction data to the mobile station.
- Preferably, the digital radio link includes voice communication support (voice radio link), possibly over an analogue channel on the same radio.
- The DGPS is to be deployed on reservoirs with a maximum dimension of about 80 km. The digital radio link shall be capable to cover the full range, i.e. from the reservoir dam to the end of the reservoir.

## Specifications

### 1. Reference Station

|                                 |  |
|---------------------------------|--|
| <b>GPS receiver channels</b>    | ≥8 parallel  |
| <b>tracking characteristics</b> | L1 C/A code and carrier                              |
| <b>antenna</b>                  | external compact dome                                |
| <b>antenna cable</b>            | ≥12 m, low loss type for the GPS frequencies         |
| <b>display</b>                  | built in display for set-up, control and supervision |
| <b>keypad</b>                   | for set-up and control                               |

## 2. Mobile Station

|                                 |  |
|---------------------------------|--|
| <b>GPS receiver channels</b>    | ≥8 parallel  |
| <b>tracking characteristics</b> | L1 C/A code and carrier                              |
| <b>antenna</b>                  | external compact dome                                |
| <b>antenna cable</b>            | ≥12 m, low loss type for the GPS frequencies         |
| <b>display</b>                  | built in display for set-up, control and supervision |
| <b>keypad</b>                   | for set-up and control                               |

## 3. Digital radio link

|                                  |   |
|----------------------------------|---|
| <b>radio frequency</b>           | VHF (or UHF band)   |
| <b>transmitting power</b>        | enough to reliably cover the reservoir completely,<br>e.g. ≥5 W for medium sized reservoirs |
| <b>reference station antenna</b> | directional Yagi  |
| <b>mobile station antenna</b>    | omni-directional, co-linear   |
| <b>antenna cable</b>             | ≥12 m, low loss type for the radio modem frequencies  |
| <b>corrections</b>               | RTCM SC104 V2   |
| <b>update rate</b>               | ≥1/s  |

## 4. General

|                                |  |
|--------------------------------|--|
| <b>DGPS accuracy</b>           | <1 m (95% confidence level)                |
| <b>position update rate</b>    | ≥1/s                                       |
| <b>data output</b>             | ASCII, USB and/or serial RS232, ≥9600 baud |
| <b>data storage (optional)</b> | 2 PCMCIA cards of ≥4 Mb                    |
| <b>power supply</b>            | 11 to 18 VDC or wider                      |
| <b>enclosure, connections</b>  | compliant with IP65                        |
| <b>operating temperature</b>   | 0 to 60°C                                  |
| <b>operating humidity</b>      | 0 to 100%                                  |

## Accessories

- power cords
- RS232 cables
- AC adapters (220 VAC ± 25%, 47 – 53 Hz)
- external keypad and display, e.g. by dedicated hand held terminal
- data logging storage capacity, e.g. on PCMCIA card(s)



# SURVEY PC

## Purpose

The bathymetric data collection process shall be controlled by a Survey PC. The PC acquires data from the DGPS and the echosounder, further it provides the operator and the helmsman with status and controlling information. All collected data are recorded on PC hard disk.

## Conditions and Requirements

- The Survey PC shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered during travel and operations.
- The Survey PC is intended for mobile use, therefore it shall be of a robust design.
- The Survey PC shall be shock, moisture and dust resistant.
- The Survey PC shall be easy to operate and maintain.
- The Survey PC shall be supplied with the accessories as needed for an effective bathymetric surveying application.
- The Survey PC shall have an expected technical lifetime of not less than 5 years.
- The Survey PC shall be capable to operate without any servicing.
- The data shall be collected via serial interfaces, connected to the data acquisition equipment, viz.: a hydrographic echosounder and a DGPS. A USB interface is preferred, on the condition that the interface is reliable and supported by the software, echosounder and DGPS.
- The laptop PC shall meet the interfacing requirements for the hardware, viz.: echosounder, DGPS and helmsman display. Further, an external keyboard and an external mouse shall be supported. The Survey PC shall be fitted with all the required interfaces and connectors. It should be noted that the PCMCIA slots are regarded too vulnerable for field use.
- The operating system and the data collection software shall support all required interfaces, including expansions.
- Operator's and technical manuals related to the type and model of the Survey PC, the interfaces, the accessories and software shall be part of the delivery. This is quite important, as on board (site) adjustments to the PC/interfaces may be required.

## Specifications (still to be adjusted)

|                        |  |
|------------------------|--|
| <b>CPU type</b>        | Pentium III, $\geq 450$ MHz                    |
| <b>internal memory</b> | $\geq 64$ Mbytes SDRAM                         |
| <b>cache memory</b>    | $\geq 512$ Kbytes L2 cache                     |
| <b>hard disk</b>       | $\geq 2$ Gbytes UATA HDU                       |
| <b>PC card slots</b>   | 2 Type II or 1 Type III slot                   |
|                        | integrated PCI bus 64 bit graphics accelerator |
|                        | PCI bus master EIDE onboard                    |
| <b>FDD</b>             | 1 1.44 MB FDD                                  |
| <b>parallel port</b>   | 1 EPP / ECP, bi-directional                    |
| <b>serial port</b>     | $\geq 2$ fast serial ports (not PCMCIA!)       |
|                        | 1 PS/2 port                                    |
|                        | 1 USB (Universal Serial Bus) port              |
|                        | 1 IrDA 1.1 compatible or more recent           |
| <b>video port</b>      | output for external display                    |
| <b>video memory</b>    | $\geq 2$ Mbytes                                |
| <b>pointing device</b> | touch pad and mouse                            |
| <b>keyboard</b>        | standard laptop layout                         |

|                              |  |
|------------------------------|--|
| <b>display technology</b>    | TFT  |
| <b>brightness</b>            | good readability in daylight conditions  |
| <b>resolution</b>            | 800 x 600 or better  |
| <b>battery type</b>          | Lithium-ion, rechargeable  |
| <b>battery autonomy</b>      | ≥2 hours   |
| <b>power management</b>      | APM support  |
| <b>mass</b>                  | <4 kg including power adapter  |
| <b>power supply</b>          | 220 VAC ±25%; 47 to 53 Hz  |
| <b>car battery adapter</b>   | 11 to 18 VDC, of sufficient current capacity to reliably meet the power requirements of the laptop PC during field use |
| <b>operating temperature</b> | 10 to 50°C   |
| <b>humidity</b>              | 10 to 90 % RH  |

**Components to be supplied along side**

- external bus mouse, MS supported, mouse pad
- carrying case adequate to protect the laptop PC during field trips by jeep.

**Operating system and software**

(operating system and software to be of the latest release)

|                                  |   |
|----------------------------------|---|
| <b>operating system</b>          | MS-Windows98 on CD-ROM or later version   |
| <b>additional software</b>       | MS-Office97 professional, including WORD, EXCEL, ACCESS, PowerPoint or later version  |
| <b>virus protection software</b> | McAfee, Norton or Dr. Solomon, the software shall be compatible with the operating system and including a site licence with up-grade provision. |

# BATHYMETRIC SOFTWARE

## Purpose

The bathymetric software is required to control the data collection processes and to inform the operator and the helmsman during surveying. Further, it supports data storage, validation, processing and presentation. End products are a depth contour chart, a data file with validated x,y,z data and, optionally a Digital Terrain/Elevation Model. Primary application is assessment of storage capacity of reservoirs and monitoring of sedimentation and erosion in reservoirs.

A Survey PC controls the bathymetric data collection process. The bathymetric software assists the operator with the planning of the survey. Data are acquired from the DGPS and the echosounder. The operator and the helmsman get status and controlling information presented. All collected data are recorded on PC hard disk.

Further, the software supports pre-survey planning, data handling, editing, processing, analysis and reporting.

## Conditions and Requirements

- The bathymetric software shall be of such a design that it operates reliably and accurately under the prevailing working conditions on board of small craft and during post-processing in a remote office.
- The bathymetric software shall be Windows 98 (or its successor) based, and shall be easy to operate and maintain.
- The bathymetric software shall be supplied with the accessories as needed for effective application.
- All bathymetric software and files shall be compatible with the PC hardware and MS-Windows98 (or its successor) environment.
- The bathymetric software shall be of a robust design.
- Comprehensive operating and system manuals, related to the bathymetric software, shall be part of the delivery.
- The manuals shall also give in depth explanation of the basics and principles of bathymetric surveying and (D)GPS use.
- The bathymetric software package shall be widely accepted and adequate for preparation and execution of bathymetric surveys and the processing and presentation of the collected data.
- The bathymetric software shall have a facility to generate helmsman data. These data shall be shown on a dedicated display, i.e. both operator and helmsman use a separate display. A low power and easily readable LCD display or TFT shall be used. The helmsman display shall be part of the delivery.
- The bathymetric software shall support data conversion to connect the collected depth data to MSL.
- The software shall support grid/projection conversion from and to the most common grids/projections. In particular, local grid, UTM, WGS84 and the common Indian projections shall be supported.
- It shall be possible to operate data collection and data processing software separately, on different computers.

- The bathymetric software shall support NMEA-0183 compatible devices. The software shall provide device drivers to support a wide range of echosounders, DGPS, digitizers, plotters, scanners, etc.
- The bathymetric software shall support a wide range of echosounders and the communication standards used by GPS equipment.
- The bathymetric software shall have tools for editing the collected files, to rectify and validate the data.
- The data collection, editing, validation and processing functions shall be supervised by Quality Assurance functions.

## Specifications

The **data collection** software shall support following functions:

1. run-line preparation
2. on line datum conversion
3. collecting, processing and storing of data from the DGPS positioning system and the echosounder
4. data storage by increments of sailed distance (fix by distance interval)
5. monitoring of data acquisition related quality indicators; in particular the performance of the DGPS (HDOP, functioning of the differential mode etc.), the echosounder and the track keeping of the helmsman
6. accurate time stamping of collected data, i.e. better than 0.05 s
7. generation of annotation text for the echosounder
8. helmsman guidance by left right indication, track searching and depth information on a helmsman display, L/R indicator reversible
9. presentation of process information and providing controls to the operator
10. generation of alerts to the operator in case of echosounder and/or DGPS problems

The **data processing** software will be executed off-line. It shall support following functions:

1. combination of survey data from different files, sessions and formats
2. addition of shorelines and landmarks to the data sets and inclusion of the same in the produced maps/charts
3. digitising of paper based topographical data (maps, charts)
4. free zooming and panning of maps, charts and plots
5. drafting of 'sailed track' (depth) plots
6. generation of depth number charts
7. spike/outlier/error detection and editing supported by graphics
8. generation of TIN model and interpolation to rectangular grid
9. generation of depth contours plots
10. assessment of reservoir capacity versus depth
11. assessment of erosion and sedimentation changes (comparison with previous/other data sets). The changes shall be presented as an overlay on the depth contour map and on a 'changes map'. Areas of sedimentation, erosion and of no change should be clearly indicated.
12. assessment of net sedimentation/erosion versus depth

# SURVEY BOAT

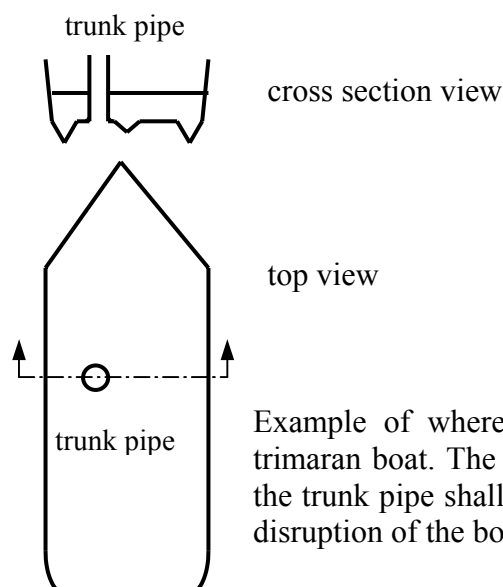
## Purpose

The survey boat will be used for bathymetric surveying to monitor reservoir sedimentation. Other applications include surveying in rivers and canals and discharge measurements by current meter and ADCP.

## Conditions and Requirements

- The boat shall be of such a design that it operates reliably and safely under the prevailing environmental and hydraulic conditions.
- The boat shall be squall resistant.
- The boat shall have a drain-off system and a self-draining cockpit to prevent any free water surface in the boat and related stability problems or damage to the equipment.
- The boat shall be capable to operate in shallow water where repeatedly the hull may impact with rock or sediment.
- All materials on the boat exterior and on wet spots inside the boat shall be non-corrosive.
- The boat shall be very sturdy, unsinkable and shall have an adequate stability.
- The boat shall have a slightly catamaran or trimaran shaped hull.
- The boat shall be easy to operate and maintain.
- All hull sections shall be accessible from the inside for quick repair of damage to the hull. The float material shall be removable to give access to the hull.
- The boat shall have an expected technical lifetime of not less than 10 years.
- The boat shall have floatation chambers filled with closed cell foam.
- The boat shall be provided with appropriate fenders.
- The boat's joints shall be designed to avoid leakage while taking into account the hostile environment of operation e.g. shallow water, high flow rate, floating debris, high sediment loads.
- The boat shall have a cabin to accommodate equipment and staff.
- The cabin shall, at port and starboard sides, have sitting benches.
- The cabin shall have provisions to safely install and operate the following equipment: echosounder, DGPS system, laptop PC, helmsman display, power supply with car batteries.
- The cabin shall have a stable table for the system operator, to spread maps and paper charts, to make notes etc.
- The cabin shall have windows and a lockable door.
- On the rear deck, a workspace of approximately 3 m length over the full width of the boat shall be available to carry out hydrological measurements.
- The rear deck shall be provided with an awning.
- The boat shall be supplied with the accessories as needed for effective deployment.
- The boat shall be equipped with two outboard engines.
- The boat and the outboard engines shall be capable to operate for at least 6 months without any servicing.
- The outboard engines shall be operated by a remote control system, located at the stern side front bulkhead in the cabin.
- The control system shall have a starting switch, gear switch and a throttle system for each outboard engine and a steering wheel and emergency stop switch for simultaneous operation of the outboard engines.
- The control system shall match the outboard engines.
- Guard rail and stanchions with detachable chain will be rigged out around the deck .
- Arrangements shall be made for safe working on the boat.

- Bollards are to be provided on the deck for mooring purpose.
- A maintenance manual, related to the type and model of the boat, shall be part of the delivery.
- The boat shall be fitted with a transducer trunk pipe (transducer well).
- The internal diameter of the trunk pipe shall be sufficient to pas both the high frequency echosounder transducer and a low frequency echosounder transducer or an ADCP.
- It shall be easy to install or recover the transducers and/or the ADCP.
- The transducer trunk pipe shall be installed off centre by about 1/6 of the boat width left or right of the centre line on a trimaran shape hull and in the centre on a catamaran hull. In forward/backward direction, it may be in the middle of the boat.
- The transducer trunk pipe shall have a top cover to avoid water entering the boat, in particular while sailing.
- The top cover shall pass the transducer rod and its cable but prevent water to enter the boat.
- The transducer trunk pipe shall be at least as high as the sideboards of the boat.
- The transducer trunk pipe shall be flush with the boat hull, it shall not protrude below the boat hull.
- The trunk pipe shall be tightly fixed to the boat and shall be properly supported.
- The trunk pipe shall be waterproof, corrosion proof and very sturdy. The trunk pipe shall be so constructed that it cannot break off, tear apart or suffer any other damage that may result in water entering (seeping or flushing) into the boat.
- At the lower end of the trunk pipe, a bottom lid or dummy transducer shall close the trunk pipe during fast sailing. The trunk pipe lid shall be smoothly fitted in the curved shape of the hull; i.e. it should not disrupt the flow of water along the hull.
- The bottom lid shall be easily installable/removable from above through the trunk pipe, while the boat is floating.
- The transducer and support rod shall be vertically adjustable and also removable.
- The transducer and its support rod shall be tightly fixed in the trunk pipe to avoid vibrations during sailing.
- It shall be possible to immerse the transducer deeper than the lower end of the transducer trunk pipe.



Example of where the trunk pipe could be mounted in a slightly trimaran boat. The sketch is not to scale. In a catamaran shaped boat, the trunk pipe shall be installed in or close to the centre line, avoiding disruption of the boat's structural design.

## Specifications

|  |  |
|--|--|
| <b>1. Boat</b>   |  |
| <b>material</b>  | FRP (Fibre Reinforced Plastic) or aluminium  |
| <b>length</b>  | ≥7.5 m   |
| <b>width</b>   | ≥ 2.5 m  |
| <b>draft</b>   | ≥ 0.5 m  |
| <b>free board</b>  | ≥. 0.6 m   |
| <b>bottom shape</b>  | slightly catamaran or trimaran or flat   |
| <b>propulsion</b>  | 2 Nos. of ≥30 kW ≥(40 HP) outboard engines. Cruising speed shall be 20 knots or more (planing) with full load. |
| <b>carrying capacity</b>   | ≥1000 kg   |
| <b>2. Cabin</b>  |  |
| <b>length</b>  | ≥ 2.75 m   |
| <b>height</b>  | ample sitting height   |
| <b>door</b>  | lockable   |
| <b>door width</b>  | >0.8 m   |
| <b>3. Boat outfit</b>  |  |
| <b>anchor</b>  | matching the boat, fitted with sufficient rope to safely anchor in the deepest reservoir of the State          |
| <b>echosounder</b>   | indicator type for navigation purposes, fitted in the boat   |
| <b>compass</b>   | magnetic type for navigation purposes, fitted in the boat  |
| <b>fenders</b>   | ≥4 of Coir type  |
| <b>paddles</b>   | ≥4 for rowing  |
| <b>life jacket</b>   | ≥8 for each person on board, also for guests (SOLAS approved type)   |
| <b>life buoy</b>   | ≥2 pieces, one on SB and one on BB, with at least 50 m line, readily available on board                        |
| <b>fire extinguisher</b>   | ≥2 pieces, net weight ≥5 kg  |
| The fire extinguishers shall be readily accessible close the outboard engines and in the cabin |  |

## Remarks

For Indian bidders, the Registrar of Shipping, Mumbai, shall approve the design and drawing. For international bidders the design and drawing shall be approved by a national agency in their country authorised for the purpose and acceptable to the purchaser.

# BOAT TRAILER

## Purpose

The boat trailer will be used to transport the survey boats to and from measuring sites.

## Conditions & Requirements

- The boat trailer shall be of such a design, that the boat can be transported reliably and safely by road, to very remote sites.
- The trailer shall be very sturdy.
- The trailer shall be immersible for loading and unloading of the boat, hence all materials shall be corrosion resistant. In particular electrical parts and bearings shall be protected against ingress of water.
- The trailer shall be easy to use and maintain.
- The trailer shall be supplied with the accessories as needed for effective use.
- The trailer shall be supplied with a spare wheel with tyre, securely fixed at an easily accessible spot.
- The trailer shall have an expected technical lifetime of not less than 10 years.
- The trailer shall have adequate and strong provisions to secure the boat.
- The trailer shall have ample and large supports fitting the shape of the boat's hull.
- The trailer shall have a safety chain to attach it to the pulling car.

## Specifications

### 1. Trailer

|                   |   |
|-------------------|---|
| <b>material</b>   | galvanised iron   |
| <b>capacity</b>   | sufficient to carry the boat with engines, petrol, tools etc. |
| <b>dimensions</b> | matching the size of the boat                                 |

### 2. Trailer outfit

|                         |   |
|-------------------------|---|
| <b>winch</b>            | with ratchet and pawl for pulling the boat onto the trailer   |
| <b>guidance rollers</b> | rubber, fitting to the shape of the boat  |
| <b>lights</b>           | removable assembly of taillights viz. red tail lights, red break-lights and orange left and right direction indicators. |
| <b>spare tyre</b>       | spare wheel with tyre   |



# OUTBOARD ENGINE

## Purpose

Two outboard engines are to propel the survey boat during bathymetric data acquisition. The boat will be operated at surveying speed and at travel speed. In large reservoirs, the outboard engines should have sufficient capacity to maintain a planing cruising speed of at least 20 knots.

## Conditions and Requirements

- The outboard engine shall be of such a design that it operates reliably and safely under the prevailing environmental and hydraulic conditions as encountered during bathymetric surveying on small, medium and large reservoirs.
- The outboard engine will be used in sediment and debris laden water.
- The outboard engine will be used in shallow water with a rocky bottom.
- The outboard engine shall be easy to operate and maintain.
- The outboard engine shall be supplied with the accessories as needed for effective use.
- All materials on the outboard engine shall be non-corrosive.
- The outboard engine shall have an expected technical lifetime of not less than 5 years.
- The outboard engine shall be very sturdy.
- Operator's and maintenance manuals, related to the type and model of the outboard engine, shall be part of the delivery.
- The design of the cooling system shall be sediment and debris tolerant.
- The propeller and tail shall be impact resistant.
- The propeller shall be fitted with an adequate type of breaking pin.
- The outboard engine shall have a provision for lifting and to adjust its trimming.
- The outboard engines shall be operated by a remote control system, located at the stern side bulkhead of the cabin.
- The control system shall have a starting switch, gear switch and a throttle system for each outboard engine and a steering wheel and emergency stop switch for simultaneous operation of the outboard engines.
- For a good serviceability, the outboard engines shall be of a commonly used brand in India.

## Specifications

|                    |  |
|--------------------|--|
| <b>capacity</b>    | ≥30 kW (≥40 HP)  |
| <b>operation</b>   | remote controlled twin engine, electric start          |
| <b>fuel</b>        | petrol   |
| <b>propeller</b>   | workhorse type, to be selected during trials with boat |
| <b>tail length</b> | to match with boat                                     |
| <b>alarms</b>      | over heating, oil pressure                             |

## Accessories

All listed accessories are to be delivered for each per outboard engine.

- toolkit
- ≥10 breaking pins
- ≥2 spare propellers
- maintenance instructions and manual
- petrol tank and hoses etc.

# BATTERY CHARGER

## Purpose

The battery charger will be used to charge lead acid batteries for field operations such as bathymetric surveying.

## Conditions and Requirements

- The battery charger will be used on shore and occasionally in a survey boat.
- The battery charger shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered during field operations.
- The battery charger is to be transported from the one operational site to the other, therefore it shall be of a robust design and shock resistant.
- The battery charger shall be easy to operate and maintain.
- The battery charger shall be supplied with the accessories as needed for an effective roving application.
- The battery charger shall have an expected technical lifetime of not less than 10 years.
- The battery charger shall be capable to operate for 6 months without any servicing.
- The cables and the connector clamps off the battery charger, shall be fully acid and corrosion proof.
- The battery charger shall not be damaged by interruptions in the mains power supply.
- After a mains power interruption, the battery charger shall recover and resume the charging upon return of mains power.
- The battery charger shall be short circuit proof.
- Operator's and technical manuals related to the type and model of the battery charger shall be part of the delivery.
- The battery charger shall be small and easy to transport.

## Specifications

|                                 |  |
|---------------------------------|--|
| <b>supported battery type</b>   | lead acid, 12 V nominal, maximum capacity 125 Ah     |
| <b>charging capacity</b>        | $\geq 12A$ , adjustable to battery type and capacity |
| <b>over charge protection</b>   | on battery charge and voltage                        |
| <b>trickle charging current</b> | approx. 1 A, adjustable to battery type and capacity |
| <b>overload current trip</b>    | approx. 15 A   |
| <b>dry mass</b>                 | $\leq 10$ kg   |
| <b>power supply</b>             | 220 VAC $\pm 5\%$ , 47 to 53 Hz, single phase        |
| <b>enclosure, connections</b>   | complying with IP 54 or better                       |
| <b>operating temperature</b>    | 0 to 50°C  |
| <b>operating humidity</b>       | 10 to 95%  |

## Accessories

- voltmeter
- load indicator
- $\geq 5$  metre mains power extension cable with  $\geq 4$  sockets

## Consumables

- fuses
- battery clamp connectors

# VOICE RADIO

## Purpose

The voice radio will be used during bathymetric surveying for communications between the surveying boat and the reference station. It is required for safety and operational reasons.

## Conditions and Requirements

- The voice radio shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered during field operations.
- The voice radio is to be transported from the one operational site to the other; therefore it shall be of a robust design and shock resistant.
- The voice radio shall be easy to operate and maintain.
- The reach of the voice channel shall at least be as large as that of the digital radio link.
- The voice radio shall be supplied with the accessories as needed for an effective use.
- The voice radio shall have an expected technical lifetime of not less than 10 years.
- The voice radio shall be capable to operate without any servicing.
- The cables and the connector clamps off the voice radio, shall be fully corrosion proof.
- The voice radio shall be reverse polarity protected.
- The connections of the voice radio, in particular the antenna connection, shall be short circuit proof.
- Operator's and technical manuals related to the type and model of the voice radio shall be part of the delivery.
- The voice radio shall be small and easy to transport.
- The voice radio shall be permitted in India.
- A user licence for the voice radio in the name of the purchaser shall be part of the delivery.

## Specifications

### 1. general

|                           |                         |
|---------------------------|-------------------------|
| <b>frequency range</b>    | VHF                     |
| <b>number of channels</b> | ≥10 (all pre-set)       |
| <b>channel spacing</b>    | ≤25 kHz                 |
| <b>type of operation</b>  | Simplex                 |
| <b>antenna</b>            | omni-directional (whip) |

### 2. transmitter

|                                   |   |
|-----------------------------------|---|
| <b>frequency stability</b>        | ±5 ppm  |
| <b>RF power output</b>            | full coverage of the largest reservoir, e.g. ≥5 W |
| <b>suppression</b>                | 50 dB minimum (spurious and harmonic)             |
| <b>adjacent channel power</b>     | ≤-55dBc   |
| <b>intermodulation distortion</b> | less than 25 dB corresponding PEP                 |
| <b>microphone impedance</b>       | 300 Ω (Unbalanced)                                |

### 3. receiver

|                                     |                         |
|-------------------------------------|-------------------------|
| <b>frequency stability</b>          | ±10 ppm                 |
| <b>sensitivity</b>                  | ≤0.3 uV for 12 dB SINAD |
| <b>adjacent channel selectivity</b> | 60 dB                   |
| <b>intermodulation</b>              | 60 dB                   |
| <b>IF rejection</b>                 | 60 dB minimum           |

|                               |                                |
|-------------------------------|--------------------------------|
| <b>image rejection</b>        | 60 dB minimum                  |
| <b>AF output</b>              | 0.5 W into 150 $\Omega$        |
| <b>power supply</b>           | 11 to 18 VDC or wider          |
| <b>enclosure, connections</b> | complying with IP 54 or better |
| <b>operating temperature</b>  | 0 to 50°C                      |
| <b>operating humidity</b>     | 10 to 95%                      |

### **Accessories**

- telephone hand set
- low loss coaxial cable; 12 m per radio set

# PORTABLE GENERATOR

## Purpose

The portable generator is to deliver power for field operations such as bathymetric surveying, running water sampling and discharge measurements. The generator may be used for battery charging and to deliver power to a UPS. All mains powered devices, if any, will be connected to the UPS.

## Conditions and Requirements

- The generator will be used in a roving mode, being moved from one site of operation to the other.
- The generator will be used in a survey boat, field vehicle and on shore.
- The generator shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered during transport and field operations.
- The generator is intended for mobile use, therefore it shall be of a robust design.
- The generator shall be shock, moisture and dust resistant.
- The generator shall be easy to operate and maintain.
- The generator shall be supplied with the accessories as needed for an effective roving application.
- The generator shall have an expected technical lifetime of not less than 5 years.
- The generator shall be capable to operate for 1 month without any servicing.
- Operator's and technical manuals related to the type and model of the generator shall be part of the delivery.
- The generator shall be small and easy to transport, e.g. by wheelbarrow.
- A tool set for maintenance and simple repair and including a checklist of do's and don'ts shall be part of the delivery.

## Specifications

|                           |   |
|---------------------------|---|
| <b>engine</b>             | air-cooled petrol engine  |
| <b>output</b>             | 220 VAC $\pm$ 5%, 47 to 53 Hz, single phase                       |
| <b>capacity</b>           | as required by the load with at least 25% overload surge capacity |
| <b>size</b>               | sum of length, width and height less than 200 cm                  |
| <b>dry mass</b>           | $\leq$ 50 kg  |
| <b>fuel consumption</b>   | $\leq$ 0.4 kg/(kWh)   |
| <b>fuel tank capacity</b> | for at least 2 hours of continuous full load operation            |
| <b>starting method</b>    | manual starting   |
| <b>exhaust</b>            | silencer with muffler   |
| <b>environment</b>        | ingress protection complying with IP 54 or better                 |

## Accessories

- frequency indicator
- voltmeter
- load indicator
- $\geq$ 5 metre extension cable with  $\geq$ 4 AC sockets.

## Consumables

- fuel filter
- spark plug
- oil filter
- engine oil
- fuses

# UN-INTERRUPTABLE POWER SUPPLY

## Purpose

The Un-interruptable Power Supply (UPS) is primarily intended to protect electrical devices, mostly PCs, printers and other peripherals, against the effects of power interruption. In some cases, it may also be required to sustain the power supply during a considerable time to avoid production loss.

## Conditions and Requirements

- The UPS shall be of such a design that it operates reliably and accurately under the prevailing environmental and power supply conditions.
- The UPS shall be easy to operate and maintain.
- The UPS shall be supplied with the accessories as needed for effective application.
- The UPS shall have an expected technical lifetime of not less than 10 years.
- The UPS shall be capable to operate at least 6 months without any servicing.
- An operator's manual, related to the type and model of the UPS, shall be part of the delivery.
- The UPS shall react swiftly on load changes maintaining output voltage within narrow specifications.
- The UPS shall feature surge protection against damage to very high input voltages and spikes.
- The UPS shall be of a low noise or inaudible type

## Specifications

### 1. General

|                   |  |
|-------------------|--|
| <b>type</b>       | on line  |
| <b>capacity</b>   | ≥1 kVA   |
| <b>protection</b> | input line fuse<br>overload<br>short circuit                                   |
| <b>indicators</b> | power on<br>load bar graph<br>charge/discharge<br>mains failure acoustic alarm |
| <b>MTBF</b>       | ≥10000 hours (Mean Time Before Failure)  |

### 2. Performance

|                                 |   |
|---------------------------------|---|
| <b>cut-off input voltage</b>    | 160 to 280 VAC, 47 to 53 Hz   |
| <b>switch over to batteries</b> | <175 VAC and >265 VAC   |
| <b>output</b>                   | 220 VAC ±5%, 47 to 53 Hz ±1%  |
| <b>backup time</b>              | ≥60 minutes   |
| <b>inverter efficiency</b>      | >85%  |
| <b>overload</b>                 | 110% continuous<br>120% ≥30 minutes<br>150% ≥1 minute<br>200% ≥1 second |

### 3. Batteries (Internal)

|                     |  |
|---------------------|--|
| <b>DC voltage</b>   | ≥48 V  |
| <b>charge modes</b> | trickle and boost charge   |
| <b>protection</b>   | reverse polarity connection<br>over-charge<br>too deep depletion |

# OFFICE COMPUTER

## Purpose

The PC will be used for general-purpose hydrological, reporting and office applications.

## Conditions and requirements

- The PC shall be of such a design that it operates reliably under the prevailing environmental and power supply conditions as encountered in the bathymetry data processing office.
- The PC shall be easy to operate and maintain.
- The PC shall be supplied with the accessories as needed for effective use.
- All hardware shall be accompanied by the software and drivers that are required for installation and application of the hardware.
- The PC shall have an expected technical lifetime of not less than 5 years.
- The PC shall be capable to operate without any servicing.
- Operator's manuals and technical documentation of all hardware, including PC and peripherals, shall be part of the delivery.
- All software manuals of the installation software, operating system, utilities and applications software shall be part of the delivery.
- The video controller shall match the display specifications.
- The monitor shall deliver bright and easily viewable images.
- The pixels shall be sharp without smearing to adjacent pixels and have a high contrast ratio.
- A CD-Recorder shall be part of the delivery. The recorded CD's shall be fully compliant with the related CD standard.
- The recorded CD's shall be free of errors and fully readable by the CD readers of the portable PCs and the office PCs.

## Specifications

### 1. PC

|                         |   |
|-------------------------|---|
| <b>CPU type</b>         | Pentium III, $\geq 450$ MHz<br>440BX AGPset or better                           |
| <b>internal memory</b>  | $\geq 64$ Mbytes $\geq 133$ MHz SDRAM (PC-133), expandable to $\geq 256$ Mbytes |
| <b>cache memory</b>     | $\geq 512$ kbytes L2 cache  |
| <b>hard disk</b>        | $\geq 6.0$ Gbytes Ultra ATA HDU   |
| <b>CD ROM</b>           | $\geq 32X$ speed, either internal or external                                   |
| <b>free slots</b>       | $\geq 2$ PCI, $\geq 1$ ISA, $\geq 1$ AGP  |
| <b>FDD</b>              | 1 1.44 MB FDD   |
| <b>parallel port</b>    | 1 EPP / ECP, bi-directional   |
| <b>serial port</b>      | $\geq 1$ fast serial port<br>$\geq 1$ USB port                                  |
| <b>mouse port</b>       | 1 bus mouse port  |
| <b>video controller</b> | AGP with $\geq 8$ Mbytes memory (expandable to $\geq 16$ Mbytes)                |



## 2. Colour monitor

|                |                                      |
|----------------|--------------------------------------|
| size           | ≥17"                                 |
| pixels         | ≥1024 x 768                          |
| video standard | XGA/VESA 1024 or better              |
| CD-Recorder    | ≥6 x (Recordable); ≥4 x (Rewritable) |

|                       |                           |
|-----------------------|---------------------------|
| power supply          | 220 VAC ±25%; 47 to 53 Hz |
| operating temperature | 10 to 45°C                |
| humidity              | 10 to 80%                 |

### Components to be supplied along side

- Windows keyboard
- bus-mouse, MS supported
- mouse pad

### Operating system and software

- MS-Windows98 installed and on CD-ROM, latest version
- MS-Office97 professional, including WORD, EXCEL, ACCESS, PowerPoint (on CD-ROM, latest version)

### Virus protection software

- virus protection software: McAfee, Norton or Dr. Solomon  
The virus protection software shall be compatible with the operating system and shall include a site licence with up-grade provision.

# CD RECORDER

## Purpose

The CD-recorder will be used to transport the collected surveying data files from the surveying boat to the office. Further, the CD-recorder will be used for backup, archiving and data exchange purposes.

## Conditions and requirements

- The CD-recorder shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered in the field, on board and in office.
- The CD recorder shall be of portable type to be used with a Survey PC.
- The CD-recorder shall be rugged and shock resistant.
- The CD-recorder shall be easy to operate and maintain.
- The CD-recorder shall be supplied with the accessories as needed for effective use.
- All supply and signal cables required to effectively use the CD-recorder shall be part of the delivery.
- Adequate and sturdy power supply devices as required for operation from mains and car battery power shall be part of the delivery.
- The CD-recorder shall have an expected technical lifetime of not less than 5 years.
- The CD-recorder shall support recording of Write Once and Rewritable media.
- The CD media shall have an expected lifetime of more than 20 years.
- The CD-recorder shall be capable to operate without any servicing.
- An operator's manual, related to the type and model of the CD-recorder, shall be part of the delivery.
- The CR-recorder, its interface and software shall be compatible with the field and office PCs and allow for reliable and un-interrupted recording.

## Specifications

### Hardware

|                              |  |
|------------------------------|--|
| <b>speed</b>                 | ≥4CD-R; ≥2 CD-RW   |
| <b>media</b>                 | CD-R and CD-RW   |
| <b>interface</b>             | EPP / ECP, bi-directional or USB                               |
| <b>housing</b>               | external, portable   |
| <b>power supply</b>          | 220 VAC ±25%; 47 to 53 Hz (in office)<br>11 to 18 VDC or wider |
| <b>operating temperature</b> | 10 to 45°C   |
| <b>humidity</b>              | 10 to 80%  |

### Software

In order to optimise the data storage efficiency, software for file selection, data compression and reporting purposes shall be implemented. The software at least shall support:

- manual file selection
- automatic file selection based on file inclusion and exclusion parameters, folder inclusion/exclusion
- file age limiting, i.e. files of older age may be ignored
- full and incremental backup support
- standard data compression technology
- error monitoring, control and recovery
- reporting functions

# PLOTTER

## Purpose

The plotter is primarily intended to output graphical data on sheet materials. Typical applications are output of GIS data, e.g. maps, charts and data analyses results.

## Conditions and Requirements

- The plotter shall be of such a design that it operates reliably and accurately under the prevailing environmental and power supply conditions.
- The plotter shall be easy to operate and maintain.
- The plotter shall be supplied with the accessories as needed for effective application.
- The plotter shall have an expected technical lifetime of not less than 10 years.
- The plotter shall be capable to operate at least 6 months without any servicing.
- Reservoirs for ink and/or dye shall be easily replaceable.
- An operator's manual, related to the type and model of the plotter, shall be part of the delivery.

## Specifications

### 1. General

|                          |   |
|--------------------------|---|
| <b>paper sizes</b>       | A4 to A3  |
| <b>absolute accuracy</b> | ≤0.25 mm of any point                               |
| <b>resolution</b>        | ≥300 dpi colour<br>≥600 dpi monochrome              |
| <b>plotting method</b>   | raster (pen type is not effective for colour fills) |

### 2. Data formats

|               |                          |
|---------------|--------------------------|
| <b>vector</b> | HPGL (1 and 2), BGL, VDF |
| <b>raster</b> | HPRTL, TIFF 5.0          |
| <b>other</b>  | Postscript               |

### 3. Auxiliary

|                              |   |
|------------------------------|---|
| <b>interfaces</b>            | LAN (shall match the purchasers network);<br>EPP / ECP, bi-directional or USB |
| <b>serial</b>                | USB and/or RS232; ≥9600 baud  |
| <b>memory</b>                | ≥16 MB, expandable to 64 MB   |
| <b>power supply</b>          | 220 VAC ±25%; 47 to 53 Hz   |
| <b>operating temperature</b> | 10 to 45°C  |
| <b>humidity</b>              | 10 to 80%   |

# PRINTER

## Purpose

The printer is primarily intended to output text and graphical data on paper and sheet materials. Typical applications are common office use, reporting, and output of hydrological data, GIS data and the like.

## Conditions and Requirements

- The printer shall be of such a design that it operates reliably and accurately under the prevailing environmental and power supply conditions.
- The printer shall be easy to operate and maintain.
- The printer shall be supplied with the accessories as needed for effective application.
- The printer shall have an expected technical lifetime of not less than 10 years.
- The printer shall be capable to operate at least 6 months without any servicing.
- Reservoirs for ink and/or dye shall be easily replaceable.
- An operator's manual, related to the type and model of the printer, shall be part of the delivery.

The purchaser may execute his judicious discretion in the choice of configuration and options.

## • LASER PRINTER, B/W, DESKTOP

### Specifications

|                              |  |
|------------------------------|--|
| <b>printing speed</b>        | ≥12 ppm                                    |
| <b>printing resolution</b>   | ≥600 x 600 dpi                             |
| <b>buffer capacity</b>       | ≥4 Mbytes, expendable to 8 Mbytes          |
| <b>printer language</b>      | MS-Windows compatible, enhanced PCL 5      |
| <b>fonts</b>                 | ≥20, and scaleable fonts                   |
| <b>serial</b>                | USB and/or serial RS232; ≥9600 baud        |
| <b>paper size</b>            | A4, letter, executive                      |
| <b>paper tray capacity</b>   | 100 sheets                                 |
| <b>paper types</b>           | plain paper, envelopes, and transparencies |
| <b>power supply</b>          | 220 VAC ±25%; 47 to 53 Hz                  |
| <b>operating temperature</b> | 10 to 45°C                                 |
| <b>humidity</b>              | 10 to 80%                                  |

### Consumables:

- toner cartridges
- A4 size paper

- **INKJET PRINTER, COLOUR, A4 SIZE**

**Specifications**

|                              |   |
|------------------------------|---|
| <b>printing speed</b>        | black $\geq 3$ ppm (A4), colour $\geq 1.5$ ppm (A4)               |
| <b>printing resolution</b>   | B/W $\geq 600 \times 600$ dpi<br>Colour $\geq 300 \times 300$ dpi |
| <b>printer language</b>      | MS-Windows compatible   |
| <b>fonts</b>                 | $\geq 20$ graphics and scaleable                                  |
| <b>interface</b>             | parallel  |
| <b>paper size</b>            | A4, A3, letter, executive   |
| <b>paper tray capacity</b>   | 100 sheets plain paper  |
| <b>paper types</b>           | plain paper, envelopes and transparencies                         |
| <b>power supply</b>          | 220 VAC $\pm 25\%$ ; 47 to 53 Hz                                  |
| <b>operating temperature</b> | 10 to 45°C  |
| <b>humidity</b>              | 10 to 80%   |

**Consumables**

- black ink cartridges
- colour ink cartridges
- A4 and A3 size paper

# TRAINING PROGRAMME FOR PERSONNEL

## Purpose

The training programme is intended for all personnel that are involved with the use and operation of the bathymetric system.

## Conditions and Requirements

- The training programme shall cover all aspects of the use and operation of the bathymetric system. After successful finishing of the training, the trainees shall be capable to execute the bathymetric survey independently.
- The training programme shall commence with an introduction in bathymetric surveying.
- The training programme shall cover all relevant aspects related to the GPS and in particular accuracy and conversion from WGS84 to UTM or other Datums
- The training programme shall cover all relevant aspects related to the echosounder and in particular practical aspects such as accuracy, calibration, assessment of hard bottom depth, multiple echo's, installation precautions, data interpretation.
- The training programme shall cover all relevant aspects related to the use and operation of the data acquisition hardware and software. In particular survey preparation, survey execution, calibration, data quality monitoring and verification, trouble shooting, post survey checks and data handling and safe guarding shall be covered.
- The training programme shall cover all relevant aspects related to the use and operation of the data processing and presentation software.
- The training programme shall assess safety precautions and communication methods.
- The training materials shall comprise printed handouts in clear language covering all the training subjects.
- The training shall be executed in a classroom and on board.
- All trainees shall be given the opportunity to work with the system in a classroom environment.
- After successful completion of the classroom training the field training shall be given.
- All trainees shall get the opportunity to practise in the field on a reservoir, collecting real data.
- The training shall be concluded with an exam and the successful trainees shall receive a certificate.
- The training materials shall be available for all trainees.

**ACCEPTANCE PROTOCOL FOR PROCUREMENT  
OF  
BATHYMETRY SYSTEMS**

# Acceptance Protocol

## General

The delivery of Bathymetric Equipment and Software shall be in compliance with the Technical Specifications. To formalise the process of delivery, an Acceptance Protocol is prescribed.

The Acceptance Protocol shall serve as a formal guidance during delivery of the Bathymetry Systems. Its primary goals are twofold.

1. Ascertain the delivery and completeness of all ordered products and related documents of the Bathymetric System (equipment and software).
2. Check the functioning of the Bathymetric System, individual components (equipment and software) and the integrated system, in a formal way against the Technical Specifications by application of Acceptance Tests. The tests also verify the accuracy and performance of the equipment and software.

The Acceptance Protocol shall be executed in close co-operation between the Supplier and the Purchaser.

Products shall be accepted only if they are complete and are functioning in compliance with the requirements and Technical Specifications of the bid document and the related documents are complete and correct. The supplier shall replace defective products and any other discrepancies within 4weeks after notice of complaint.

The acceptance of the integrated bathymetric systems shall focus on the items as presented in the Acceptance Evaluation Table, which is presented below. The aspects to assess are organised column wise.

Acceptance Evaluation Table

|    | Item                      | complete | manuals | functioning | up to spec | power | training |
|----|---------------------------|----------|---------|-------------|------------|-------|----------|
| 1  | echosounder               |          |         |             |            |       |          |
| 2  | sound velocity calibrator |          |         |             |            |       |          |
| 3  | DGPS                      |          |         |             |            |       |          |
|    | digital radio link        |          |         |             |            |       |          |
| 4  | data collection PC        |          |         |             |            |       |          |
| 5  | surveying software        |          |         |             |            |       |          |
|    | processing software       |          |         |             |            |       |          |
|    | helmsman display          |          |         |             |            |       |          |
|    | system integration        |          |         |             |            |       |          |
| 6  | training programme        |          |         |             |            |       |          |
| 7  | survey boat               |          |         |             |            |       |          |
| 8  | boat trailer              |          |         |             |            |       |          |
| 9  | outboard engine           |          |         |             |            |       |          |
| 10 | voice radio link          |          |         |             |            |       |          |
| 11 | battery charger           |          |         |             |            |       |          |
| 12 | portable generator        |          |         |             |            |       |          |
| 13 | UPS                       |          |         |             |            |       |          |



|    |                 |  |  |  |  |  |  |
|----|-----------------|--|--|--|--|--|--|
| 14 | office computer |  |  |  |  |  |  |
| 15 | CD-recorder     |  |  |  |  |  |  |
| 16 | plotter         |  |  |  |  |  |  |
| 17 | printer         |  |  |  |  |  |  |
| 18 | commissioning   |  |  |  |  |  |  |

## Execution

The Acceptance Protocol aims to ascertain the proper functioning of all items in compliance with the Technical Specifications. Failing to meet the Technical Specifications and Requirements, results in rejection of the items concerned until the deficiency has been remedied and the Technical Specifications and Requirements are met to the complete satisfaction of the Purchaser.

Qualified specialists, under responsibility of a test manager, shall execute the Acceptance Tests. The progress of the Acceptance Tests is monitored and supervised by the Purchaser and/or his authorised representative. After assessment of the test results, the Purchaser may conclude that tests have to be redone or additional tests are to be executed as he deems fit. The Purchaser's test party has the right of access to any item and may request any data or information at any time. The Supplier has the obligation to deliver requested information without delay; i.e. all collected test data and documents must be kept available at the test site.

All activities (what, when, where, who, which instrument, etc.) are to be annotated systematically and uniquely linked to the individual instruments.

For each of the Bathymetric Systems, the acceptance tests shall be executed at the Purchasers' premises. The final commissioning shall take place after installation of the integrated Bathymetric Systems on board of the Purchasers' survey boats, in each of the states.

### Test preparation

Prior to the execution of the Acceptance Test, the Supplier shall prepare a detailed test script to complete satisfaction of the Purchaser. The test script shall define:

- test sequence
- the test conditions and requirements for each test
- assistance by the Purchaser
- location of the test
- person(s) responsible for conducting the tests
- reporting requirements
- handling of failures and problems
- responsibilities of all parties involved

### Evaluation of results

The observations and data collected during execution of the Acceptance Protocol, have to be evaluated and results and conclusion shall be reported. Items that do not meet the bid specifications, shall be replaced by properly functioning and satisfactorily tested items of the same type.

The Acceptance Report lays down the observations and data collected during the execution of the Acceptance Protocol and is a formal document to record the acceptance or rejection of any item as covered in the Bid Document. The forms and checklists filled during the execution of the Acceptance Protocol are to be enclosed with the Acceptance Report. It is the

obligation of the Purchaser to provide the Supplier a signed copy of the Acceptance Report, as soon as all items of a tested Bathymetric System have passed the Acceptance Tests to the complete satisfaction of the Purchaser. The Supplier can use the signed Acceptance Report as proof that the items listed in the report were accepted.

Next Chapters give instructions for the acceptance procedure and test and verification requirements of each of the items. These instructions are not comprehensive but aim to guide the Supplier in the preparation of the Acceptance Test Plan.

## 1. Completeness

### • Item count

For each item, the completeness of the delivery is verified. The following parts will be assessed:

1. the item proper
2. cables, connectors
3. accessories
4. spares
5. manuals and guidelines
6. software dongles

### • Visual Inspection

Visual inspection includes the following activities.

- on all items visual check for damage, e.g. on cables, and housing
- availability of non-removable identification codes, e.g. serial number, type/model, manufacturer
- on each cable name/identification code, indication to which device it is to be connected, e.g. PC, echosounder, DGPS, Power Supply etc.
- the protection against wrongly connecting cables
- connectors, cable glands, cables and housing must be suitable for the environment of operation, be it submersed (IP68), on board (IP55) or exposed to the environment (IP65). In case of doubt, (all) items may be tested for compliance with the associated IP rating.

### • Documents

The following documents shall accompany the delivery of the instruments and software:

1. Administrative and QA documents
  - These documents shall include:
    - production and test documents associated with the instruments
    - shipping documents indicating instrument/product type, serial number
2. Test and calibration documents

A comprehensive Method Statement on the applied calibration and in-factory end-test procedures shall be part of the delivery. The Method Statement defines the test and calibration methods applied on the instruments and the components thereof. The Method Statement shall also include, for each calibrated product, an audit trail to national standards on all instruments and facilities used for end-testing and calibration. The Audit Trail Report shall associate the calibration of the reference instruments and test equipment to the national calibration standards.

Conditions during calibration, such as room and/or instrument temperature, equipment and facilities used, shall be included in the calibration and end-test documents.

The end-test and calibration documents shall summarise the data generated during calibration and testing, including:

- calibration and end-test data on all measuring instruments
- test data on performance over the specified temperature range
- humidity/moisture test
- spray test on enclosure(s), connectors and cables

All documents shall have identification and references to subject or instrument, date, time, location and officer in charge.

## **2. Manuals and guidelines**

For each item the availability and adequacy of the manuals and guidelines shall be verified.

The manuals shall meet the requirements on style and clarity, completeness, preciseness, detail and accessibility. This includes:

- system manual
- operation, maintenance and service manuals
- user's guideline, and
- training handouts

## **3. Training**

The effectiveness of the training shall be verified through discussion with the trainees and performance monitoring while preparing and executing a bathymetric survey.

**DETAILS OF MANUFACTURERS OF EQUIPMENT  
RELATED TO  
BATHYMETRIC SYSTEMS**

**Particulars of offered items and Addresses of manufacturers.**

|         |   |  |
|---------|---|--|
| Model   | <b>Echosounder</b><br>Model/type  |  |
| Address | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|         | <b>Sound velocity calibrator</b><br>Model/type                            |  |
|         | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|         | <b>DGPS</b><br>Model/type   |  |
|         | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|         | <b>Digital radio link</b><br>model/type                                   |  |
|         | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|         | <b>Data collection PC</b><br>model/type                                   |  |
|         | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |

|  |   |  |
|--|---|--|
|  | <b>Bathymetry software</b><br>model/type                                  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Survey boat</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Boat trailer</b><br>model/type   |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Outboard engine</b><br>model/type                                      |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Voice radio</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |

|  |   |  |
|--|---|--|
|  | <b>Battery charger</b><br>model/type                                      |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Portable generator</b><br>model/type                                   |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>UPS</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Office computer</b><br>model/type                                      |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>CD-recorder</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Plotter</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:                              |  |

|  |   |  |
|--|---|--|
|  | Fax:<br>E-mail:<br>WWWeb:   |  |
|  | <b>Printer</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |



## Section VII B

### Technical Responsiveness Criteria

**Note on Preparation of the Checklist for Purchasers:** The following is a sample format that is designed to help Bidders quickly understand:

- (a) The Technical Specification given the Technical Requirements:
- (b) Whether each Requirement is “mandatory” or only “preferred”, and

**Note to Bidders:** The following Checklist is provided to help the Bidder organize and consistently present its Technical Bid. For each of the following Technical requirements, the Bidder **MUST** describe how its Technical Bid responds to each requirement. The Technical Responsiveness Checklist does not supersede the rest of the Technical Requirements (or any other part of the Bidding Documents). If a requirement is not mentioned in the Checklist, that does not relieve the Bidder from the responsibility of including supporting evidence of compliance with that other requirement in its Technical Bid. One or two word responses (e.g., “Yes”, “No”, “will comply”, etc.) are normally not sufficient to confirm technical responsiveness with Technical Requirements.

The Integrated Bathymetric System comprises the following four components:

#### **Integrated Bathymetric System**

1. Hydrographic echosounder
2. Sound velocity calibrator
3. Differential global positioning system
4. Data collection computer
5. Bathymetric software for data acquisition and processing

#### **Survey boat and accessories**

6. Survey boat
7. Boat trailer
8. Outboard engine
9. Voice radio

#### **Auxiliary equipment**

10. Battery charger
11. Portable generator
12. UPS
13. Office computer
14. CD-recorder
15. Plotter
16. Printer

#### **Training Programme**

17. Training of personnel on pilot study in each state.

Next to a Technical Assessment, the evaluation will focus on the following matters:

- Expected lifetime, sturdiness, skilled design
- Tolerance for poor power supply, mishandling, spray water
- Update policy of software/firmware
- Ease of use
- Previous experience
- Facilities of workshop of local vendor/representative
- Service response times: telecomm (tel,fax,email) and field service, repair
- Training proposal, manuals and other documentation
- AMC cost, spares
- Size of company, other commercial fields

### **Technical evaluation**

The following critical items will be evaluated using a score system.

1. Echosounder
2. Differential global positioning system
3. Digital radio unit
4. Data collection computer
5. Surveying software for data acquisition and processing

For these items the ‘mandatory’ and ‘preferred’ requirements are indicated. Even if any one of the ‘mandatory’ requirements of these critical equipment are not fulfilled, the bids would be declared ‘non-responsive’ and would not be further evaluated. After response to the ‘mandatory’ requirements is fulfilled satisfactorily, the ‘preferred’ requirements would be evaluated based on the specification of the equipment.

For each equipment, the given score is entered in a Technical evaluation formula which is indicated below:

$$T = a \times ES + b \times PS + c \times RL + d \times PC + e \times SS$$

The item weights, i.e. the small letters in the formula, are denominated in the Technical Evaluation Table below. In the checklist for technical responsiveness of the critical equipment, weight factors are presented for each individual specification item.

## Evaluation Table

| Item                     | Item code | Weight Code | Item weight | Maximum score in % | Obtained score in % |
|--------------------------|-----------|-------------|-------------|--------------------|---------------------|
| echosounder              | ES        | a           | 0.20        | 20                 |                     |
| DGPS                     | PS        | b           | 0.20        | 20                 |                     |
| digital radio link       | RL        | c           | 0.10        | 10                 |                     |
| data collection computer | PC        | d           | 0.10        | 10                 |                     |
| bathymetric software     | BS        | e           | 0.40        | 40                 |                     |
| Total                    |           |             | 1.00        | 100                |                     |

**“Example for evaluation”:** If for anyone equipment say Echosounder, the total points for a particular vendor is 420 then the obtained score for this Echosounder is worked as:

$$\frac{\text{Toal Points Obtained}}{\text{Maximum Points}} \times 100 \times \text{Item Weight}$$

$$\text{i.e., } \frac{420}{600} \times 100 \times 0.20 = 14$$

A bid is considered ‘Technically Responsive’ if:

- (a) all individual specification items obtain more than 50% of the respective maximum points, and
- (b) the total technical points are more than 70 points.

For the Items under Survey Boat and Auxiliary Items, a bid is regarded as technically responsive, if all the offered items comply with the technical specifications in compliance with the Specification Requirement Form (Page 40) and the qualification criteria.

## Checklist for Technical Responsiveness

Abbreviations in the column headers:

R A \* character in the R column indicates that the associated specification is mandatory and should be fully complied with.

W The W column gives the weights for the individual items.

P The P column gives the results for each item. If a specification is not complied with, then the no points will be given to that item.

| 1.0  | <b>Echosounder</b>           | as specified   | as per bid | R | W  | P |
|------|------------------------------|--|------------|---|----|---|
|      | <b>acoustic transducer 1</b> |  |            |   |    |   |
| 1.1  | acoustic frequency           | approximately 200 kHz  |            | * |    |   |
| 1.2  | sound beam width             | ≤10 degrees  |            | * |    |   |
|      | <b>acoustic transducer 2</b> |  |            |   |    |   |
| 1.3  | acoustic frequency           | one frequency in the range between 15 to 45 kHz  |            | * |    |   |
| 1.4  | sound beam width             | ≤30 degrees  |            | * |    |   |
|      | <b>transducers 1 and 2</b>   |  |            |   |    |   |
| 1.5  | depth ranges                 | selectable up to 250 m (0 to 10, 25, 50, 100, 250 m or equivalent)                         |            | * |    |   |
| 1.6  | minimum depth                | approx. 0.3 m below transducer   |            |   | 50 |   |
| 1.7  | output power                 | approx. 250 W  |            |   | 50 |   |
| 1.8  | transducer cable length      | ≥8 m   |            |   | 10 |   |
| 1.9  | alarm                        | low depth indication   |            |   | 50 |   |
| 1.10 | speed of sound adjustment    | 1400 to 1550 m/s in steps of 1 m/s   |            |   | 10 |   |
| 1.11 | measuring rate               | ≥5 readings/second   |            |   | 30 |   |
| 1.12 | digitised accuracy           | 0.25% of indicated depth   |            | * |    |   |
| 1.13 | digitised resolution         | 0.01 m or better   |            | * |    |   |
| 1.14 | gating                       | bottom tracking, and adjustable gate width   |            |   | 50 |   |
| 1.15 | display                      | LCD with good daylight readability   |            |   | 50 |   |
| 1.16 | interface                    | USB or one of RS232, RS422, RS485 for output of depth information and input of annotation. |            | * |    |   |
| 1.17 | data format                  | NMEA-0183  |            | * |    |   |
| 1.18 | update interval              | ≤1 second  |            |   | 30 |   |
|      |                              |  |            |   |    |   |
|      | <b>paper recorder</b>        |  |            |   |    |   |
| 1.19 | recording method             | electrical (classic), thermal or jet paper   |            |   | 10 |   |
| 1.20 | resolution                   | 1 dot/cm water depth or better   |            |   | 10 |   |
| 1.21 | depth scale                  | metric graduation pre-printed or printed automatically                                     |            |   | 50 |   |
| 1.22 | recording width              | ≥20 cm   |            |   | 50 |   |
| 1.23 | paper length                 | ≥15 m  |            |   | 10 |   |
| 1.24 | time scale                   | regular graduation pre-printed or printed automatically                                    |            |   | 50 |   |

|      |                       |  |                 |   |            |  |
|------|-----------------------|--|-----------------|---|------------|--|
| 1.25 | recording speed       | adjustable: off, 5 to 60 mm/minute                                     |                 |   | 30         |  |
| 1.26 | fix marker            | under software control from PC, switch and contact                     |                 |   | 50         |  |
| 1.27 | annotation            | free text from PC, and annotation of scales and ranges.                |                 |   | 10         |  |
| 1.28 | power supply          | 11 to 18 VDC or wider  |                 | * |            |  |
| 1.29 | ingress protection    | the enclosure, connectors and cables should be sturdy and splash proof |                 | * |            |  |
| 1.30 | operating temperature | 0 to 50°C  |                 | * |            |  |
| 1.31 | humidity              | 10 to 95%  |                 | * |            |  |
|      |                       |  | <b>Total ES</b> |   | <b>600</b> |  |

|      |   |  |              |   |            |   |
|------|---|--|--------------|---|------------|---|
| 2.0  | <b>Sound Velocity Calibrator sensor</b> | as specified                               | as per bid   | R | W          | P |
| 2.1  | accuracy                                | ≤1 m/s                                     |              |   | 50         |   |
| 2.2  | velocity range                          | fresh/saltwater; 0 to 40°C                 |              |   | 50         |   |
| 2.3  | sampling time                           | <5 seconds                                 |              |   | 10         |   |
| 2.4  | minimum depth                           | ≤1 m                                       |              |   | 10         |   |
| 2.5  | maximum depth                           | ≥100 m                                     |              |   | 10         |   |
| 2.6  | cable length                            | ≥25 m                                      |              |   | 10         |   |
|      | <b>control unit</b>                     |  |              |   |            |   |
| 2.7  | power supply                            | standard dry cell(s), e.g. AA, C or D size |              |   | 50         |   |
| 2.8  | battery autonomy                        | ≥10.000 readings                           |              |   | 50         |   |
| 2.9  | display                                 | good readability in daylight               |              |   | 50         |   |
| 2.10 | displayed units                         | m/s  |              |   | 50         |   |
| 2.11 | resolution                              | ≤0.1 m/s                                   |              |   | 50         |   |
| 2.12 | operating temperature                   | 0 to 50°C                                  |              |   | 50         |   |
| 2.13 | humidity                                | 10 to 95%                                  |              |   | 50         |   |
| 2.14 | enclosure                               | sturdy, portable, splash proof             |              |   | 50         |   |
|      |   |  | <b>total</b> |   | <b>540</b> |   |

|     |                               |  |            |   |    |   |
|-----|-------------------------------|--|------------|---|----|---|
| 3.0 | <b>DGPS reference station</b> | as specified   | as per bid | R | W  | P |
| 3.1 | GPS receiver channels         | ≥8 parallel  |            | * |    |   |
| 3.2 | tracking characteristics      | L1 C/A code and carrier                              |            | * |    |   |
| 3.3 | antenna                       | external compact dome                                |            |   | 10 |   |
| 3.4 | antenna cable                 | ≥12 m, low loss type for the GPS frequencies         |            |   | 30 |   |
| 3.5 | display                       | built in display for set-up, control and supervision |            | * |    |   |
| 3.6 | keypad                        | for set-up and control                               |            | * |    |   |
|     | <b>mobile station</b>         |  |            |   |    |   |
| 3.7 | GPS receiver channels         | ≥8 parallel  |            | * |    |   |
| 3.8 | tracking characteristics      | L1 C/A code and carrier                              |            | * |    |   |

|      |               |  |                 |   |           |  |
|------|---------------|--|-----------------|---|-----------|--|
| 3.9  | antenna       | external compact dome                                |                 |   | 10        |  |
| 3.10 | antenna cable | ≥12 m, low loss type for the GPS frequencies         |                 |   | 30        |  |
| 3.11 | display       | built in display for set-up, control and supervision |                 | * |           |  |
| 3.12 | keypad        | for set-up and control                               |                 | * |           |  |
|      |               |  | <b>Total PS</b> |   | <b>80</b> |  |

|      |                           |  |                 |   |            |   |
|------|---------------------------|--|-----------------|---|------------|---|
|      | <b>digital radio link</b> | as specified   | as per bid      | R | W          | P |
| 3.13 | radio frequency           | VHF (or UHF) band                                    |                 |   | 50         |   |
| 3.14 | reference station antenna | directional Yagi                                     |                 |   | 50         |   |
| 3.15 | mobile station antenna    | omni-directional, co-linear                          |                 |   | 10         |   |
| 3.16 | antenna cable             | ≥12 m, low loss type for the radio modem frequencies |                 |   | 10         |   |
| 3.17 | corrections input         | RTCM SC104 V2 or later                               |                 | * |            |   |
| 3.18 | update rate               | ≥1/s   |                 |   | 50         |   |
|      | <b>general</b>            |  |                 |   |            |   |
| 3.19 | DGPS accuracy             | <1 m (95% confidence level)                          |                 | * |            |   |
| 3.20 | position update rate      | ≥1/s   |                 | * |            |   |
| 3.21 | data output               | ASCII, serial RS232, ≥9600 baud                      |                 |   | 50         |   |
| 3.22 | data storage (optional)   | 2 PCMCIA cards of ≥4 Mb                              |                 |   | 10         |   |
| 3.23 | power supply              | 11 to 18 VDC or wider                                |                 | * |            |   |
| 3.24 | enclosure, connections    | compliant with IP65                                  |                 | * |            |   |
| 3.25 | operating temperature     | 0 to 60°C  |                 | * |            |   |
| 3.26 | operating humidity        | 0 to 100%  |                 | * |            |   |
|      |                           |  | <b>Total RL</b> |   | <b>260</b> |   |

|      |                    |   |            |   |    |   |
|------|--------------------|---|------------|---|----|---|
| 4.0  | <b>Laptop PC</b>   | as specified                            | as per bid | R | W  | P |
| 4.1  | CPU type           | Pentium III, ≥450 MHz                   |            | * |    |   |
| 4.2  | Internal memory    | ≥64 Mbytes SDRAM                        |            | * |    |   |
| 4.3  | Cache memory       | ≥512 Kbytes L2                          |            | * |    |   |
| 4.4  | Hard disk          | ≥3 Gbytes UATA HDU                      |            | * |    |   |
| 4.5  | PC card slots      | 2 Type II or 1 Type III slot            |            |   | 30 |   |
| 4.6  | FDD                | 1.44 MB FDD                             |            |   | 10 |   |
| 4.7  | parallel port      | EPP / ECP, bi-directional               |            |   | 10 |   |
| 4.8  | serial ports       | ≥2 fast serial ports                    |            |   | 50 |   |
|      |                    | PS/2 port                               |            |   | 50 |   |
|      |                    | USB                                     |            |   | 50 |   |
|      |                    | IrDA 1.1 compatible or more recent      |            |   | 10 |   |
| 4.9  | video port         | output for external CRT display         |            | * |    |   |
| 4.10 | video memory       | ≥2 Mbytes                               |            |   | 30 |   |
| 4.11 | pointing device    | touch pad and mouse                     |            |   | 30 |   |
| 4.12 | keyboard           | standard laptop layout                  |            |   | 30 |   |
| 4.13 | display technology | TFT                                     |            | * |    |   |
| 4.14 | brightness         | good readability in daylight conditions |            |   | 50 |   |

|      |                           |  |                 |   |            |  |
|------|---------------------------|--|-----------------|---|------------|--|
| 4.15 | resolution                | 800 x 600 or better                        |                 |   | 50         |  |
| 4.16 | battery type              | Lithium-ion, rechargeable                  |                 | * |            |  |
| 4.17 | battery autonomy          | ≥2 hours                                   |                 | * |            |  |
| 4.18 | power management          | APM support                                |                 |   | 10         |  |
| 4.19 | mass                      | <4 kg including power adapter              |                 |   | 10         |  |
| 4.20 | power supply              | 220 VAC ±25%; 47 to 53 Hz                  |                 |   | 50         |  |
| 4.21 | car battery adapter       | 11 to 18 VDC or wider                      |                 |   | 30         |  |
| 4.22 | operating temperature     | 10 to 50°C                                 |                 |   | 50         |  |
| 4.23 | humidity                  | 10 to 90% RH                               |                 |   | 50         |  |
| 4.24 | operating system          | MS-Windows98 on CD-ROM with manuals        |                 | * |            |  |
| 4.25 | additional software       | MS-Office97/2000 professional with manuals |                 | * |            |  |
| 4.26 | virus protection software | McAfee, Norton or Dr. Solomon              |                 |   | 50         |  |
|      |                           |  | <b>Total PC</b> |   | <b>650</b> |  |

### Software specifications

| 5.0  | <b>Bathymetric Software</b>   | R | W  | P |
|------|---|---|----|---|
|      | <b>Data Collection Software Functions</b>   |   |    |   |
| 5.1  | run-line preparation  | * |    |   |
| 5.2  | on line datum conversion  |   | 30 |   |
| 5.3  | collecting, processing and storing of data from the DGPS positioning system and the echosounder   | * |    |   |
| 5.4  | data storage by increments of sailed distance (fix by distance)   |   | 50 |   |
| 5.5  | monitoring of data acquisition related quality indicators; in particular the performance of the DGPS (HDOP, functioning of the differential mode etc.), the echosounder and the track keeping of the helmsman |   | 50 |   |
| 5.6  | accurate time stamping of collected data, i.e. better than 0.05 s   | * |    |   |
| 5.7  | generation of annotation text for the echosounder   | * |    |   |
| 5.8  | helmsman guidance by left right indication and track searching and depth information on a helmsman display  | * |    |   |
| 5.9  | presentation of process information and providing controls to the operator  | * |    |   |
| 5.10 | generation of alerts to the operator in case of echosounder and/or DGPS problems  | * |    |   |
|      |   |   |    |   |
|      | <b>Data Processing Software Functions</b>   |   |    |   |
| 5.11 | combination of survey data from different files, sessions and formats   | * |    |   |
| 5.12 | addition of shorelines and landmarks to the data sets and inclusion of the same in the produced maps/charts   |   | 30 |   |
| 5.13 | digitising of paper based topological data (maps, charts)   | * |    |   |
| 5.14 | free zooming and panning of maps, charts and plots  |   | 30 |   |
| 5.15 | drafting of 'sailed track' (depth) plots  | * |    |   |
| 5.16 | generation of depth number charts   | * |    |   |
| 5.17 | spike/outlier/error detection and editing supported by graphics   | * |    |   |
| 5.18 | generation of TIN model and interpolation to rectangular grid   | * |    |   |
| 5.19 | generation of depth contours plots  | * |    |   |
| 5.20 | assessment of reservoir capacity versus depth   | * |    |   |
| 5.21 | assessment of erosion and sedimentation changes (comparison of with previous/other data sets). The changes shall be presented as an overlay   | * |    |   |

|      |  |   |            |  |
|------|--|---|------------|--|
|      | on the depth contour map and on a 'changes map'. Areas of sedimentation, erosion and of no change should be clearly indicated. |   |            |  |
| 5.22 | assessment of net sedimentation/erosion versus depth   | * |            |  |
|      | <b>Total BS</b>  |   | <b>190</b> |  |



## Auxiliary specifications

| 6.0  | <b>FRP Boat</b>       | as specified  | as per bid | R | W | P |
|------|-----------------------|---|------------|---|---|---|
| 6.1  | material              | FRP or aluminium  |            |   |   |   |
| 6.2  | length                | ≥7.5 m  |            |   |   |   |
| 6.3  | width                 | approx. 2.5 m   |            |   |   |   |
| 6.4  | draft                 | approx. 0.5 m   |            |   |   |   |
| 6.5  | free board            | approx. 0.6 m   |            |   |   |   |
| 6.6  | bottom shape          | flat or slightly catamaran  |            |   |   |   |
| 6.7  | propulsion            | 2 Nos. of ≥30 kW (≥40 HP) outboard engines. Cruising speed shall be 20 knots or more with full load.  |            |   |   |   |
| 6.8  | carrying capacity     | ≥1000 kg  |            |   |   |   |
|      |                       |   |            |   |   |   |
|      | <b>Cabin</b>          |   |            |   |   |   |
| 6.9  | length                | approx. 3 m   |            |   |   |   |
| 6.10 | height                | ample sitting height  |            |   |   |   |
| 6.11 | door                  | lockable  |            |   |   |   |
| 6.12 | door width            | >0.8 m  |            |   |   |   |
|      |                       |   |            |   |   |   |
|      | <b>Boat outfit</b>    |   |            |   |   |   |
| 6.13 | anchor                | matching the boat, fitted with sufficient rope to safely anchor in the deepest reservoir of the State |            |   |   |   |
| 6.14 | echosounder           | indicator type for navigation purposes, fitted in the boat  |            |   |   |   |
| 6.15 | compass               | magnetic type for navigation purposes, fitted in the boat   |            |   |   |   |
| 6.16 | fenders               | ≥4 of Coir type   |            |   |   |   |
| 6.17 | paddles               | ≥4 for rowing   |            |   |   |   |
| 6.18 | life jacket           | ≥8 pieces, for each person on board, also for guests  |            |   |   |   |
| 6.19 | life buoy             | ≥2 pieces, one on SB and one on BB, with at least 50 m line, readily available on board               |            |   |   |   |
| 6.20 | fire extinguisher     | >2 pieces, net weight ≥5 kg   |            |   |   |   |
|      |                       |   |            |   |   |   |
| 7.0  | <b>Trailer</b>        | as specified  | as per bid | R | W | P |
| 7.1  | material              | galvanised iron   |            |   |   |   |
| 7.2  | capacity              | sufficient to carry the boat with engines, petrol, tools etc.   |            |   |   |   |
| 7.3  | dimensions            | matching the size of the boat   |            |   |   |   |
|      |                       |   |            |   |   |   |
|      | <b>trailer outfit</b> |   |            |   |   |   |
| 7.4  | winch                 | with ratchet and pawl for pulling the boat onto the trailer   |            |   |   |   |

|      |                              |  |            |   |   |   |
|------|------------------------------|--|------------|---|---|---|
| 7.5  | guidance rollers             | rubber, fitting to the shape of the boat   |            |   |   |   |
| 7.6  | lights                       | removable assembly of taillights viz. red tail lights, read break-lights and orange left and right direction indicators. |            |   |   |   |
| 7.7  | spare tyre                   | spare wheel with tyre  |            |   |   |   |
| 8.0  | <b>Outboard engines</b>      |  |            |   |   |   |
| 8.1  | capacity                     | ≥30 kW (≥40 HP)  |            |   |   |   |
| 8.2  | operation                    | remote controlled twin engine, electric start  |            |   |   |   |
| 8.3  | fuel                         | petrol start, kerosene running   |            |   |   |   |
| 8.4  | propeller                    | workhorse type, to be selected during trials with boat   |            |   |   |   |
| 8.5  | tail length                  | to match with boat   |            |   |   |   |
| 8.6  | alarms                       | over heating, oil pressure   |            |   |   |   |
| 9.0  | <b>Voice radio</b>           | as specified   | as per bid | R | W | P |
|      | <b>general</b>               |  |            |   |   |   |
| 9.1  | frequency range              | VHF  |            |   |   |   |
| 9.2  | number of channels           | ≥10 (all pre-set)  |            |   |   |   |
| 9.3  | channel spacing              | ≤25 kHz  |            |   |   |   |
| 9.4  | type of operation            | Simplex  |            |   |   |   |
| 9.5  | antenna                      | omni-directional (whip)  |            |   |   |   |
|      | <b>transmitter</b>           |  |            |   |   |   |
| 9.6  | frequency stability          | ±5 ppm   |            |   |   |   |
| 9.7  | RF power output              | full coverage of the largest reservoir, e.g. ≥5 W  |            |   |   |   |
| 9.8  | suppression                  | 50 dB minimum (spurious and harmonic)  |            |   |   |   |
| 9.9  | adjacent channel power       | ≤-55dBc  |            |   |   |   |
| 9.10 | intermodulation distortion   | less than 25 dB corresponding PEP  |            |   |   |   |
| 9.11 | microphone impedance         | 300 Ω (Unbalanced)   |            |   |   |   |
|      | <b>receiver</b>              |  |            |   |   |   |
| 9.12 | frequency stability          | ±10 ppm  |            |   |   |   |
| 9.13 | sensitivity                  | ≤0.3 uV for 12 dB SINAD  |            |   |   |   |
| 9.14 | adjacent channel selectivity | 60 dB  |            |   |   |   |
| 9.15 | intermodulation              | 60 dB  |            |   |   |   |
| 9.16 | IF rejection                 | 60 dB minimum  |            |   |   |   |
| 9.17 | image rejection              | 60 dB minimum  |            |   |   |   |

|       |                           |   |            |   |   |   |
|-------|---------------------------|---|------------|---|---|---|
| 9.18  | AF output                 | 0.5 W into 150 $\Omega$   |            |   |   |   |
| 9.19  | power supply              | 11 to 18 VDC or wider   |            |   |   |   |
| 9.20  | enclosure, connections    | complying with IP 54 or better                                    |            |   |   |   |
| 9.21  | operating temperature     | 0 to 50°C   |            |   |   |   |
| 9.22  | operating humidity        | 10 to 95%   |            |   |   |   |
|       |                           |   |            |   |   |   |
| 10.0  | <b>Battery charger</b>    | as specified  | as per bid | R | W | P |
| 10.1  | supported battery type    | lead acid, 12 V nominal, maximum capacity 125 Ah                  |            |   |   |   |
| 10.2  | charging capacity         | $\geq 12A$ , adjustable to battery type and capacity              |            |   |   |   |
| 10.3  | over charge protection    | on battery charge and voltage                                     |            |   |   |   |
| 10.4  | trickle charging current  | approx. 1 A, adjustable to battery type and capacity              |            |   |   |   |
| 10.5  | overload current trip     | approx. 15 A  |            |   |   |   |
| 10.6  | dry mass                  | $\leq 10$ kg  |            |   |   |   |
| 10.7  | power supply              | 220 VAC $\pm 5\%$ , 47 to 53 Hz, single phase                     |            |   |   |   |
| 10.8  | enclosure, connections    | complying with IP 54 or better                                    |            |   |   |   |
| 10.9  | operating temperature     | 0 to 50°C   |            |   |   |   |
| 10.10 | operating humidity        | 10 to 95%   |            |   |   |   |
|       |                           |   |            |   |   |   |
| 11.0  | <b>Portable generator</b> | as specified  | as per bid | R | W | P |
| 11.1  | engine                    | air-cooled petrol engine  |            |   |   |   |
| 11.2  | output                    | 220 VAC $\pm 5\%$ , 47 to 53 Hz, single phase                     |            |   |   |   |
| 11.3  | capacity                  | as required by the load with at least 25% overload surge capacity |            |   |   |   |
| 11.4  | size                      | sum of length, width and height less than 200 cm                  |            |   |   |   |
| 11.5  | dry mass                  | $\leq 50$ kg  |            |   |   |   |
| 11.6  | fuel consumption          | $\leq 0.4$ kg/(kWh)   |            |   |   |   |
| 11.7  | fuel tank capacity        | for at least 2 hours of continuous full load operation            |            |   |   |   |
| 11.8  | starting method           | manual starting   |            |   |   |   |
| 11.9  | exhaust                   | silencer with muffler   |            |   |   |   |
| 11.10 | environment               | ingress protection complying with IP 54 or better                 |            |   |   |   |
|       |                           |   |            |   |   |   |

|       |                           |  |            |   |   |   |
|-------|---------------------------|--|------------|---|---|---|
| 12.0  | <b>UPS</b>                | as specified   | as per bid | R | W | P |
|       | <b>general</b>            |  |            |   |   |   |
| 12.1  | type                      | on line  |            |   |   |   |
| 12.2  | capacity                  | ≥1 kVA   |            |   |   |   |
| 12.3  | protection                | input line fuse  |            |   |   |   |
|       |                           | overload   |            |   |   |   |
|       |                           | short circuit  |            |   |   |   |
| 12.4  | <b>indicators</b>         | power on   |            |   |   |   |
|       |                           | load bar graph   |            |   |   |   |
|       |                           | charge/discharge   |            |   |   |   |
|       |                           | mains failure acoustic alarm                                 |            |   |   |   |
| 12.5  | MTBF                      | ≥10000 hours (Mean Time Before Failure)                      |            |   |   |   |
|       |                           |  |            |   |   |   |
|       | <b>performance</b>        |  |            |   |   |   |
| 12.6  | cut-off input voltage     | 160 to 280 VAC, 47 to 53 Hz                                  |            |   |   |   |
| 12.7  | switch over to batteries  | <175 VAC and >265 VAC  |            |   |   |   |
| 12.8  | output                    | 220 VAC ±5%, 47 to 53 Hz                                     |            |   |   |   |
| 12.9  | backup time               | ≥60 minutes  |            |   |   |   |
| 12.10 | inverter efficiency       | > 85%  |            |   |   |   |
| 12.11 | overload                  | 110% continuous  |            |   |   |   |
|       |                           | 120% ≥30 minutes   |            |   |   |   |
|       |                           | 150% ≥1 minute   |            |   |   |   |
|       |                           | 200% ≥1 second   |            |   |   |   |
| 12.12 | <b>internal batteries</b> |  |            |   |   |   |
| 12.13 | DC voltage                | ≥48 V  |            |   |   |   |
| 12.14 | charge modes              | trickle and boost charge                                     |            |   |   |   |
| 12.15 | protection                | reverse polarity connection                                  |            |   |   |   |
|       |                           | over-charge  |            |   |   |   |
|       |                           | too deep depletion   |            |   |   |   |
| 13.0  | <b>Office computer</b>    | as specified   | as per bid | R | W | P |
|       | <b>PC</b>                 |  |            |   |   |   |
| 13.1  | CPU type                  | Pentium II, ≥450 MHz   |            |   |   |   |
| 13.2  |                           | 440BX AGPset   |            |   |   |   |
| 13.3  | internal memory           | ≥64 Mbytes 100 MHz SDRAM (PC-100), expandable to ≥256 Mbytes |            |   |   |   |
| 13.4  | cache memory              | ≥512 kbytes L2 cache   |            |   |   |   |
| 13.5  | hard disk                 | ≥6.0 Gbytes Ultra ATA HDU                                    |            |   |   |   |
| 13.6  | CD ROM                    | ≥32X speed, either internal or external                      |            |   |   |   |
| 13.7  | free slots                | ≥2 PCI, ≥1 ISA, ≥1 AGP                                       |            |   |   |   |
| 13.8  | FDD                       | 1 - 1.44 MB FDD  |            |   |   |   |

|       |                             |  |            |   |   |   |
|-------|-----------------------------|--|------------|---|---|---|
| 13.9  | parallel port               | 1 - EPP / ECP, bi-directional                          |            |   |   |   |
| 13.10 | serial port                 | ≥1 - fast serial port                                  |            |   |   |   |
|       |                             | ≥1 - USB port  |            |   |   |   |
| 13.11 | mouse port                  | 1 - bus mouse port                                     |            |   |   |   |
| 13.12 | video controller            | AGP with 8 Mbytes memory<br>(expandable to 16 Mbytes)  |            |   |   |   |
|       |                             |  |            |   |   |   |
|       | <b>colour monitor</b>       |  |            |   |   |   |
| 13.13 | size                        | ≥17"   |            |   |   |   |
| 13.14 | pixels                      | ≥1024 x 768  |            |   |   |   |
| 13.15 | video standard              | XGA/VESA 1024 or better                                |            |   |   |   |
| 13.16 | power supply                | 220 VAC ±25%; 47 to 53 Hz                              |            |   |   |   |
| 13.17 | operating temperature       | 10 to 45°C   |            |   |   |   |
| 13.18 | humidity                    | 10 to 80%  |            |   |   |   |
|       |                             |  |            |   |   |   |
| 14.0  | <b>CD-recorder</b>          | as specified   | as per bid | R | W | P |
| 14.1  | speed                       | ≥2X  |            |   |   |   |
| 14.2  | media                       | CD-R and CD-RW   |            |   |   |   |
| 14.3  | interface                   | EPP / ECP, bi-directional                              |            |   |   |   |
| 14.4  | housing                     | external, portable                                     |            |   |   |   |
| 14.5  | power supply<br>(in office) | 220 VAC ±25%;<br>47 to 53 Hz                           |            |   |   |   |
| 14.6  | (on board)                  | 11 to 18 VDC or wider                                  |            |   |   |   |
| 14.7  | operating temperature       | 10 to 45°C   |            |   |   |   |
| 14.8  | humidity                    | 10 to 80%  |            |   |   |   |
|       |                             |  |            |   |   |   |
| 15.0  | <b>Plotter/printer</b>      | as specified   | as per bid | R | W | P |
|       | <b>general</b>              |  |            |   |   |   |
| 15.1  | paper sizes                 | A4 to A3   |            |   |   |   |
| 15.2  | absolute accuracy           | ≤0.25 mm of any point                                  |            |   |   |   |
| 15.3  | resolution                  | ≥300 dpi colour  |            |   |   |   |
| 15.4  |                             | ≥600 dpi monochrome                                    |            |   |   |   |
| 15.5  | plotting method             | raster (pen type is not<br>effective for colour fills) |            |   |   |   |
|       |                             |  |            |   |   |   |
|       | <b>data formats</b>         |  |            |   |   |   |
| 15.6  | vector                      | HPGL (1 and 2), BGL, VDF                               |            |   |   |   |
| 15.7  | raster                      | HPRTL, TIFF 5.0  |            |   |   |   |
| 15.8  | other                       | Postscript   |            |   |   |   |
|       |                             |  |            |   |   |   |
|       | <b>auxiliary</b>            |  |            |   |   |   |
| 15.9  | interfaces                  | -LAN or<br>-EPP / ECP, bi-directional                  |            |   |   |   |
| 15.10 | serial                      | RS232; ≥9600 baud                                      |            |   |   |   |
| 15.11 | memory                      | ≥16 MB, expandable to 64<br>MB                         |            |   |   |   |
| 15.12 | power supply                | 220 VAC ±25%; 47 to 53 Hz                              |            |   |   |   |

|       |                       |   |            |   |   |   |
|-------|-----------------------|---|------------|---|---|---|
| 15.13 | operating temperature | 10 to 45°C  |            |   |   |   |
| 15.14 | humidity              | 10 to 80%   |            |   |   |   |
| 16.0  | <b>Printers</b>       | as specified  | as per bid | R | W | P |
|       | <b>laser printer</b>  |   |            |   |   |   |
| 16.1  | printing speed        | ≥12 ppm   |            |   |   |   |
| 16.2  | printing resolution   | ≥600 * 600 dpi  |            |   |   |   |
| 16.3  | buffer capacity       | ≥4 Mbytes, expendable to 8 Mbytes                     |            |   |   |   |
| 16.4  | printer language      | MS-Windows compatible, enhanced PCL 5                 |            |   |   |   |
| 16.5  | fonts                 | ≥20, and scaleable fonts                              |            |   |   |   |
| 16.6  | interfaces            | -LAN or<br>-EPP / ECP, bi-directional                 |            |   |   |   |
| 16.7  | serial                | RS232; ≥9600 baud                                     |            |   |   |   |
| 16.8  | interface             | -LAN<br>-EPP / ECP, bi-directional or<br>RS232; ≥baud |            |   |   |   |
| 16.9  | paper size            | A4, letter, executive                                 |            |   |   |   |
| 16.10 | paper tray capacity   | ≥100 sheets   |            |   |   |   |
| 16.11 | paper types           | plain paper, envelopes, and transparencies            |            |   |   |   |
| 16.12 | power supply          | 220 VAC ±25%; 47 to 53 Hz                             |            |   |   |   |
| 16.13 | operating temperature | 10 to 45°C  |            |   |   |   |
| 16.14 | humidity              | 10 to 80%   |            |   |   |   |
|       | <b>inkjet printer</b> |   |            |   |   |   |
| 16.15 | printing speed        | black ≥3 ppm (A4),<br>colour ≥1.5 ppm (A4)            |            |   |   |   |
| 16.16 | printing resolution   | B/W ≥600 * 600 dpi<br>colour ≥300 * 300 dpi           |            |   |   |   |
| 16.17 | printer language      | MS-Windows compatible                                 |            |   |   |   |
| 16.18 | fonts                 | ≥20 graphics, and scaleable                           |            |   |   |   |
| 16.19 | interface             | parallel  |            |   |   |   |
| 16.20 | paper size            | A4, A3, letter, executive                             |            |   |   |   |
| 16.21 | paper tray capacity   | 100 sheets plain paper                                |            |   |   |   |
| 16.22 | paper types           | plain paper, envelopes and transparencies             |            |   |   |   |
| 16.23 | power supply          | 220 VAC ±25%; 47 to 53 Hz                             |            |   |   |   |
| 16.24 | operating temperature | 10 to 45°C  |            |   |   |   |
| 16.25 | humidity              | 10 to 80%   |            |   |   |   |

|      |                                    |  |  |  |
|------|------------------------------------|--|--|--|
| 17.0 | <b>Training programme</b>          |  |  |  |
| 17.1 | theory                             |  |  |  |
| 17.2 | Practice with operating manuals    |  |  |  |
| 17.3 | pilot test                         |  |  |  |
| 17.4 | follow up with maintenance manuals |  |  |  |



## SECTION VII C

### Technical Responsiveness Criteria

The following is the format that is designed to help Bidders quickly understand the mandatory requirements of each one of the equipment of the Integrated Bathymetric System. The following Checklist is provided to help the Bidder to organize and consistently present its Technical Bid. For each of the mandatory Technical requirements, the Bidder **MUST** describe how his Technical Bid responds to each of these mandatory requirements. The Technical Responsiveness Checklist does not supersede the rest of the Technical Requirements (or any other part of the Bidding Documents). Mandatory requirements do not relieve the Bidder from the responsibility of including supporting evidence of compliance with that other requirement in its Technical Bid. One or two word responses (e.g., “Yes”, “No”, “will comply”, etc.) are normally not sufficient to confirm the responsiveness with mandatory technical requirements. **Even if any one of the ‘mandatory’ requirements of the equipment is not fulfilled, the bids would be declared ‘non-responsive’ and would not be further considered for evaluation purposes.**

Next to a mandatory Technical Assessment, the evaluation will focus on the following matters:

- Expected lifetime, sturdiness, skilled design
- Tolerance for poor power supply, mishandling, spray water
- Update policy of software/firmware
- Ease of use
- Previous experience
- Facilities of workshop of local vendor/representative
- Service response times: telecomm (tel,fax,email) and field service, repair
- Training proposal, manuals and other documentation
- AMC cost, spares
- Size of company, other commercial fields



## Checklist for Technical Responsiveness

| 1.0  | Echosounder                  | as specified in bid  | as offered by bidder | Y/N |
|------|------------------------------|--|----------------------|-----|
|      | <b>acoustic transducer 1</b> |  |                      |     |
| 1.1  | acoustic frequency           | approximately 200 kHz  |                      |     |
| 1.2  | sound beam width             | ≤10 degrees  |                      |     |
|      | <b>acoustic transducer 2</b> |  |                      |     |
| 1.3  | acoustic frequency           | one frequency in the range between 15 to 45 kHz  |                      |     |
| 1.4  | sound beam width             | ≤30 degrees  |                      |     |
|      | <b>transducers 1 and 2</b>   |  |                      |     |
| 1.5  | depth ranges                 | selectable up to 250 m (0 to 10, 25, 50, 100, 250 m or equivalent)                         |                      |     |
| 1.6  | interface                    | USB or one of RS232, RS422, RS485 for output of depth information and input of annotation. |                      |     |
| 1.7  | measuring rate               | ≥ readings/second  |                      |     |
| 1.8  | digitised accuracy           | 0.25% of indicated depth   |                      |     |
| 1.9  | digitised resolution         | 0.01m or better  |                      |     |
| 1.10 | data format                  | NMEA-0183  |                      |     |
|      |                              |  |                      |     |
|      | <b>paper recorder</b>        |  |                      |     |
| 1.11 | depth scale                  | metric graduation pre-printed or printed automatically                                     |                      |     |
| 1.12 | recording width              | ≥20 cm   |                      |     |
| 1.13 | paper length                 | ≥15 m  |                      |     |
| 1.14 | time scale                   | regular graduation pre-printed or printed automatically                                    |                      |     |
| 1.15 | recording speed              | adjustable: off, 5 to 60 mm/minute   |                      |     |
| 1.16 | power supply                 | 11 to 18 VDC or wider  |                      |     |
| 1.17 | ingress protection           | the enclosure, connectors and cables should be sturdy and splash proof                     |                      |     |
| 1.18 | operating temperature        | 0 to 50°C  |                      |     |
| 1.19 | humidity                     | 10 to 95%  |                      |     |

| 2.0 | Sound Velocity Calibrator | as specified in bid        | as offered by bidder | Y/N |
|-----|---------------------------|----------------------------|----------------------|-----|
|     | <b>sensor</b>             |                            |                      |     |
| 2.1 | accuracy                  | ≤1 m/s                     |                      |     |
| 2.2 | velocity range            | fresh/saltwater; 0 to 40°C |                      |     |
| 2.3 | sampling time             | <5 seconds                 |                      |     |
| 2.4 | minimum depth             | ≤1 m                       |                      |     |
| 2.5 | maximum depth             | ≥100 m                     |                      |     |
| 2.6 | cable length              | ≥25 m                      |                      |     |
|     |                           |                            |                      |     |

|      |                       |  |  |  |
|------|-----------------------|--|--|--|
|      | <b>control unit</b>   |  |  |  |
| 2.7  | power supply          | standard dry cell(s), e.g. AA, C or D size |  |  |
| 2.8  | displayed units       | m/s  |  |  |
| 2.9  | resolution            | ≤0.1 m/s                                   |  |  |
| 2.10 | operating temperature | 0 to 50°C                                  |  |  |
| 2.11 | humidity              | 10 to 95%                                  |  |  |
| 2.12 | enclosure             | sturdy, portable, splash proof             |  |  |

|     |                          |  |                             |            |
|-----|--------------------------|--|-----------------------------|------------|
| 3.0 | <b>DGPS</b>              | <b>as specified in bid</b>                           | <b>as offered by bidder</b> | <b>Y/N</b> |
|     | <b>reference station</b> |  |                             |            |
| 3.1 | GPS receiver channels    | ≥8 parallel  |                             |            |
| 3.2 | tracking characteristics | L1 C/A code and carrier                              |                             |            |
| 3.3 | display                  | built in display for set-up, control and supervision |                             |            |
| 3.4 | keypad                   | for set-up and control                               |                             |            |
|     | <b>mobile station</b>    |  |                             |            |
| 3.5 | GPS receiver channels    | ≥8 parallel  |                             |            |
| 3.6 | tracking characteristics | L1 C/A code and carrier                              |                             |            |
| 3.7 | antenna cable            | ≥12 m, low loss type for the GPS frequencies         |                             |            |
| 3.8 | display                  | built in display for set-up, control and supervision |                             |            |
| 3.9 | keypad                   | for set-up and control                               |                             |            |

|      |                           |  |                             |            |
|------|---------------------------|--|-----------------------------|------------|
|      | <b>digital radio link</b> | <b>as specified in bid</b>                           | <b>as offered by bidder</b> | <b>Y/N</b> |
| 3.10 | antenna cable             | ≥12 m, low loss type for the radio modem frequencies |                             |            |
| 3.11 | corrections input         | RTCM SC104 V2 or later                               |                             |            |
| 3.12 | update rate               | ≥1/s   |                             |            |
|      | <b>general</b>            |  |                             |            |
| 3.13 | DGPS accuracy             | <1 m (95% confidence level)                          |                             |            |
| 3.14 | position update rate      | ≥1/s   |                             |            |
| 3.15 | Data output               | ASC II, USB and/or serial RS232 @ ≥ 9600 baud        |                             |            |
| 3.16 | power supply              | 11 to 18 VDC or wider                                |                             |            |
| 3.17 | enclosure, connections    | compliant with IP65                                  |                             |            |
| 3.18 | operating temperature     | 0 to 60°C  |                             |            |
| 3.19 | operating humidity        | 0 to 100%  |                             |            |

|     |                  |                            |                             |            |
|-----|------------------|----------------------------|-----------------------------|------------|
| 4.0 | <b>Laptop PC</b> | <b>as specified in bid</b> | <b>as offered by bidder</b> | <b>Y/N</b> |
| 4.1 | CPU type         | Pentium III, ≥450 MHz      |                             |            |
| 4.2 | Internal memory  | ≥64 Mbytes SDRAM           |                             |            |
| 4.3 | Cache memory     | ≥512 Kbytes L2             |                             |            |

|      |                           |  |  |  |
|------|---------------------------|--|--|--|
| 4.4  | Hard disk                 | ≥3 Gbytes UATA HDU                         |  |  |
| 4.5  | PC card slots             | 2 Type II or 1 Type III slot               |  |  |
| 4.6  | FDD                       | 1.44 MB FDD                                |  |  |
| 4.7  | parallel port             | EPP / ECP, bi-directional                  |  |  |
| 4.8  | serial ports              | ≥2 fast serial ports                       |  |  |
|      |                           | PS/2 port                                  |  |  |
|      |                           | USB  |  |  |
|      |                           | IrDA 1.1 compatible or more recent         |  |  |
| 4.9  | video port                | output for external CRT display            |  |  |
| 4.10 | video memory              | ≥2 Mbytes                                  |  |  |
| 4.11 | keyboard                  | standard laptop layout                     |  |  |
| 4.12 | display technology        | TFT  |  |  |
| 4.13 | Brightness/contrast       | good readability in daylight conditions    |  |  |
| 4.14 | resolution                | 800 x 600 or better                        |  |  |
| 4.15 | battery type              | Lithium-ion, rechargeable                  |  |  |
| 4.16 | battery autonomy          | ≥2 hours                                   |  |  |
| 4.17 | car battery adapter       | 11 to 18 VDC or wider                      |  |  |
| 4.18 | humidity                  | 10 to 90% RH                               |  |  |
| 4.19 | operating system          | MS-Windows98 on CD-ROM with manuals        |  |  |
| 4.20 | additional software       | MS-Office97/2000 professional with manuals |  |  |
| 4.21 | virus protection software | McAfee, Norton or Dr. Solomon              |  |  |

### Software specifications

| 5.0  | <b>Bathymetric Software</b>   | Y/N |
|------|---|-----|
|      | <b>Data Collection Software Functions</b>   |     |
| 5.1  | run-line preparation  |     |
| 5.2  | collecting, processing and storing of data from the DGPS positioning system and the echosounder             |     |
| 5.3  | data storage by increments of sailed distance (fix by distance)   |     |
| 5.4  | accurate time stamping of collected data, i.e. better than 0.05 s   |     |
| 5.5  | generation of annotation text for the echosounder   |     |
| 5.6  | helmsman guidance by left right indication and track searching and depth information on a helmsman display  |     |
| 5.7  | presentation of process information and providing controls to the operator                                  |     |
| 5.8  | generation of alerts to the operator in case of echosounder and/or DGPS problems                            |     |
|      |   |     |
|      | <b>Data Processing Software Functions</b>   |     |
| 5.9  | combination of survey data from different files, sessions and formats                                       |     |
| 5.10 | addition of shorelines and landmarks to the data sets and inclusion of the same in the produced maps/charts |     |
| 5.11 | digitising of paper based topological data (maps, charts)   |     |
| 5.12 | drafting of 'sailed track' (depth) plots  |     |
| 5.13 | generation of depth number charts   |     |
| 5.14 | spike/outlier/error detection and editing supported by graphics   |     |

|      |  |  |
|------|--|--|
| 5.15 | generation of TIN model and interpolation to rectangular grid  |  |
| 5.16 | generation of depth contours plots   |  |
| 5.17 | assessment of reservoir capacity versus depth  |  |
| 5.18 | assessment of erosion and sedimentation changes (comparison of with previous/other data sets). The changes shall be presented as an overlay on the depth contour map and on a 'changes map'. Areas of sedimentation, erosion and of no change should be clearly indicated. |  |
| 5.19 | assessment of net sedimentation/erosion versus depth   |  |

### Auxiliary specifications

| 6.0  | FRP Boat           | as specified in bid   | as offered by bidder        | Y/N        |
|------|--------------------|---|-----------------------------|------------|
| 6.1  | material           | FRP or aluminium  |                             |            |
| 6.2  | length             | ≥7.5 m  |                             |            |
| 6.3  | width              | ≥ 2.5 m   |                             |            |
| 6.4  | free board         | ≥ 0.6 m   |                             |            |
| 6.5  | propulsion         | 2 Nos. of ≥30 kW (≥40 HP) outboard engines. Cruising speed shall be 20 knots or more with full load.  |                             |            |
| 6.6  | carrying capacity  | ≥1000 kg  |                             |            |
|      | <b>Cabin</b>       |   |                             |            |
| 6.7  | length             | ≥ 2.75 m  |                             |            |
| 6.8  | height             | ample sitting height  |                             |            |
|      | <b>Boat outfit</b> |   |                             |            |
| 6.9  | anchor             | matching the boat, fitted with sufficient rope to safely anchor in the deepest reservoir of the State |                             |            |
| 6.10 | echosounder        | indicator type for navigation purposes, fitted in the boat  |                             |            |
| 6.11 | compass            | magnetic type for navigation purposes, fitted in the boat   |                             |            |
| 6.12 | fenders            | ≥4 of Coir type   |                             |            |
| 6.13 | paddles            | ≥4 for rowing   |                             |            |
| 6.14 | life jacket        | ≥8 pieces, for each person on board, also for guests  |                             |            |
| 6.15 | life buoy          | ≥2 pieces, one on SB and one on BB, with at least 50 m line, readily available on board               |                             |            |
| 6.16 | fire extinguisher  | >2 pieces, net weight ≥5 kg   |                             |            |
| 7.0  | <b>Trailer</b>     | <b>as specified in bid</b>  | <b>as offered by bidder</b> | <b>Y/N</b> |
| 7.1  | dimensions         | matching the size of the boat   |                             |            |

|      | <b>trailer outfit</b>   | <b>as specified in bid</b>  | <b>as offered by bidder</b> | <b>Y/N</b> |
|------|-------------------------|---|-----------------------------|------------|
| 7.2  | winch                   | with ratchet and pawl for pulling the boat onto the trailer   |                             |            |
| 7.3  | guidance rollers        | rubber, fitting to the shape of the boat  |                             |            |
| 7.4  | lights                  | removable assembly of taillights viz. red tail lights, red break-lights and orange left and right direction indicators. |                             |            |
| 7.5  | spare tyre              | spare wheel with tyre   |                             |            |
|      |                         |   |                             |            |
| 8.0  | <b>Outboard engines</b> |   |                             |            |
| 8.1  | capacity                | ≥30 kW (≥40 HP)   |                             |            |
| 8.2  | operation               | remote controlled twin engine, electric start   |                             |            |
| 8.3  | fuel                    | petrol  |                             |            |
|      |                         |   |                             |            |
| 9.0  | <b>Voice radio</b>      | <b>as specified in bid</b>  | <b>as offered by bidder</b> | <b>Y/N</b> |
|      | <b>general</b>          |   |                             |            |
| 9.1  | frequency range         | VHF   |                             |            |
| 9.2  | number of channels      | ≥10 (all pre-set)   |                             |            |
| 9.3  | channel spacing         | ≤25 kHz   |                             |            |
|      |                         |   |                             |            |
|      | <b>transmitter</b>      |   |                             |            |
| 9.4  | frequency stability     | ±5 ppm  |                             |            |
| 9.5  | RF power output         | full coverage of the largest reservoir, e.g. ≥5 W   |                             |            |
| 9.6  | suppression             | 50 dB minimum (spurious and harmonic)   |                             |            |
| 9.7  | adjacent channel power  | ≤-55dBc   |                             |            |
| 9.8  | microphone impedance    | 300 Ω (Unbalanced)  |                             |            |
|      |                         |   |                             |            |
|      | <b>receiver</b>         |   |                             |            |
| 9.9  | frequency stability     | ±10 ppm   |                             |            |
| 9.10 | sensitivity             | ≤0.3 uV for 12 dB SINAD   |                             |            |
| 9.11 | AF output               | 0.5 W into 150 Ω  |                             |            |
| 9.12 | power supply            | 11 to 18 VDC or wider   |                             |            |
| 9.13 | enclosure, connections  | complying with IP 54 or better  |                             |            |
| 9.14 | operating temperature   | 0 to 50°C   |                             |            |
| 9.15 | operating humidity      | 10 to 95%   |                             |            |
|      |                         |   |                             |            |

|      |                           |   |                             |            |
|------|---------------------------|---|-----------------------------|------------|
| 10.0 | <b>Battery charger</b>    | <b>as specified in bid</b>  | <b>as offered by bidder</b> | <b>Y/N</b> |
| 10.1 | supported battery type    | lead acid, 12 V nominal, maximum capacity 125 Ah                  |                             |            |
| 10.2 | charging capacity         | ≥12A, adjustable to battery type and capacity                     |                             |            |
| 10.3 | over charge protection    | on battery charge and voltage                                     |                             |            |
| 10.4 | trickle charging current  | approx. 1 A, adjustable to battery type and capacity              |                             |            |
| 10.5 | overload current trip     | approx. 15 A  |                             |            |
| 10.6 | power supply              | 220 VAC ±5%, 47 to 53 Hz, single phase                            |                             |            |
| 10.7 | enclosure, connections    | complying with IP 54 or better                                    |                             |            |
| 10.8 | operating temperature     | 0 to 50°C   |                             |            |
| 10.9 | operating humidity        | 10 to 95%   |                             |            |
|      |                           |   |                             |            |
| 11.0 | <b>Portable generator</b> | <b>as specified in bid</b>  | <b>as offered by bidder</b> | <b>Y/N</b> |
| 11.1 | engine                    | air-cooled petrol engine  |                             |            |
| 11.2 | output                    | 220 VAC ±5%, 47 to 53 Hz, single phase                            |                             |            |
| 11.3 | capacity                  | as required by the load with at least 25% overload surge capacity |                             |            |
| 11.4 | fuel consumption          | ≤0.4 kg/(kWh)   |                             |            |
| 11.5 | fuel tank capacity        | for at least 2 hours of continuous full load operation            |                             |            |
| 11.6 | starting method           | manual starting   |                             |            |
|      |                           |   |                             |            |

|      |                          |                              |                             |            |
|------|--------------------------|------------------------------|-----------------------------|------------|
| 12.0 | <b>UPS</b>               | <b>as specified in bid</b>   | <b>as offered by bidder</b> | <b>Y/N</b> |
|      | <b>general</b>           |                              |                             |            |
| 12.1 | type                     | on line                      |                             |            |
| 12.2 | capacity                 | ≥1 kVA                       |                             |            |
| 12.3 | protection               | input line fuse              |                             |            |
|      |                          | overload                     |                             |            |
|      |                          | short circuit                |                             |            |
| 12.4 | <b>indicators</b>        | power on                     |                             |            |
|      |                          | charge/discharge             |                             |            |
|      |                          | mains failure acoustic alarm |                             |            |
|      |                          |                              |                             |            |
|      | <b>performance</b>       |                              |                             |            |
| 12.5 | cut-off input voltage    | 160 to 280 VAC, 47 to 53 Hz  |                             |            |
| 12.6 | switch over to batteries | <175 VAC and >265 VAC        |                             |            |

|       |                             |  |                             |            |
|-------|-----------------------------|--|-----------------------------|------------|
| 12.7  | backup time                 | ≥60 minutes  |                             |            |
| 12.8  | inverter efficiency         | > 85%  |                             |            |
| 12.9  | overload                    | 110% continuous  |                             |            |
|       |                             |  |                             |            |
| 12.10 | <b>internal batteries</b>   |  |                             |            |
| 12.11 | DC voltage                  | ≥48 V  |                             |            |
| 12.12 | protection                  | reverse polarity connection                                  |                             |            |
|       |                             | over-charge  |                             |            |
|       |                             | too deep depletion   |                             |            |
|       |                             |  |                             |            |
| 13.0  | <b>Office computer</b>      | <b>as specified in bid</b>                                   | <b>as offered by bidder</b> | <b>Y/N</b> |
|       | <b>PC</b>                   |  |                             |            |
| 13.1  | CPU type                    | Pentium II, ≥450 MHz   |                             |            |
| 13.2  |                             | 440BX AGPset   |                             |            |
| 13.3  | internal memory             | ≥64 Mbytes 133 MHz SDRAM (PC-133), expandable to ≥256 Mbytes |                             |            |
| 13.4  | cache memory                | ≥512 kbytes L2 cache   |                             |            |
| 13.5  | hard disk                   | ≥6.0 Gbytes Ultra ATA HDU                                    |                             |            |
| 13.6  | free slots                  | ≥2 PCI, ≥1 ISA, ≥1 AGP                                       |                             |            |
| 13.7  | FDD                         | 1 - 1.44 MB FDD  |                             |            |
| 13.8  | parallel port               | 1 - EPP / ECP, bi-directional                                |                             |            |
| 13.9  | serial port                 | ≥1 - fast serial port  |                             |            |
|       |                             | ≥1 - USB port  |                             |            |
| 13.10 | mouse port                  | 1 - bus mouse port   |                             |            |
| 13.11 | video controller            | AGP with 8 Mbytes memory (expandable to 16 Mbytes)           |                             |            |
|       |                             |  |                             |            |
|       | <b>colour monitor</b>       |  |                             |            |
| 13.12 | size                        | ≥17"   |                             |            |
| 13.13 | pixels                      | ≥1024 x 768  |                             |            |
| 13.14 | video standard              | XGA/VESA 1024 or better                                      |                             |            |
| 13.15 | power supply                | 220 VAC ±25%; 47 to 53 Hz                                    |                             |            |
| 13.16 | operating temperature       | 10 to 45°C   |                             |            |
| 13.17 | humidity                    | 10 to 80%  |                             |            |
|       |                             |  |                             |            |
| 14.0  | <b>CD-recorder</b>          | <b>as specified in bid</b>                                   | <b>as offered by bidder</b> | <b>Y/N</b> |
| 14.1  | speed                       | ≥ 4 x recordable<br>≥ 2 x rewritable media                   |                             |            |
| 14.2  | housing                     | external, portable   |                             |            |
| 14.3  | power supply<br>(in office) | 220 VAC ±25%;<br>47 to 53 Hz                                 |                             |            |
| 14.4  | (on board)                  | 11 to 18 VDC or wider  |                             |            |
| 14.5  | humidity                    | 10 to 80%  |                             |            |
|       |                             |  |                             |            |

|       |                        |   |                             |            |
|-------|------------------------|---|-----------------------------|------------|
| 15.0  | <b>Plotter/printer</b> | <b>as specified in bid</b>                          | <b>as offered by bidder</b> | <b>Y/N</b> |
|       | <b>general</b>         |   |                             |            |
| 15.1  | paper sizes            | A4 to A3  |                             |            |
| 15.2  | resolution             | ≥300 dpi colour                                     |                             |            |
| 15.3  | plotting method        | raster (pen type is not effective for colour fills) |                             |            |
|       |                        |   |                             |            |
|       | <b>data formats</b>    |   |                             |            |
| 15.4  | vector                 | HPGL (1 and 2), BGL, VDF                            |                             |            |
| 15.5  | raster                 | HPRTL, TIFF 5.0                                     |                             |            |
| 15.6  | other                  | Postscript  |                             |            |
|       |                        |   |                             |            |
|       | <b>auxiliary</b>       |   |                             |            |
| 15.7  | serial                 | USB and/or RS232; ≥9600 baud                        |                             |            |
| 15.8  | power supply           | 220 VAC ±25%; 47 to 53 Hz                           |                             |            |
| 15.9  | operating temperature  | 10 to 45°C  |                             |            |
| 15.10 | humidity               | 10 to 80%   |                             |            |
|       |                        |   |                             |            |
| 16.0  | <b>Printers</b>        | <b>as specified in bid</b>                          | <b>as offered by bidder</b> | <b>Y/N</b> |
|       | <b>laser printer</b>   |   |                             |            |
| 16.1  | printing resolution    | ≥600 * 600 dpi                                      |                             |            |
| 16.2  | serial                 | USB and/or RS232; ≥9600 baud                        |                             |            |
| 16.3  | interface              | -LAN<br>-EPP / ECP, bi-directional or RS232; ≥baud  |                             |            |
| 16.4  | paper types            | plain paper, envelopes, and transparencies          |                             |            |
| 16.5  | power supply           | 220 VAC ±25%; 47 to 53 Hz                           |                             |            |
| 16.6  | operating temperature  | 10 to 45°C  |                             |            |
| 16.7  | humidity               | 10 to 80%   |                             |            |
|       |                        |   |                             |            |
|       | <b>inkjet printer</b>  |   |                             |            |
| 16.8  | printing resolution    | B/W ≥600 * 600 dpi<br>colour ≥300 * 300 dpi         |                             |            |
| 16.9  | paper size             | A3, A4, letter, executive                           |                             |            |
| 16.10 | power supply           | 220 VAC ±25%; 47 to 53 Hz                           |                             |            |
| 16.11 | operating temperature  | 10 to 45°C  |                             |            |
| 16.12 | humidity               | 10 to 80%   |                             |            |



| 17.0 | Training programme                 | as specified<br>in bid | as offered<br>by bidder |
|------|------------------------------------|------------------------|-------------------------|
| 17.1 | theory                             |                        |                         |
| 17.2 | Practice with operating manuals    |                        |                         |
| 17.3 | pilot test                         |                        |                         |
| 17.4 | follow up with maintenance manuals |                        |                         |

**Note: The bidders are requested to fill up col. 4(as offered by the bidder) only. Col. 5 will be used by the Purchaser for evaluation.**

## **Section VIII**

# **Technical Specifications**

## Technical bid evaluation

The Integrated Bathymetric System will be used to collect data on depth and bottom topology of reservoirs. Primary applications are reservoir sedimentation surveying and reservoir capacity assessment. The system comprises the following components:

### Integrated Bathymetric System

1. Hydrographic echosounder
2. sound velocity calibrator
3. differential global positioning system
4. data collection computer
5. bathymetric software for data acquisition and processing
6. programme for training of personnel.

### Survey boat and accessories

7. survey boat
8. boat trailer
9. outboard engine
10. voice radio

### Auxiliary equipment

11. battery charger
12. portable generator
13. UPS
14. office computer
15. CD-recorder
16. plotter
17. printer

A bid is regarded as technically responsive, if all the offered items fully comply with the technical specifications in compliance with the Specification Requirement Form (Page 40) and the qualification criteria.

### Technical evaluation weight table bathymetric system

| Subject                     | Maximum points |
|-----------------------------|----------------|
| echosounder                 | 20             |
| sound velocity calibrator   | 5              |
| DGPS and digital radio link | 20             |
| data collection computer    | 5              |
| surveying software          | 30             |
| system integration          | 15             |
| training                    | 5              |
| Total points                | 100            |

**Technical evaluation weight table boat and accessories**

| Subject         | Maximum Points |
|-----------------|----------------|
| survey boat     | 50             |
| boat trailer    | 5              |
| outboard engine | 35             |
| voice radio     | 10             |
| Total points    | 100            |

**Technical evaluation weight table auxiliary equipment**

| Subject            | Maximum points |
|--------------------|----------------|
| battery charger    | 15             |
| portable generator | 20             |
| UPS                | 10             |
| office computer    | 20             |
| CD-recorder        | 5              |
| plotter            | 15             |
| printer            | 15             |
| Total points       | 100            |

A bid is considered 'Technically Responsive' if :

- (a) individual item obtaining more than 50% of the respective maximum points, and
- (b) the total technical points is more than 75 points.

# INTEGRATED BATHYMETRIC SYSTEM

## Purpose

The integrated bathymetric system will be used to collect data on depth and bottom topology of reservoirs and rivers. Primary application is reservoir sedimentation surveying; products will be reservoir capacity figures as a function of depth, depth contours and bottom topology change over time.

The integrated bathymetric system shall comprise the following components:

1. echosounder
  2. sound velocity calibrator
  3. differential global positioning system
  4. data collection computer
  5. bathymetric surveying software for data acquisition, storage and processing and including a helmsman display
  6. programme for training of personnel.
- The system shall be installed on a survey boat; the boat is part of the delivery.
  - The proper functioning of the bathymetric system shall be demonstrated prior to final acceptance by the consignee.

The survey boat shall be fitted for bathymetric surveying in reservoirs. The boat shall be equipped with two outboard engines and a voice radio system. Overland, the boat shall be transported on a boat trailer.

7. survey boat
8. boat trailer
9. outboard engines
10. voice radio

To support the bathymetric system and for data processing and presentation purposes, the following auxiliary equipment shall be part of the delivery.

11. battery charger
12. portable generator
13. UPS
14. office computer
15. CD-recorder
16. plotter
17. printer

## Conditions and Requirements

### Bathymetric equipment and software

- Primary requirement is that echosounder, DGPS, data acquisition computer, software and helmsman display match with each other and are supplied/implemented as an integrated system. Therefore, the bathymetry software shall have device drivers to facilitate interfacing of a wide range of echosounders and DGPS to the data acquisition computer.
- Data exchange between data acquisition computer (a Laptop PC), echosounder and DGPS shall be efficient and error free.
- The system shall be fully Y2K compliant.
- The system shall be portable.

- The system shall be rugged and easy to install.
- The system shall be easy to operate.
- Power supply is from car-batteries or similar devices. A mains powered battery charger shall be part of the supplied system.
- While sailing pre-defined lines, the survey PC shall acquire data from the positioning system and the echosounder. All data relevant for production of charts and depth data shall be stored on the data acquisition computer, that is the survey PC.
- The helmsman shall receive steering data via a separate helmsman display, showing a left-right indicator and depth data and other data to enhance the navigation accuracy and efficiency.
- The data collection software shall be adequate for the application.
- The data collection software in relation to the survey PC shall feature ample performance for effective operation at relatively high sailing velocity maintaining the specified spatial and temporal resolution with out loss of accuracy.
- The supplier shall provide comprehensive training at the designated site for each consignee.
- As all instruments are portable, they shall be mounted in a portable transport box (e.g. an instrument flight case) with a front and rear lid. The front lid shall give access to the instruments, and the rear lid shall give access to connections for data-exchange, power and antenna.
- All cables and connectors shall be sturdy and compliant with IP65.
- All connectors/cable-ends shall bear clear identification labelling.
- All system components shall utilise SI units.

### **The survey boat**

- The survey boat shall be prepared for bathymetric surveying.
- The boat shall be fitted with three small antenna stands for: the GPS antenna, the data communication antenna and the voice radio antenna.
- The boat shall have ample space to install all equipment as required and specified for the surveying system.
- The support(s) cum racks for the equipment shall be very stable and sturdy.
- There shall be provisions to securely fix the equipment to the support.
- The boat shall have a work table for the surveyor.
- The work table shall have ample space for the survey PC, the mouse and writing space for the surveyor.
- The work table shall be in such a position relative to windows and other openings that the survey computer display can be easily read without eye strain for the surveyor due to ambient light, back lightning etc. .
- All electrical equipment shall receive power from one or more (in parallel) car batteries, the supply voltage is 12 VDC nominal.
- The batteries shall be kept in a protection box which is kept in the boat.
- The protection box shall keep the batteries dry under all weather and sailing conditions.
- The protection box shall be constructed of non corrosive and acid proof materials.
- The connections to the batteries shall be acid and corrosion proof.
- The boat shall have cable guides for fastening and protection of all cables, e.g. for power, data exchange between instruments, PC and echosounder transducers .
- At the equipment end, the cables shall be fitted with sturdy and corrosion proof connectors.
- The cable ends shall have sufficient freedom to allow easy connection and disconnection.
- The helmsman display shall be installed at a convenient place near the helmsman.

**Note :** Installation drawing showing the set up of various instruments in the boat shall be supplied by the bidder.

## **Auxiliary equipment**

- The battery chargers shall adequately and quickly charge the type of car batteries that is used on board the survey boat and at the GPS reference station.
- The battery chargers may be used on shore and/or on board the survey boat.
- The portable generator will be used to supply the battery charger and/or the UPS.
- The portable generator shall have sufficient capacity for these applications.
- The UPS will be used in an office environment to reliably deliver power to the data processing PC and the printers and plotter.
- The UPS will be used from the generator and from mains supply.
- The UPS shall be of such a design that it can withstand the power/voltage fluctuations associated with mains power supply derived from a portable generator.
- Office PCs shall be used for data processing and presentation purposes.
- The office PCs shall be optimised for the data processing and presentation application.
- The CD-recorder shall reliably record all kinds of data.
- The physical and chemical composition of the CD's shall be stable enough to allow reliable data recovery after 20 years of storage under the local climatological conditions.
- The CD-recorders and media shall be compatible with the standard CD readers of the laptop and office PC's.
- A plotter/printer shall be used for presentation of collected data and processing results.
- The plotter/printer shall be of a colour inkjet type and support the bathymetric data processing and presentation software.
- It shall be possible to use the plotter/printer on board the survey boat, with power supply from the car battery(ies), without the UPS.
- A printer shall be used for reporting and data presentation.
- The printer shall support all graphical output, in black/white, as can be generated by the bathymetric software.

# HYDROGRAPHIC ECHO-SOUNDER

## Purpose

The hydrographic echosounder shall measure depth in reservoirs and rivers and output the readings to a data collection system.

## Conditions and Requirements

- The hydrographic echosounder shall be of such a design that it operates reliably and accurately under the prevailing environmental and operational conditions.
- The echosounder shall be easy to operate and maintain.
- The echosounder shall be supplied with the accessories as needed for effective deployment.
- All materials on the echosounder exterior shall be non-corrosive.
- All cables and connectors shall be sturdy and compliant with IP65.
- The echosounder shall be of a rugged design that can cope with the prevailing shock and vibration as experienced in mobile operations and during transport.
- The echosounder shall have an expected technical lifetime of not less than 10 years.
- Operating and maintenance manuals related to the type and model of the echosounder, shall be part of the delivery.
- Power will be supplied by a standard car battery
- Power consumption shall be moderate.
- An integrated digitiser shall convert the depth readings into numerical data.
- Actual depth readings shall be digitally presented on a LCD display, and recorded by an integrated paper chart recorder or visualised on a graphic LCD display in similar fashion as a chart recording.
- The depth readings shall be transmitted by serial communication to the controlling PC.
- Within the specified supply voltage range, the displayed value shall not depend on supply voltage.
- The echosounder shall have adjustment facilities for at least draft, speed of sound, sensitivity, recording range, time dependent gain control and grey scale, control of recorder mode and paper speed.
- The indicated range shall be distance to the bottom, in meters. Hence, the echosounder should suppress multiple echoes and echoes from the water surface (backward sensitivity).
- The depth display shall be easily readable by day, exposed to direct sunlight, and at night.
- The echosounder shall have illumination on the paper chart recorder and on the digital display.
- The echosounder shall have a good performance in sediment-laden waters.
- Operation with transducers in air shall not result in damage or non-compliance with any specification when submersed again.

## Specifications

**two acoustic transducers viz.**

**acoustic transducer 1**

**acoustic frequency**                      approximately 200 kHz

**transducer beam width**                 $\leq 10$  degrees



|  |  |
|--|--|
| <b>acoustic transducer 2</b>   |  |
| <b>acoustic frequency</b>  | one frequency in the range between 15 to 45 kHz  |
| <b>transducer beam width</b>   | ≤30 degrees  |
| <b>transducers 1 and 2</b>   |  |
| <b>depth ranges</b>  | selectable up to 250 m (0 to 10, 25, 50, 100, 250 m) or equivalent                         |
| <b>minimum depth</b>   | approx. 0.3 m below transducer   |
| <b>output power</b>  | approx. 250 W  |
| <b>transducer cable length</b>   | 8 m  |
| <b>alarm</b>   | adjustable low depth indication  |
| <b>speed of sound adjustment</b>   | 1400 to 1550 m/s in steps of ≤1 m/s  |
| <b>measuring rate</b>  | ≥5 readings/second   |
| <b>digitiser accuracy</b>  | 0.25% of indicated depth   |
| <b>digitiser resolution</b>  | 0.01 m   |
| <b>gating</b>  | bottom tracking, and adjustable gate width   |
| <b>display</b>   | LCD with good daylight readability   |
| <b>interface</b>   | USB or one of RS232, RS422, RS485 for output of depth information and input of annotation. |
| <b>data format</b>   | NMEA-0183  |
| <b>update interval</b>   | 1 second   |
| <b>recording method</b>  | electrical (classic), thermal or jet paper or LCD display with printer support             |
| <b>resolution</b>  | 1 dot/cm water depth or better   |
| <b>depth scale</b>   | metric graduation pre-printed or printed automatically                                     |
| <b>recording width</b>   | ≥20 cm   |
| <b>paper length</b>  | ≥15 m  |
| <b>time scale</b>  | regular graduation pre-printed or printed automatically                                    |
| <b>recording speed</b>   | adjustable: off, 5 to 60 mm/minute   |
| <b>fix marker</b>  | under software control from PC, switch and contact   |
| <b>annotation</b>  | free text from PC, and annotation of scales and ranges.                                    |
| The automatic annotation function should support generation and annotation of scale lines and the recording of essential settings on the chart paper. At least one annotation block shall be visible in the recording window |  |
| <b>power supply</b>  | 11 to 18 VDC   |
| <b>ingress protection</b>  | the enclosure, connectors and cables shall be sturdy and splash proof                      |
| <b>operating temperature</b>   | 0 to 50°C  |
| <b>humidity</b>  | 10 to 95%  |

### Accessories

- tool set
- standard spares
- bar check device with graduated chain
- staff gauges

## **Consumables**

- 15 rolls of recording paper or equivalent printer paper sheets
- adequate spare pens, styli, ink cartridges (instrument dependent) to fully utilise the specified number of paper rolls at the lowest paper speed.

# SOUND VELOCITY CALIBRATOR

## Purpose

The sound velocity calibrator measures sound velocity in water. It is used to calibrate the sound velocity setting of high accuracy hydrographic echosounders. In particular in stratified water the speed of sound may vary over depth. Especially under such conditions the calibrator is effective to increase echosounder accuracy.

## Conditions and Requirements

- The instrument shall be of such a design that it operates reliably and accurately under the prevailing environmental and operational conditions.
- The instrument shall be easy to operate and maintain.
- The instrument shall be supplied with the accessories as needed for effective deployment.
- All materials on the instrument exterior shall be non-corrosive.
- The above water enclosure, cables and connectors shall be sturdy and IP65 compliant.
- All submersed components, including sensor, connector (if any) and cable shall be sturdy and compliant with IP68 up to a depth of more than 100 m.
- The instrument shall be of a rugged design that can cope with the prevailing shock and vibration as experienced in mobile operations and during transport.
- The instrument shall have an expected technical lifetime of not less than 10 years.
- Operating and maintenance manuals related to the type and model of the instrument, shall be part of the delivery.
- Power supply shall be from standard batteries.
- The displayed values shall not depend on supply voltage.
- A control unit with integrated display shall be connected to the submersible sensor by electrical cable.
- The sound velocity readings shall be digitally displayed on the control unit.

## Specifications

### 1. Sensor

|                       |                            |
|-----------------------|----------------------------|
| <b>accuracy</b>       | ≤1 m/s                     |
| <b>velocity range</b> | fresh/saltwater; 0 to 40°C |
| <b>sampling time</b>  | <5 seconds                 |
| <b>minimum depth</b>  | ≤1 m                       |
| <b>maximum depth</b>  | ≥100 m                     |
| <b>cable length</b>   | ≥25 m                      |

### 2. Control unit

|                              |  |
|------------------------------|--|
| <b>power supply</b>          | standard dry cell(s), e.g. AA, C or D size |
| <b>battery autonomy</b>      | ≥10.000 readings                           |
| <b>display</b>               | good readability in daylight               |
| <b>displayed units</b>       | m/s  |
| <b>resolution</b>            | ≤0.1 m/s                                   |
| <b>operating temperature</b> | 0 to 50°C                                  |
| <b>humidity</b>              | 10 to 95%                                  |
| <b>enclosure</b>             | sturdy, portable, splash proof             |

# DIFFERENTIAL GPS

## Purpose

The Differential Global Positioning System (DGPS) will be used for accurate position fixing during bathymetric surveying and for general-purpose hydrographic applications.

## Conditions and Requirements

- The system shall be of such a design that it operates reliably and accurately under the prevailing environmental and operational conditions.
- The system shall be easy to operate and maintain.
- The system shall be supplied with the accessories as needed for effective deployment.
- All materials on the system exterior shall be non-corrosive.
- All enclosures, cables and connectors shall be sturdy and compliant with IP65.
- The system shall be of a rugged design that can cope with the prevailing shock and vibration as experienced in mobile operations.
- The system shall have an expected technical lifetime of not less than 10 years.
- Operator's and technical manuals, related to the type and model of the system, shall be part of the delivery.
- Power consumption shall be moderate, to be derived from a standard car-battery
- The system shall comprise
  1. a portable reference station with a GPS receiver, a digital radio link (radio modem) and matching antennas, and
  2. a portable mobile station with a GPS receiver, a digital radio link (radio modem) and matching antennas.
- The system shall generate alert messages in case the GPS data quality deteriorates beyond required accuracy and reliability and also in case of failures at the reference station. Causes can be bad satellite configuration, ionospheric activity, data link failure and similar.
- A digital radio link shall be included to deliver the pseudo range correction data to the mobile station.
- Preferably, the digital radio link includes voice communication support (voice radio link), possibly over an analogue channel on the same radio.
- The DGPS is to be deployed on reservoirs with a maximum dimension of about 80 km. The digital radio link shall be capable to cover the full range, i.e. from the reservoir dam to the end of the reservoir.

## Specifications

### 1. Reference Station

|                                 |  |
|---------------------------------|--|
| <b>GPS receiver channels</b>    | ≥8 parallel  |
| <b>tracking characteristics</b> | L1 C/A code and carrier                              |
| <b>antenna</b>                  | external compact dome                                |
| <b>antenna cable</b>            | ≥12 m, low loss type for the GPS frequencies         |
| <b>display</b>                  | built in display for set-up, control and supervision |
| <b>keypad</b>                   | for set-up and control                               |

## 2. Mobile Station

|                                 |  |
|---------------------------------|--|
| <b>GPS receiver channels</b>    | ≥8 parallel  |
| <b>tracking characteristics</b> | L1 C/A code and carrier                              |
| <b>antenna</b>                  | external compact dome                                |
| <b>antenna cable</b>            | ≥12 m, low loss type for the GPS frequencies         |
| <b>display</b>                  | built in display for set-up, control and supervision |
| <b>keypad</b>                   | for set-up and control                               |

## 3. Digital radio link

|                                  |   |
|----------------------------------|---|
| <b>radio frequency</b>           | VHF (or UHF band)   |
| <b>transmitting power</b>        | enough to reliably cover the reservoir completely,<br>e.g. ≥5 W for medium sized reservoirs |
| <b>reference station antenna</b> | directional Yagi  |
| <b>mobile station antenna</b>    | omni-directional, co-linear   |
| <b>antenna cable</b>             | ≥12 m, low loss type for the radio modem frequencies  |
| <b>corrections</b>               | RTCM SC104 V2   |
| <b>update rate</b>               | ≥1/s  |

## 4. General

|                                |                                |
|--------------------------------|--------------------------------|
| <b>DGPS accuracy</b>           | <1 m (95% confidence level)    |
| <b>position update rate</b>    | ≥1/s                           |
| <b>data output</b>             | ASCII, serial RS232, 9600 baud |
| <b>data storage (optional)</b> | 2 PCMCIA cards of ≥4 Mb        |
| <b>power supply</b>            | 11 to 18 VDC                   |
| <b>enclosure, connections</b>  | compliant with IP65            |
| <b>operating temperature</b>   | 0 to 60°C                      |
| <b>operating humidity</b>      | 0 to 100%                      |

## Accessories

- power cords
- RS232 cables
- AC adapters (220 VAC ± 25%, 47 – 53 Hz)
- external keypad and display, e.g. by dedicated hand held terminal
- data logging storage capacity, e.g. on PCMCIA card(s)

# SURVEY PC

## Purpose

The bathymetric data collection process shall be controlled by a Survey PC. The PC acquires data from the DGPS and the echosounder, further it provides the operator and the helmsman with status and controlling information. All collected data are recorded on PC hard disk.

## Conditions and Requirements

- The Survey PC shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered during travel and operations.
- The Survey PC is intended for mobile use, therefore it shall be of a robust design.
- The Survey PC shall be shock, moisture and dust resistant.
- The Survey PC shall be easy to operate and maintain.
- The Survey PC shall be supplied with the accessories as needed for an effective bathymetric surveying application.
- The Survey PC shall have an expected technical lifetime of not less than 5 years.
- The Survey PC shall be capable to operate without any servicing.
- The data shall be collected via serial interfaces, connected to the data acquisition equipment, viz.: a hydrographic echosounder and a DGPS. A USB interface is preferred, on the condition that the interface is reliable and supported by the software, echosounder and DGPS.
- The laptop PC shall meet the interfacing requirements for the hardware, viz.: echosounder, DGPS and helmsman display. Further an external keyboard and an external mouse shall be supported. The Survey PC shall be fitted with all the required interfaces and connectors. It should be noted that the PCMCIA slots are regarded too vulnerable for field use.
- The operating system and the data collection software shall support all required interfaces, including expansions.
- Operator's and technical manuals related to the type and model of the Survey PC, the interfaces, the accessories and software shall be part of the delivery. This is quite important, as on board (site) adjustments to the PC/interfaces may be required.

## Specifications (still to be adjusted)

|                        |  |
|------------------------|--|
| <b>CPU type</b>        | Pentium III, $\geq 450$ MHz                    |
| <b>internal memory</b> | $\geq 64$ Mbytes SDRAM                         |
| <b>cache memory</b>    | 512 Kbytes L2 cache                            |
| <b>hard disk</b>       | $\geq 2$ Gbytes UATA HDU                       |
| <b>PC card slots</b>   | 2 Type II or 1 Type III slot                   |
|                        | integrated PCI bus 64 bit graphics accelerator |
|                        | PCI bus master EIDE onboard                    |
| <b>FDD</b>             | 1 1.44 MB FDD                                  |
| <b>parallel port</b>   | 1 EPP / ECP, bi-directional                    |
| <b>serial port</b>     | 2 fast serial ports (not PCMCIA!)              |
|                        | 1 PS/2 port                                    |
|                        | 1 USB (Universal Serial Bus) port              |
|                        | 1 IrDA 1.1 compatible or more recent           |
| <b>video port</b>      | output for external display                    |
| <b>video memory</b>    | $\geq 2$ Mbyte                                 |
| <b>pointing device</b> | touch pad                                      |
| <b>keyboard</b>        | standard laptop layout                         |

|                              |  |
|------------------------------|--|
| <b>display technology</b>    | TFT  |
| <b>brightness</b>            | good readability in daylight conditions  |
| <b>resolution</b>            | 800 x 600 or better  |
| <b>battery type</b>          | Lithium-ion, rechargeable  |
| <b>battery autonomy</b>      | ≥2 hours   |
| <b>power management</b>      | APM support  |
| <b>mass</b>                  | <4 kg including power adapter  |
| <b>power supply</b>          | 220 VAC ±25%; 47 to 53 Hz  |
| <b>car battery adapter</b>   | 11 to 18 VDC, of sufficient current capacity to reliably meet the power requirements of the laptop PC during field use |
| <b>operating temperature</b> | 10 to 50°C   |
| <b>humidity</b>              | 10 to 90 %   |

**Components to be supplied along side**

- external bus mouse, MS supported, mouse pad
- carrying case adequate to protect the laptop PC during field trips by jeep.

**Operating system and software**

(operating system and software to be of the latest release)

|                                  |   |
|----------------------------------|---|
| <b>operating system</b>          | MS-Windows98 on CD-ROM or later version   |
| <b>additional software</b>       | MS-Office97 professional, including WORD, EXCEL, ACCESS, PowerPoint or later version  |
| <b>virus protection software</b> | McAfee, Norton or Dr. Solomon, the software shall be compatible with the operating system and including a site licence with up-grade provision. |

# BATHYMETRIC SOFTWARE

## Purpose

The bathymetric software is required to control the data collection processes and to inform the operator and the helmsman during surveying. Further, it supports data storage, validation, processing and presentation. End products are a depth contour chart, a data file with validated x,y,z data and, optionally a Digital Terrain/Elevation Model. Primary application is assessment of storage capacity of reservoirs and monitoring of sedimentation and erosion in reservoirs.

A Survey PC controls the bathymetric data collection process. The bathymetric software assists the operator with the planning of the survey. Data are acquired from the DGPS and the echosounder. The operator and the helmsman get status and controlling information presented. All collected data are recorded on PC hard disk.

Further, the software supports pre-survey planning, data handling, editing, processing, analysis and reporting.

## Conditions and Requirements

- The bathymetric software shall be of such a design that it operates reliably and accurately under the prevailing working conditions on board of small craft and during post-processing in a remote office.
- The bathymetric software shall be Windows 98 (or its successor) based, and shall be easy to operate and maintain.
- The bathymetric software shall be supplied with the accessories as needed for effective application.
- All bathymetric software and files shall be compatible with the PC hardware and MS-Windows98 (or its successor) environment.
- The bathymetric software shall be of a robust design.
- Comprehensive operating and system manuals, related to the bathymetric software, shall be part of the delivery.
- The manuals shall also give in depth explanation of the basics and principles of bathymetric surveying and (D)GPS use.
- The bathymetric software package shall be widely accepted and adequate for preparation and execution of bathymetric surveys and the processing and presentation of the collected data.
- The bathymetric software shall have a facility to generate helmsman data. These data shall be shown on a dedicated display, i.e. both operator and helmsman use a separate display. A low power and easily readable LCD display or TFT shall be used. The helmsman display shall be part of the delivery.
- The bathymetric software shall support data conversion to connect the collected depth data to MSL.
- The software shall support grid/projection conversion from and to the most common grids/projections. In particular, local grid, UTM, WGS84 and the common Indian projections shall be supported.
- It shall be possible to operate data collection and data processing software separately, on different computers.



- The bathymetric software shall support NMEA-0183 compatible devices. The software shall provide device drivers to support a wide range of echosounders, DGPS, digitizers, plotters, scanners, etc.
- The bathymetric software shall support a wide range of echosounders and the communication standards used by GPS equipment.
- The bathymetric software shall have tools for editing the collected files, to rectify and validate the data.
- The data collection, editing, validation and processing functions shall be supervised by Quality Assurance functions.

## Specifications

The **data collection** software shall support following functions:

1. run-line preparation
2. on line datum conversion
3. collecting, processing and storing of data from the DGPS positioning system and the echosounder
4. data storage by increments of sailed distance (fix by distance interval)
5. monitoring of data acquisition related quality indicators; in particular the performance of the DGPS (HDOP, functioning of the differential mode etc.), the echosounder and the track keeping of the helmsman
6. accurate time stamping of collected data, i.e. better than 0.05 s
7. generation of annotation text for the echosounder
8. helmsman guidance by left right indication, track searching and depth information on a helmsman display, L/R indicator reversible
9. presentation of process information and providing controls to the operator
10. generation of alerts to the operator in case of echosounder and/or DGPS problems

The **data processing** software will be executed off-line. It shall support following functions:

1. combination of survey data from different files, sessions and formats
2. addition of shorelines and landmarks to the data sets and inclusion of the same in the produced maps/charts
3. digitising of paper based topographical data (maps, charts)
4. free zooming and panning of maps, charts and plots
5. drafting of 'sailed track' (depth) plots
6. generation of depth number charts
7. spike/outlier/error detection and editing supported by graphics
8. generation of TIN model and interpolation to rectangular grid
9. generation of depth contours plots
10. assessment of reservoir capacity versus depth
11. assessment of erosion and sedimentation changes (comparison with previous/other data sets). The changes shall be presented as an overlay on the depth contour map and on a 'changes map'. Areas of sedimentation, erosion and of no change should be clearly indicated.
12. assessment of net sedimentation/erosion versus depth

# SURVEY BOAT

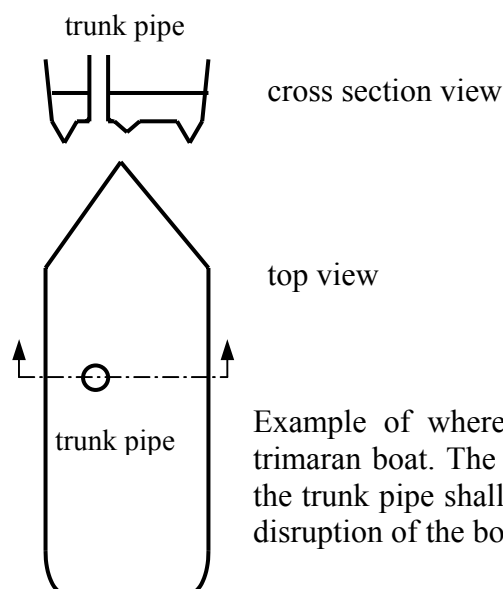
## Purpose

The survey boat will be used for bathymetric surveying to monitor reservoir sedimentation. Other applications include surveying in rivers and canals and discharge measurements by current meter and ADCP.

## Conditions and Requirements

- The boat shall be of such a design that it operates reliably and safely under the prevailing environmental and hydraulic conditions.
- The boat shall be squall resistant.
- The boat shall have a drain-off system and a self-draining cockpit to prevent any free water surface in the boat and related stability problems or damage to the equipment.
- The boat shall be capable to operate in shallow water where repeatedly the hull may impact with rock or sediment.
- All materials on the boat exterior and on wet spots inside the boat shall be non-corrosive.
- The boat shall be very sturdy, unsinkable and shall have an adequate stability.
- The boat shall have a slightly catamaran or trimaran shaped hull.
- The boat shall be easy to operate and maintain.
- All hull sections shall be accessible from the inside for quick repair of damage to the hull. The float material shall be removable to give access to the hull.
- The boat shall have an expected technical lifetime of not less than 10 years.
- The boat shall have floatation chambers filled with closed cell foam.
- The boat shall be provided with appropriate fenders.
- The boat's joints shall be designed to avoid leakage while taking into account the hostile environment of operation e.g. shallow water, high flow rate, floating debris, high sediment loads.
- The boat shall have a cabin to accommodate equipment and staff.
- The cabin shall, at port and starboard sides, have sitting benches.
- The cabin shall have provisions to safely install and operate the following equipment: echosounder, DGPS system, laptop PC, helmsman display, power supply with car batteries.
- The cabin shall have a stable table for the system operator, to spread maps and paper charts, to make notes etc.
- The cabin shall have windows and a lockable door.
- On the rear deck a workspace of approximately 3 m length over the full width of the boat shall be available to carry out hydrological measurements.
- The rear deck shall be provided with an awning.
- The boat shall be supplied with the accessories as needed for effective deployment.
- The boat shall be equipped with two outboard engines.
- The boat and the outboard engines shall be capable to operate for at least 6 months without any servicing.
- The outboard engines shall be operated by a remote control system, located at the stern side front bulkhead in the cabin.
- The control system shall have a starting switch, gear switch and a throttle system for each outboard engine and a steering wheel and emergency stop switch for simultaneous operation of the outboard engines.
- The control system shall match the outboard engines.
- Guard rail and stanchions with detachable chain will be rigged out around the deck .
- Arrangements shall be made for safe working on the boat.

- Bollards are to be provided on the deck for mooring purpose.
- A maintenance manual, related to the type and model of the boat, shall be part of the delivery.
- The boat shall be fitted with a transducer trunk pipe (transducer well).
- The internal diameter of the trunk pipe shall be sufficient to pas both the high frequency echosounder transducer and a low frequency echosounder transducer or an ADCP.
- It shall be easy to install or recover the transducers and/or the ADCP.
- The transducer trunk pipe shall be installed off centre by about 1/6 of the boat width left or right of the centre line on a trimaran shape hull and in the centre on a catamaran hull. In forward/backward direction it may be in the middle of the boat.
- The transducer trunk pipe shall have a top cover to avoid water entering the boat, in particular while sailing.
- The top cover shall pass the transducer rod and its cable but prevent water to enter the boat.
- The transducer trunk pipe shall be at least as high as the sideboards of the boat.
- The transducer trunk pipe shall be flush with the boat hull, it shall not protrude below the boat hull.
- The trunk pipe shall be tightly fixed to the boat and shall be properly supported.
- The trunk pipe shall be waterproof, corrosion proof and very sturdy. The trunk pipe shall be so constructed that it cannot break off, tear apart or suffer any other damage that may result in water entering (seeping or flushing) into the boat.
- At the lower end of the trunk pipe a bottom lid or dummy transducer shall close the trunk pipe during fast sailing. The trunk pipe lid shall be smoothly fitted in the curved shape of the hull; i.e. it should not disrupt the flow of water along the hull.
- The bottom lid shall be easily installable/removable from above through the trunk pipe, while the boat is floating.
- The transducer and support rod shall be vertically adjustable and also removable.
- The transducer and its support rod shall be tightly fixed in the trunk pipe to avoid vibrations during sailing.
- It shall be possible to immerse the transducer deeper than the lower end of the transducer trunk pipe.



Example of where the trunk pipe could be mounted in a slightly trimaran boat. The sketch is not to scale. In a catamaran shaped boat, the trunk pipe shall be installed in or close to the centre line, avoiding disruption of the boat's structural design.

## Specifications

|                          |   |
|--------------------------|---|
| <b>1. Boat</b>           |   |
| <b>material</b>          | FRP (Fibre Reinforced Plastic) or aluminium   |
| <b>length</b>            | ≥7.5 m  |
| <b>width</b>             | approx. 2.5 m   |
| <b>draft</b>             | approx. 0.5 m   |
| <b>free board</b>        | approx. 0.6 m   |
| <b>bottom shape</b>      | slightly catamaran or trimaran  |
| <b>propulsion</b>        | 2 Nos. of ≥30 kW (40 HP) outboard engines. Cruising speed shall be 20 knots or more (planing) with full load. |
| <b>carrying capacity</b> | ≥1000 kg  |
| <b>2. Cabin</b>          |   |
| <b>length</b>            | approx. 3 m   |
| <b>height</b>            | ample sitting height  |
| <b>door</b>              | lockable  |
| <b>door width</b>        | >0.8 m  |
| <b>3. Boat outfit</b>    |   |
| <b>anchor</b>            | matching the boat, fitted with sufficient rope to safely anchor in the deepest reservoir of the State         |
| <b>echosounder</b>       | indicator type for navigation purposes, fitted in the boat  |
| <b>compass</b>           | magnetic type for navigation purposes, fitted in the boat   |
| <b>fenders</b>           | ≥4 of Coir type   |
| <b>paddles</b>           | ≥4 for rowing   |
| <b>life jacket</b>       | ≥8 for each person on board, also for guests (SOLAS approved type)  |
| <b>life buoy</b>         | ≥2 pieces, one on SB and one on BB, with at least 50 m line, readily available on board                       |
| <b>fire extinguisher</b> | ≥2 pieces, net weight ≥5 kg   |

The fire extinguishers shall be readily accessible close the outboard engines and in the cabin

## Remarks

For Indian bidders, the Registrar of Shipping, Mumbai, shall approve the design and drawing. For international bidders the design and drawing shall be approved by a national agency in their country authorised for the purpose and acceptable to the purchaser.

# BOAT TRAILER

## Purpose

The boat trailer will be used to transport the survey boats to and from measuring sites.

## Conditions & Requirements

- The boat trailer shall be of such a design, that the boat can be transported reliably and safely by road, to very remote sites.
- The trailer shall be very sturdy.
- The trailer shall be immersible for loading and unloading of the boat, hence all materials shall be corrosion resistant. In particular electrical parts and bearings shall be protected against ingress of water.
- The trailer shall be easy to use and maintain.
- The trailer shall be supplied with the accessories as needed for effective use.
- The trailer shall be supplied with a spare wheel with tyre, securely fixed at an easily accessible spot.
- The trailer shall have an expected technical lifetime of not less than 10 years.
- The trailer shall have adequate and strong provisions to secure the boat.
- The trailer shall have ample and large supports fitting the shape of the boat's hull.
- The trailer shall have a safety chain to attach it to the pulling car.

## Specifications

### 1. Trailer

|                   |   |
|-------------------|---|
| <b>material</b>   | galvanised iron   |
| <b>capacity</b>   | sufficient to carry the boat with engines, petrol, tools etc. |
| <b>dimensions</b> | matching the size of the boat                                 |

### 2. Trailer outfit

|                         |   |
|-------------------------|---|
| <b>winch</b>            | with ratchet and pawl for pulling the boat onto the trailer   |
| <b>guidance rollers</b> | rubber, fitting to the shape of the boat  |
| <b>lights</b>           | removable assembly of taillights viz. red tail lights, red break-lights and orange left and right direction indicators. |
| <b>spare tyre</b>       | spare wheel with tyre   |

# OUTBOARD ENGINE

## Purpose

Two outboard engines are to propel the survey boat during bathymetric data acquisition. The boat will be operated at surveying speed and at travel speed. In large reservoirs the outboard engines should have sufficient capacity to maintain a planing cruising speed of at least 20 knots.

## Conditions and Requirements

- The outboard engine shall be of such a design that it operates reliably and safely under the prevailing environmental and hydraulic conditions as encountered during bathymetric surveying on small, medium and large reservoirs.
- The outboard engine will be used in sediment and debris laden water.
- The outboard engine will be used in shallow water with a rocky bottom.
- The outboard engine shall be easy to operate and maintain.
- The outboard engine shall be supplied with the accessories as needed for effective use.
- All materials on the outboard engine shall be non-corrosive.
- The outboard engine shall have an expected technical lifetime of not less than 5 years.
- The outboard engine shall be very sturdy.
- Operator's and maintenance manuals, related to the type and model of the outboard engine, shall be part of the delivery.
- The design of the cooling system shall be sediment and debris tolerant.
- The propeller and tail shall be impact resistant.
- The propeller shall be fitted with an adequate type of breaking pin.
- The outboard engine shall have a provision for lifting and to adjust its trimming.
- The outboard engines shall be operated by a remote control system, located at the stern side bulkhead of the cabin.
- The control system shall have a starting switch, gear switch and a throttle system for each outboard engine and a steering wheel and emergency stop switch for simultaneous operation of the outboard engines.
- For a good serviceability, the outboard engines shall be of a commonly used brand in India.

## Specifications

|                    |  |
|--------------------|--|
| <b>capacity</b>    | ≥30 kW (≥40 HP)  |
| <b>operation</b>   | remote controlled twin engine, electric start          |
| <b>fuel</b>        | petrol start, kerosene running                         |
| <b>propeller</b>   | workhorse type, to be selected during trials with boat |
| <b>tail length</b> | to match with boat                                     |
| <b>alarms</b>      | over heating, oil pressure                             |

## Accessories

All listed accessories are to be delivered for each per outboard engine.

- toolkit
- ≥10 breaking pins
- ≥2 spare propellers
- maintenance instructions and manual
- petrol tank and hoses etc.

# BATTERY CHARGER

## Purpose

The battery charger will be used to charge lead acid batteries for field operations such as bathymetric surveying.

## Conditions and Requirements

- The battery charger will be used on shore and occasionally in a survey boat.
- The battery charger shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered during field operations.
- The battery charger is to be transported from the one operational site to the other, therefore it shall be of a robust design and shock resistant.
- The battery charger shall be easy to operate and maintain.
- The battery charger shall be supplied with the accessories as needed for an effective roving application.
- The battery charger shall have an expected technical lifetime of not less than 10 years.
- The battery charger shall be capable to operate for 6 months without any servicing.
- The cables and the connector clamps off the battery charger, shall be fully acid and corrosion proof.
- The battery charger shall not be damaged by interruptions in the mains power supply.
- After a mains power interruption, the battery charger shall recover and resume the charging upon return of mains power.
- The battery charger shall be short circuit proof.
- Operator's and technical manuals related to the type and model of the battery charger shall be part of the delivery.
- The battery charger shall be small and easy to transport.

## Specifications

|                                 |  |
|---------------------------------|--|
| <b>supported battery type</b>   | lead acid, 12 V nominal, maximum capacity 125 Ah     |
| <b>charging capacity</b>        | $\geq 12A$ , adjustable to battery type and capacity |
| <b>over charge protection</b>   | on battery charge and voltage                        |
| <b>trickle charging current</b> | approx. 1 A, adjustable to battery type and capacity |
| <b>overload current trip</b>    | approx. 15 A   |
| <b>dry mass</b>                 | $\leq 10$ kg   |
| <b>power supply</b>             | 220 VAC $\pm 5\%$ , 47 to 53 Hz, single phase        |
| <b>enclosure, connections</b>   | complying with IP 54 or better                       |
| <b>operating temperature</b>    | 0 to 50°C  |
| <b>operating humidity</b>       | 10 to 95%  |

## Accessories

- voltmeter
- load indicator
- $\geq 5$  metre mains power extension cable with  $\geq 4$  sockets

## Consumables

- fuses
- battery clamp connectors

# VOICE RADIO

## Purpose

The voice radio will be used during bathymetric surveying for communications between the surveying boat and the reference station. It is required for safety and operational reasons.

## Conditions and Requirements

- The voice radio shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered during field operations.
- The voice radio is to be transported from the one operational site to the other; therefore it shall be of a robust design and shock resistant.
- The voice radio shall be easy to operate and maintain.
- The reach of the voice channel shall at least be as large as that of the digital radio link.
- The voice radio shall be supplied with the accessories as needed for an effective use.
- The voice radio shall have an expected technical lifetime of not less than 10 years.
- The voice radio shall be capable to operate without any servicing.
- The cables and the connector clamps off the voice radio, shall be fully corrosion proof.
- The voice radio shall be reverse polarity protected.
- The connections of the voice radio, in particular the antenna connection, shall be short circuit proof.
- Operator's and technical manuals related to the type and model of the voice radio shall be part of the delivery.
- The voice radio shall be small and easy to transport.
- The voice radio shall be permitted in India.
- A user licence for the voice radio in the name of the purchaser shall be part of the delivery.

## Specifications

### 1. general

|                           |                         |
|---------------------------|-------------------------|
| <b>frequency range</b>    | VHF                     |
| <b>number of channels</b> | ≥10 (all preset)        |
| <b>channel spacing</b>    | ≤25 kHz                 |
| <b>type of operation</b>  | Simplex                 |
| <b>antenna</b>            | omni-directional (whip) |

### 2. transmitter

|                                   |   |
|-----------------------------------|---|
| <b>frequency stability</b>        | ±5 ppm  |
| <b>RF power output</b>            | full coverage of the largest reservoir, e.g. ≥5 W |
| <b>suppression</b>                | 50 dB minimum (spurious and harmonic)             |
| <b>adjacent channel power</b>     | ≤-55dBc   |
| <b>intermodulation distortion</b> | less than 25 dB corresponding PEP                 |
| <b>microphone impedance</b>       | 300 Ω (Unbalanced)                                |

### 3. receiver

|                                     |                         |
|-------------------------------------|-------------------------|
| <b>frequency stability</b>          | ±10 ppm                 |
| <b>sensitivity</b>                  | ≤0.3 uV for 12 dB SINAD |
| <b>adjacent channel selectivity</b> | 60 dB                   |
| <b>intermodulation</b>              | 60 dB                   |
| <b>IF rejection</b>                 | 60 dB minimum           |



|                               |                                |
|-------------------------------|--------------------------------|
| <b>image rejection</b>        | 60 dB minimum                  |
| <b>AF output</b>              | 0.5 W into 150 $\Omega$        |
| <b>power supply</b>           | 11 to 18 VDC or wider          |
| <b>enclosure, connections</b> | complying with IP 54 or better |
| <b>operating temperature</b>  | 0 to 50°C                      |
| <b>operating humidity</b>     | 10 to 95%                      |

### **Accessories**

- telephone hand set
- low loss coaxial cable; 12 m per radio set

# PORTABLE GENERATOR

## Purpose

The portable generator is to deliver power for field operations such as bathymetric surveying, running water sampling and discharge measurements. The generator may be used for battery charging and to deliver power to a UPS. All mains powered devices, if any, will be connected to the UPS.

## Conditions and Requirements

- The generator will be used in a roving mode, being moved from one site of operation to the other.
- The generator will be used in a survey boat, field vehicle and on shore.
- The generator shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered during transport and field operations.
- The generator is intended for mobile use, therefore it shall be of a robust design.
- The generator shall be shock, moisture and dust resistant.
- The generator shall be easy to operate and maintain.
- The generator shall be supplied with the accessories as needed for an effective roving application.
- The generator shall have an expected technical lifetime of not less than 5 years.
- The generator shall be capable to operate for 1 month without any servicing.
- Operator's and technical manuals related to the type and model of the generator shall be part of the delivery.
- The generator shall be small and easy to transport, e.g. by wheelbarrow.
- A tool set for maintenance and simple repair and including a checklist of do's and don'ts shall be part of the delivery.

## Specifications

|                           |   |
|---------------------------|---|
| <b>engine</b>             | air-cooled petrol engine  |
| <b>output</b>             | 220 VAC $\pm$ 5%, 47 to 53 Hz, single phase                       |
| <b>capacity</b>           | as required by the load with at least 25% overload surge capacity |
| <b>size</b>               | sum of length, width and height less than 200 cm                  |
| <b>dry mass</b>           | $\leq$ 50 kg  |
| <b>fuel consumption</b>   | $\leq$ 0.4 kg/(kWh)   |
| <b>fuel tank capacity</b> | for at least 2 hours of continuous full load operation            |
| <b>starting method</b>    | manual starting   |
| <b>exhaust</b>            | silencer with muffler   |
| <b>environment</b>        | ingress protection complying with IP 54 or better                 |

## Accessories

- frequency indicator
- voltmeter
- load indicator
- $\geq$ 5 metre extension cable with  $\geq$ 4 AC sockets.

## Consumables

- fuel filter
- spark plug
- oil filter
- engine oil
- fuses

# UN-INTERRUPTABLE POWER SUPPLY

## Purpose

The Un-interruptable Power Supply (UPS) is primarily intended to protect electrical devices, mostly PCs, printers and other peripherals, against the effects of power interruption. In some cases, it may also be required to sustain the power supply during a considerable time to avoid production loss.

## Conditions and Requirements

- The UPS shall be of such a design that it operates reliably and accurately under the prevailing environmental and power supply conditions.
- The UPS shall be easy to operate and maintain.
- The UPS shall be supplied with the accessories as needed for effective application.
- The UPS shall have an expected technical lifetime of not less than 10 years.
- The UPS shall be capable to operate at least 6 months without any servicing.
- An operator's manual, related to the type and model of the UPS, shall be part of the delivery.
- The UPS shall react swiftly on load changes maintaining output voltage within narrow specifications.
- The UPS shall feature surge protection against damage to very high input voltages and spikes.
- The UPS shall be of a low noise or inaudible type

## Specifications

### 1. General

|                   |  |
|-------------------|--|
| <b>type</b>       | on line  |
| <b>capacity</b>   | ≥1 kVA   |
| <b>protection</b> | input line fuse<br>overload<br>short circuit                                   |
| <b>indicators</b> | power on<br>load bar graph<br>charge/discharge<br>mains failure acoustic alarm |
| <b>MTBF</b>       | ≥10000 hours (Mean Time Before Failure)  |

### 2. Performance

|                                 |   |
|---------------------------------|---|
| <b>cut-off input voltage</b>    | 160 to 280 VAC, 47 to 53 Hz   |
| <b>switch over to batteries</b> | <175 VAC and >265 VAC   |
| <b>output</b>                   | 220 VAC ±5%, 47 to 53 Hz ±1%  |
| <b>backup time</b>              | ≥60 minutes   |
| <b>inverter efficiency</b>      | >85%  |
| <b>overload</b>                 | 110% continuous<br>120% ≥30 minutes<br>150% ≥1 minute<br>200% ≥1 second |

### 3. Batteries

**DC voltage  
charge modes  
protection**

≥48 V  
trickle and boost charge  
reverse polarity connection  
over-charge  
too deep depletion

# OFFICE COMPUTER

## Purpose

The PC will be used for general-purpose hydrological, reporting and office applications.

## Conditions and requirements

- The PC shall be of such a design that it operates reliably under the prevailing environmental and power supply conditions as encountered in the bathymetry data processing office.
- The PC shall be easy to operate and maintain.
- The PC shall be supplied with the accessories as needed for effective use.
- All hardware shall be accompanied by the software and drivers that are required for installation and application of the hardware.
- The PC shall have an expected technical lifetime of not less than 5 years.
- The PC shall be capable to operate without any servicing.
- Operator's manuals and technical documentation of all hardware, including PC and peripherals, shall be part of the delivery.
- All software manuals of the installation software, operating system, utilities and applications software shall be part of the delivery.
- The video controller shall match the display specifications.
- The monitor shall deliver bright and easily viewable images.
- The pixels shall be sharp without smearing to adjacent pixels and have a high contrast ratio.
- A CD-Recorder shall be part of the delivery. The recorded CD's shall be fully compliant with the related CD standard.
- The recorded CD's shall be free of errors and fully readable by the CD readers of the portable PCs and the office PCs.

## Specifications

### 1. PC

|                         |   |
|-------------------------|---|
| <b>CPU type</b>         | Pentium III, $\geq 450$ MHz<br>440BX AGPset                                     |
| <b>internal memory</b>  | $\geq 64$ Mbytes $\geq 100$ MHz SDRAM (PC-100), expandable to $\geq 256$ Mbytes |
| <b>cache memory</b>     | $\geq 512$ kbytes L2 cache  |
| <b>hard disk</b>        | $\geq 6.0$ Gbyte Ultra ATA HDU  |
| <b>CD ROM</b>           | $\geq 32X$ speed, either internal or external                                   |
| <b>free slots</b>       | $\geq 2$ PCI, $\geq 1$ ISA, $\geq 1$ AGP  |
| <b>FDD</b>              | 1 1.44 MB FDD   |
| <b>parallel port</b>    | 1 EPP / ECP, bi-directional   |
| <b>serial port</b>      | $\geq 1$ fast serial port<br>$\geq 1$ USB port                                  |
| <b>mouse port</b>       | 1 bus mouse port  |
| <b>video controller</b> | AGP with $\geq 8$ Mbytes memory (expandable to $\geq 16$ Mbytes)                |

## 2. Colour monitor

|                |                                      |
|----------------|--------------------------------------|
| size           | ≥17"                                 |
| pixels         | ≥1024 x 768                          |
| video standard | XGA/VESA 1024 or better              |
| CD-Recorder    | ≥6 x (Recordable); ≥4 x (Rewritable) |

|                       |                           |
|-----------------------|---------------------------|
| power supply          | 220 VAC ±25%; 47 to 53 Hz |
| operating temperature | 10 to 45°C                |
| humidity              | 10 to 80%                 |

### Components to be supplied along side

- Windows keyboard
- bus-mouse, MS supported
- mouse pad

### Operating system and software

- MS-Windows98 installed and on CD-ROM, latest version
- MS-Office97 professional, including WORD, EXCEL, ACCESS, PowerPoint (on CD-ROM, latest version)

### Virus protection software

- virus protection software: McAfee, Norton or Dr. Solomon  
The virus protection software shall be compatible with the operating system and shall include a site licence with up-grade provision.

# CD RECORDER

## Purpose

The CD-recorder will be used to transport the collected surveying data files from the surveying boat to the office. Further the CD-recorder will be used for backup, archiving and data exchange purposes.

## Conditions and requirements

- The CD-recorder shall be of such a design that it operates reliably under the prevailing environmental conditions as encountered in the field, on board and in office.
- The CD recorder shall be of portable type to be used with a Survey PC.
- The CD-recorder shall be rugged and shock resistant.
- The CD-recorder shall be easy to operate and maintain.
- The CD-recorder shall be supplied with the accessories as needed for effective use.
- All supply and signal cables required to effectively use the CD-recorder shall be part of the delivery.
- Adequate and sturdy power supply devices as required for operation from mains and car battery power shall be part of the delivery.
- The CD-recorder shall have an expected technical lifetime of not less than 5 years.
- The CD-recorder shall support recording of Write Once and Rewritable media.
- The CD media shall have an expected lifetime of more than 20 years.
- The CD-recorder shall be capable to operate without any servicing.
- An operator's manual, related to the type and model of the CD-recorder, shall be part of the delivery.
- The CR-recorder, its interface and software shall be compatible with the field and office PCs and allow for reliable and un-interrupted recording.

## Specifications

### Hardware

|                              |  |
|------------------------------|--|
| <b>speed</b>                 | ≥6CD-R; ≥4 CD-RW   |
| <b>media</b>                 | CD-R and CD-RW   |
| <b>interface</b>             | EPP / ECP, bi-directional or USB                               |
| <b>housing</b>               | external, portable   |
| <b>power supply</b>          | 220 VAC ±25%; 47 to 53 Hz (in office)<br>11 to 18 VDC or wider |
| <b>operating temperature</b> | 10 to 45°C   |
| <b>humidity</b>              | 10 to 80%  |

### Software

In order to optimise the data storage efficiency, software for file selection, data compression and reporting purposes shall be implemented. The software at least shall support:

- manual file selection
- automatic file selection based on file inclusion and exclusion parameters, folder inclusion/exclusion
- file age limiting, i.e. files of older age may be ignored
- full and incremental backup support
- standard data compression technology
- error monitoring, control and recovery
- reporting functions

# PLOTTER

## Purpose

The plotter is primarily intended to output graphical data on sheet materials. Typical applications are output of GIS data, e.g. maps, charts and data analyses results.

## Conditions and Requirements

- The plotter shall be of such a design that it operates reliably and accurately under the prevailing environmental and power supply conditions.
- The plotter shall be easy to operate and maintain.
- The plotter shall be supplied with the accessories as needed for effective application.
- The plotter shall have an expected technical lifetime of not less than 10 years.
- The plotter shall be capable to operate at least 6 months without any servicing.
- Reservoirs for ink and/or dye shall be easily replaceable.
- An operator's manual, related to the type and model of the plotter, shall be part of the delivery.

## Specifications

### 1. General

|                          |   |
|--------------------------|---|
| <b>paper sizes</b>       | A4 to A3  |
| <b>absolute accuracy</b> | ≤0.25 mm of any point                               |
| <b>resolution</b>        | ≥300 dpi colour<br>≥600 dpi monochrome              |
| <b>plotting method</b>   | raster (pen type is not effective for colour fills) |

### 2. Data formats

|               |                          |
|---------------|--------------------------|
| <b>vector</b> | HPGL (1 and 2), BGL, VDF |
| <b>raster</b> | HPRTL, TIFF 5.0          |
| <b>other</b>  | Postscript               |

### 3. Auxiliary

|                              |   |
|------------------------------|---|
| <b>interfaces</b>            | LAN (shall match the purchasers network);<br>EPP / ECP, bi-directional or USB |
| <b>serial</b>                | RS232; ≥9600 baud   |
| <b>memory</b>                | 16 MB, expandable to 64 MB  |
| <b>power supply</b>          | 220 VAC ±25%; 47 to 53 Hz   |
| <b>operating temperature</b> | 10 to 45°C  |
| <b>humidity</b>              | 10 to 80%   |



# PRINTER

## Purpose

The printer is primarily intended to output text and graphical data on paper and sheet materials. Typical applications are common office use, reporting, and output of hydrological data, GIS data and the like.

## Conditions and Requirements

- The printer shall be of such a design that it operates reliably and accurately under the prevailing environmental and power supply conditions.
- The printer shall be easy to operate and maintain.
- The printer shall be supplied with the accessories as needed for effective application.
- The printer shall have an expected technical lifetime of not less than 10 years.
- The printer shall be capable to operate at least 6 months without any servicing.
- Reservoirs for ink and/or dye shall be easily replaceable.
- An operator's manual, related to the type and model of the printer, shall be part of the delivery.

The purchaser may execute his judicious discretion in the choice of configuration and options.

## • LASER PRINTER, B/W, DESKTOP

### Specifications

|                              |  |
|------------------------------|--|
| <b>printing speed</b>        | ≥12 ppm  |
| <b>printing resolution</b>   | ≥600 x 600 dpi   |
| <b>buffer capacity</b>       | ≥4 Mbytes, expendable to 8 Mbytes  |
| <b>printer language</b>      | MS-Windows compatible, enhanced PCL 5                                    |
| <b>fonts</b>                 | ≥20, and scalable fonts  |
| <b>interfaces</b>            | LAN (shall match the purchasers network) or<br>EPP / ECP, bi-directional |
| <b>serial</b>                | RS232; ≥9600 baud  |
| <b>paper size</b>            | A4, letter, executive  |
| <b>paper tray capacity</b>   | 100 sheets   |
| <b>paper types</b>           | plain paper, envelopes, and transparencies                               |
| <b>power supply</b>          | 220 VAC ±25%; 47 to 53 Hz  |
| <b>operating temperature</b> | 10 to 45°C   |
| <b>humidity</b>              | 10 to 80%  |

### Consumables:

- toner cartridges
- A4 size paper

- **INKJET PRINTER, COLOUR, A4 SIZE**

**Specifications**

|                              |   |
|------------------------------|---|
| <b>printing speed</b>        | black $\geq 3$ ppm (A4), colour $\geq 1.5$ ppm (A4)               |
| <b>printing resolution</b>   | B/W $\geq 600 \times 600$ dpi<br>Colour $\geq 300 \times 300$ dpi |
| <b>printer language</b>      | MS-Windows compatible   |
| <b>fonts</b>                 | $\geq 20$ graphics and scaleable                                  |
| <b>interface</b>             | parallel  |
| <b>paper size</b>            | A4, A3, letter, executive   |
| <b>paper tray capacity</b>   | 100 sheets plain paper  |
| <b>paper types</b>           | plain paper, envelopes and transparencies                         |
| <b>power supply</b>          | 220 VAC $\pm 25\%$ ; 47 to 53 Hz                                  |
| <b>operating temperature</b> | 10 to 45°C  |
| <b>humidity</b>              | 10 to 80%   |

**Consumables**

- black ink cartridges
- colour ink cartridges
- A4 and A3 size paper

# TRAINING PROGRAMME FOR PERSONNEL

## Purpose

The training programme is intended for all personnel that are involved with the use and operation of the bathymetric system.

## Conditions and Requirements

- The training programme shall cover all aspects of the use and operation of the bathymetric system. After successful finishing of the training, the trainees shall be capable to execute the bathymetric survey independently.
- The training programme shall commence with an introduction in bathymetric surveying.
- The training programme shall cover all relevant aspects related to the GPS and in particular accuracy and conversion from WGS84 to UTM or other Datums
- The training programme shall cover all relevant aspects related to the echosounder and in particular practical aspects such as accuracy, calibration, assessment of hard bottom depth, multiple echo's, installation precautions, data interpretation.
- The training programme shall cover all relevant aspects related to the use and operation of the data acquisition hardware and software. In particular survey preparation, survey execution, calibration, data quality monitoring and verification, trouble shooting, post survey checks and data handling and safe guarding shall be covered.
- The training programme shall cover all relevant aspects related to the use and operation of the data processing and presentation software.
- The training programme shall assess safety precautions and communication methods.
- The training materials shall comprise printed handouts in clear language covering all the training subjects.
- The training shall be executed in a classroom and on board.
- All trainees shall be given the opportunity to work with the system in a classroom environment.
- After successful completion of the classroom training the field training shall be given.
- All trainees shall get the opportunity to practise in the field on a reservoir, collecting real data.
- The training shall be concluded with an exam and the successful trainees shall receive a certificate.
- The training materials shall be available for all trainees.

**ACCEPTANCE PROTOCOL FOR PROCUREMENT  
OF  
BATHYMETRY SYSTEMS**

# Acceptance Protocol

## General

The delivery of Bathymetric Equipment and Software shall be in compliance with the Technical Specifications. To formalise the process of delivery, an Acceptance Protocol is prescribed.

The Acceptance Protocol shall serve as a formal guidance during delivery of the Bathymetry Systems. Its primary goals are twofold.

1. Ascertain the delivery and completeness of all ordered products and related documents of the Bathymetric System (equipment and software).
2. Check the functioning of the Bathymetric System, individual components (equipment and software) and the integrated system, in a formal way against the Technical Specifications by application of Acceptance Tests. The tests also verify the accuracy and performance of the equipment and software.

The Acceptance Protocol shall be executed in close co-operation between the Supplier and the Purchaser.

Products shall be accepted only if they are complete and are functioning in compliance with the requirements and Technical Specifications of the bid document and the related documents are complete and correct. The supplier shall replace defective products and any other discrepancies within 4 weeks after notice of complaint.

The acceptance of the integrated bathymetric systems shall focus on the items as presented in the Acceptance Evaluation Table, which is presented below. The aspects to assess are organised column wise.

Acceptance Evaluation Table

|    | Item                      | complete | manuals | functioning | up to spec | power | training |
|----|---------------------------|----------|---------|-------------|------------|-------|----------|
| 1  | echosounder               |          |         |             |            |       |          |
| 2  | sound velocity calibrator |          |         |             |            |       |          |
| 3  | DGPS                      |          |         |             |            |       |          |
|    | digital radio link        |          |         |             |            |       |          |
| 4  | data collection PC        |          |         |             |            |       |          |
| 5  | surveying software        |          |         |             |            |       |          |
|    | processing software       |          |         |             |            |       |          |
|    | helmsman display          |          |         |             |            |       |          |
|    | system integration        |          |         |             |            |       |          |
| 6  | training programme        |          |         |             |            |       |          |
| 7  | survey boat               |          |         |             |            |       |          |
| 8  | boat trailer              |          |         |             |            |       |          |
| 9  | outboard engine           |          |         |             |            |       |          |
| 10 | voice radio link          |          |         |             |            |       |          |
| 11 | battery charger           |          |         |             |            |       |          |
| 12 | portable generator        |          |         |             |            |       |          |
| 13 | UPS                       |          |         |             |            |       |          |

|    |                 |  |  |  |  |  |  |
|----|-----------------|--|--|--|--|--|--|
| 14 | office computer |  |  |  |  |  |  |
| 15 | CD-recorder     |  |  |  |  |  |  |
| 16 | plotter         |  |  |  |  |  |  |
| 17 | printer         |  |  |  |  |  |  |
| 18 | commissioning   |  |  |  |  |  |  |

## Execution

The Acceptance Protocol aims to ascertain the proper functioning of all items in compliance with the Technical Specifications. Failing to meet the Technical Specifications and Requirements, results in rejection of the items concerned until the deficiency has been remedied and the Technical Specifications and Requirements are met to the complete satisfaction of the Purchaser.

Qualified specialists, under responsibility of a test manager, shall execute the Acceptance Tests. The progress of the Acceptance Tests is monitored and supervised by the Purchaser and/or his authorised representative. After assessment of the test results, the Purchaser may conclude that tests have to be redone or additional tests are to be executed as he deems fit. The Purchaser's test party has the right of access to any item and may request any data or information at any time. The Supplier has the obligation to deliver requested information without delay; i.e. all collected test data and documents must be kept available at the test site.

All activities (what, when, where, who, which instrument, etc.) are to be annotated systematically and uniquely linked to the individual instruments.

For each of the Bathymetric Systems, the acceptance tests shall be executed at the Purchasers' premises. The final commissioning shall take place after installation of the integrated Bathymetric Systems on board of the Purchasers' survey boats, in each of the states.

### Test preparation

Prior to the execution of the Acceptance Test, the Supplier shall prepare a detailed test script to complete satisfaction of the Purchaser. The test script shall define:

- test sequence
- the test conditions and requirements for each test
- assistance by the Purchaser
- location of the test
- person(s) responsible for conducting the tests
- reporting requirements
- handling of failures and problems
- responsibilities of all parties involved

### Evaluation of results

The observations and data collected during execution of the Acceptance Protocol, have to be evaluated and results and conclusion shall be reported. Items that do not meet the bid specifications, shall be replaced by properly functioning and satisfactorily tested items of the same type.

The Acceptance Report lays down the observations and data collected during the execution of the Acceptance Protocol and is a formal document to record the acceptance or rejection of any item as covered in the Bid Document. The forms and checklists filled during the execution of the Acceptance Protocol are to be enclosed with the Acceptance Report. It is the

obligation of the Purchaser to provide the Supplier a signed copy of the Acceptance Report, as soon as all items of a tested Bathymetric System have passed the Acceptance Tests to the complete satisfaction of the Purchaser. The Supplier can use the signed Acceptance Report as proof that the items listed in the report were accepted.

Next Chapters give instructions for the acceptance procedure and test and verification requirements of each of the items. These instructions are not comprehensive but aim to guide the Supplier in the preparation of the Acceptance Test Plan.

## 1. Completeness

### • **Item count**

For each item the completeness of the delivery is verified. The following parts will be assessed:

1. the item proper
2. cables, connectors
3. accessories
4. spares
5. manuals and guidelines
6. software dongles

### • **Visual Inspection**

Visual inspection includes the following activities.

- on all items visual check for damage, e.g. on cables, and housing
- availability of non-removable identification codes, e.g. serial number, type/model, manufacturer
- on each cable name/identification code, indication to which device it is to be connected, e.g. PC, echosounder, DGPS, Power Supply etc.
- the protection against wrongly connecting cables
- connectors, cable glands, cables and housing must be suitable for the environment of operation, be it submersed (IP68), on board (IP55) or exposed to the environment (IP65). In case of doubt, (all) items may be tested for compliance with the associated IP rating.

### • **Documents**

The following documents shall accompany the delivery of the instruments and software:

1. Administrative and QA documents
  - These documents shall include:
    - production and test documents associated with the instruments
    - shipping documents indicating instrument/product type, serial number
2. Test and calibration documents

A comprehensive Method Statement on the applied calibration and in-factory end-test procedures shall be part of the delivery. The Method Statement defines the test and calibration methods applied on the instruments and the components thereof. The Method Statement shall also include, for each calibrated product, an audit trail to national standards on all instruments and facilities used for end-testing and calibration. The Audit Trail Report shall associate the calibration of the reference instruments and test equipment to the national calibration standards.

Conditions during calibration, such as room and/or instrument temperature, equipment and facilities used, shall be included in the calibration and end-test documents.

The end-test and calibration documents shall summarise the data generated during calibration and testing, including:

- calibration and end-test data on all measuring instruments
- test data on performance over the specified temperature range
- humidity/moisture test
- spray test on enclosure(s), connectors and cables

All documents shall have identification and references to subject or instrument, date, time, location and officer in charge.

## **2. Manuals and guidelines**

For each item the availability and adequacy of the manuals and guidelines shall be verified.

The manuals shall meet the requirements on style and clarity, completeness, preciseness, detail and accessibility. This includes:

- system manual
- operation, maintenance and service manuals
- user's guideline, and
- training handouts

## **3. Training**

The effectiveness of the training shall be verified through discussion with the trainees and performance monitoring while preparing and executing a bathymetric survey.



**SPECIFICATIONS AND REQUIREMENT FORM  
RELATED TO  
BID ON  
DELIVERY OF BATHYMETRIC SYSTEMS**

**HYDROLOGY PROJECT INDIA**

**SPECIFICATIONS AND REQUIREMENT FORM RELATED TO BID ON DELIVERY OF BATHYMETRIC SYSTEMS; REF BID NO.:.....**

Summary of Instructions

Particulars of Manufacturer and local agent cum representative are to be given under rows Model and Address.

**All** entry boxes in column 4 (as per bid) of the equipment specifications shall be filled-in accurately and comprehensively. Quantitative fields shall be filled in accurately. It is not acceptable to use Yes, No, Compliant or similar not specific words.

Requested materials and information shall be enclosed with the bid and be unambiguously associated with instruments as offered in the bid.

Negligence to comply with the instructions and requirements as stated above makes the bid liable to be rejected.

The bidder's experience with the offered equipment should be clearly reflected.

**Particulars of offered items and Addresses of manufacturers.**

|         |   |  |
|---------|---|--|
| Model   | <b>Echosounder</b><br>Model/type  |  |
| Address | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|         | <b>Sound velocity calibrator</b><br>Model/type                            |  |
|         | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|         | <b>DGPS</b><br>Model/type   |  |
|         | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |

|  |   |  |
|--|---|--|
|  | <b>Digital radio link</b><br>model/type                                   |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Data collection PC</b><br>model/type                                   |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Bathymetry software</b><br>model/type                                  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Survey boat</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Boat trailer</b><br>model/type   |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Outboard engine</b><br>model/type                                      |  |

|  |   |  |
|--|---|--|
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Voice radio</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Battery charger</b><br>model/type                                      |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Portable generator</b><br>model/type                                   |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>UPS</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Office computer</b><br>model/type                                      |  |

|  |   |  |
|--|---|--|
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>CD-recorder</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Plotter</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |
|  | <b>Printer</b><br>model/type  |  |
|  | <b>Manufacturer</b><br>Name<br>Place<br>Tel:<br>Fax:<br>E-mail:<br>WWWeb: |  |

## Equipment Specifications

| 1.0  | <b>Echosounder</b>           | as specified   | as per bid | y/n |
|------|------------------------------|--|------------|-----|
|      | <b>acoustic transducer 1</b> |  |            |     |
| 1.1  | acoustic frequency           | approximately 200 kHz  |            |     |
| 1.2  | sound beam width             | ≤10 degrees  |            |     |
|      | <b>acoustic transducer 2</b> |  |            |     |
| 1.3  | acoustic frequency           | one frequency in the range between 15 to 45 kHz  |            |     |
| 1.4  | sound beam width             | ≤30 degrees  |            |     |
|      | <b>transducers 1 and 2</b>   |  |            |     |
| 1.5  | depth ranges                 | selectable up to 250 m (0 to 10, 25, 50, 100, 250 m or equivalent)                         |            |     |
| 1.6  | minimum depth                | approx. 0.3 m below transducer   |            |     |
| 1.7  | output power                 | approx. 250 W  |            |     |
| 1.8  | transducer cable length      | ≥8 m   |            |     |
|      |                              |  |            |     |
| 1.9  | alarm                        | low depth indication   |            |     |
| 1.10 | speed of sound adjustment    | 1400 to 1550 m/s in steps of 1 m/s   |            |     |
| 1.11 | measuring rate               | ≥5 readings/second   |            |     |
| 1.12 | digitised accuracy           | 0.25% of indicated depth   |            |     |
| 1.13 | digitised resolution         | 0.01 m or better   |            |     |
| 1.14 | gating                       | bottom tracking, and adjustable gate width   |            |     |
| 1.15 | display                      | LCD with good daylight readability   |            |     |
| 1.16 | interface                    | USB or one of RS232, RS422, RS485 for output of depth information and input of annotation. |            |     |
| 1.17 | data format                  | NMEA-0183  |            |     |
| 1.18 | update interval              | ≤1 second  |            |     |
|      |                              |  |            |     |
|      | <b>paper recorder</b>        |  |            |     |
| 1.19 | recording method             | electrical (classic), thermal or jet paper   |            |     |
| 1.20 | resolution                   | 1 dot/cm water depth or better   |            |     |
| 1.21 | depth scale                  | metric graduation pre-printed or printed automatically                                     |            |     |
| 1.22 | recording width              | ≥20 cm   |            |     |
| 1.23 | paper length                 | ≥15 m  |            |     |
| 1.24 | time scale                   | regular graduation pre-printed or printed automatically                                    |            |     |
| 1.25 | recording speed              | adjustable: off, 5 to 60 mm/minute   |            |     |

|      |                                  |  |            |     |
|------|----------------------------------|--|------------|-----|
| 1.26 | fix marker                       | under software control from PC, switch and contact                     |            |     |
| 1.27 | annotation                       | free text from PC, and annotation of scales and ranges.                |            |     |
|      |                                  |  |            |     |
| 1.28 | power supply                     | 11 to 18 VDC or wider  |            |     |
| 1.29 | ingress protection               | the enclosure, connectors and cables should be sturdy and splash proof |            |     |
| 1.30 | operating temperature            | 0 to 50°C  |            |     |
| 1.31 | humidity                         | 10 to 95%  |            |     |
|      |                                  |  |            |     |
| 2.0  | <b>Sound Velocity Calibrator</b> | as specified   | as per bid | y/n |
|      | <b>sensor</b>                    |  |            |     |
| 2.1  | accuracy                         | ≤1 m/s   |            |     |
| 2.2  | velocity range                   | fresh/saltwater; 0 to 40°C   |            |     |
| 2.3  | sampling time                    | <5 seconds   |            |     |
| 2.4  | minimum depth                    | ≤1 m   |            |     |
| 2.5  | maximum depth                    | ≥100 m   |            |     |
| 2.6  | cable length                     | ≥25 m  |            |     |
|      |                                  |  |            |     |
|      | <b>control unit</b>              |  |            |     |
| 2.7  | power supply                     | standard dry cell(s), e.g. AA, C or D size                             |            |     |
| 2.8  | battery autonomy                 | ≥10.000 readings   |            |     |
| 2.9  | display                          | good readability in daylight   |            |     |
| 2.10 | displayed units                  | m/s  |            |     |
| 2.11 | resolution                       | ≤0.1 m/s   |            |     |
| 2.12 | operating temperature            | 0 to 50°C  |            |     |
| 2.13 | humidity                         | 10 to 95%  |            |     |
| 2.14 | enclosure                        | sturdy, portable, splash proof   |            |     |
|      |                                  |  |            |     |
| 3.0  | <b>DGPS</b>                      | as specified   | as per bid | y/n |
|      | <b>reference station</b>         |  |            |     |
| 3.1  | GPS receiver channels            | ≥8 parallel  |            |     |
| 3.2  | tracking characteristics         | L1 C/A code and carrier  |            |     |
| 3.3  | antenna                          | external compact dome  |            |     |
| 3.4  | antenna cable                    | ≥12 m, low loss type for the GPS frequencies                           |            |     |
| 3.5  | display                          | built in display for set-up, control and supervision                   |            |     |
| 3.6  | keypad                           | for set-up and control   |            |     |
|      |                                  |  |            |     |

|      |                           |  |            |     |
|------|---------------------------|--|------------|-----|
|      | <b>mobile station</b>     |  |            |     |
| 3.7  | GPS receiver channels     | ≥8 parallel  |            |     |
| 3.8  | tracking characteristics  | L1 C/A code and carrier                              |            |     |
| 3.9  | antenna                   | external compact dome                                |            |     |
| 3.10 | antenna cable             | ≥12 m, low loss type for the GPS frequencies         |            |     |
| 3.11 | display                   | built in display for set-up, control and supervision |            |     |
| 3.12 | keypad                    | for set-up and control                               |            |     |
|      |                           |  |            |     |
|      | <b>digital radio link</b> |  |            |     |
| 3.13 | radio frequency           | VHF (or UHF) band                                    |            |     |
| 3.14 | reference station antenna | directional Yagi                                     |            |     |
| 3.15 | mobile station antenna    | omni-directional, co-linear                          |            |     |
| 3.16 | antenna cable             | ≥12 m, low loss type for the radio modem frequencies |            |     |
| 3.17 | corrections input         | RTCM SC104 V2 or later                               |            |     |
| 3.18 | update rate               | ≥1/s   |            |     |
|      |                           |  |            |     |
|      | <b>general</b>            |  |            |     |
| 3.19 | DGPS accuracy             | <1 m (95% confidence level)                          |            |     |
| 3.20 | position update rate      | ≥1/s   |            |     |
| 3.21 | data output               | ASCII, serial RS232, 9600 baud                       |            |     |
| 3.22 | data storage (optional)   | 2 PCMCIA cards of ≥4 Mb                              |            |     |
| 3.23 | power supply              | 11 to 18 VDC or wider                                |            |     |
| 3.24 | enclosure, connections    | compliant with IP65                                  |            |     |
| 3.25 | operating temperature     | 0 to 60°C  |            |     |
| 3.26 | operating humidity        | 0 to 100%  |            |     |
|      |                           |  |            |     |
| 4.0  | <b>Laptop PC</b>          | as specified   | as per bid | y/n |
| 4.1  | CPU type                  | Pentium II, ≥333 MHz                                 |            |     |
| 4.2  | Internal memory           | ≥64 Mbytes SDRAM                                     |            |     |
| 4.3  | Cache memory              | ≥512 Kbytes L2                                       |            |     |
| 4.4  | Hard disk                 | ≥2 Gbytes UATA HDU                                   |            |     |
| 4.5  | PC card slots             | 2 Type II or 1 Type III slot                         |            |     |
| 4.6  | FDD                       | 1.44 MB FDD  |            |     |
| 4.7  | parallel port             | EPP / ECP, bi-directional                            |            |     |
| 4.8  | serial ports              | ≥2 fast serial ports                                 |            |     |
|      |                           | PS/2 port  |            |     |
|      |                           | USB  |            |     |
|      |                           | IrDA 1.1 compatible or more recent                   |            |     |
| 4.9  | video port                | output for external CRT display                      |            |     |



|      |                           |   |  |  |
|------|---------------------------|---|--|--|
| 4.10 | video memory              | ≥2 Mbyte                                |  |  |
| 4.11 | pointing device           | touch pad and mouse                     |  |  |
| 4.12 | keyboard                  | standard laptop layout                  |  |  |
| 4.13 | display technology        | TFT                                     |  |  |
| 4.14 | brightness                | good readability in daylight conditions |  |  |
| 4.15 | resolution                | 800 x 600 or better                     |  |  |
| 4.16 | battery type              | Lithium-ion, rechargeable               |  |  |
| 4.17 | battery autonomy          | ≥2 hours                                |  |  |
| 4.18 | power management          | APM support                             |  |  |
| 4.19 | mass                      | <4 kg including power adapter           |  |  |
| 4.20 | power supply              | 220 VAC ±25%; 47 to 53 Hz               |  |  |
| 4.21 | car battery adapter       | 11 to 18 VDC or wider                   |  |  |
| 4.22 | operating temperature     | 10 to 50°C                              |  |  |
| 4.23 | humidity                  | 10 to 90% RH                            |  |  |
| 4.24 | operating system          | MS-Windows98 on CD-ROM with manuals     |  |  |
| 4.25 | additional software       | MS-Office97 professional with manuals   |  |  |
| 4.26 | virus protection software | McAfee, Norton or Dr. Solomon           |  |  |

## Software specifications

|      |  |     |
|------|--|-----|
| 5.0  | <b>Bathymetric Software</b>  | y/n |
|      | <b>Data Collection Software Functions</b>  |     |
| 5.1  | run-line preparation   |     |
| 5.2  | on line datum conversion   |     |
| 5.3  | collecting, processing and storing of data from the DGPS positioning system and the echosounder  |     |
| 5.4  | data storage by increments of sailed distance (fix by distance)  |     |
| 5.5  | monitoring of data acquisition related quality indicators; in particular the performance of the DGPS (HDOP, functioning of the differential mode etc.), the echosounder and the track keeping of the helmsman  |     |
| 5.6  | accurate time stamping of collected data, i.e. better than 0.05 s  |     |
| 5.7  | generation of annotation text for the echosounder  |     |
| 5.8  | helmsman guidance by left right indication and track searching and depth information on a helmsman display   |     |
| 5.9  | presentation of process information and providing controls to the operator   |     |
| 5.10 | generation of alerts to the operator in case of echosounder and/or DGPS problems   |     |
|      |  |     |
|      | <b>Data Processing Software Functions</b>  |     |
| 5.11 | combination of survey data from different files, sessions and formats  |     |
| 5.12 | addition of shorelines and landmarks to the data sets and inclusion of the same in the produced maps/charts  |     |
| 5.13 | digitising of paper based topological data (maps, charts)  |     |
| 5.14 | free zooming and panning of maps, charts and plots   |     |
| 5.15 | drafting of 'sailed track' (depth) plots   |     |
| 5.16 | generation of depth number charts  |     |
| 5.17 | spike/outlier/error detection and editing supported by graphics  |     |
| 5.18 | generation of TIN model and interpolation to rectangular grid  |     |
| 5.19 | generation of depth contours plots   |     |
| 5.20 | assessment of reservoir capacity versus depth  |     |
| 5.21 | assessment of erosion and sedimentation changes (comparison of with previous/other data sets). The changes shall be presented as an overlay on the depth contour map and on a 'changes map'. Areas of sedimentation, erosion and of no change should be clearly indicated. |     |
| 5.22 | assessment of net sedimentation/erosion versus depth   |     |
|      |  |     |
| 6.0  | Training programme   |     |
| 6.1  | theory   |     |
| 6.2  | practice   |     |
| 6.3  | test   |     |
| 6.4  | follow up  |     |

## Auxiliary specifications

|      |                       |   |            |     |
|------|-----------------------|---|------------|-----|
| 7.0  | <b>FRP Boat</b>       | as specified  | as per bid | y/n |
| 7.1  | material              | FRP or aluminium  |            |     |
| 7.2  | length                | ≥7.5 m  |            |     |
| 7.3  | width                 | approx. 2.5 m   |            |     |
| 7.4  | draft                 | approx. 0.5 m   |            |     |
| 7.5  | free board            | approx. 0.6 m   |            |     |
| 7.6  | bottom shape          | flat or slightly catamaran  |            |     |
| 7.7  | propulsion            | 2 Nos. of ≥30 kW (≥40 HP) outboard engines. Cruising speed shall be 20 knots or more with full load.  |            |     |
| 7.8  | carrying capacity     | ≥1000 kg  |            |     |
|      |                       |   |            |     |
|      | <b>Cabin</b>          |   |            |     |
| 7.9  | length                | approx. 3 m   |            |     |
| 7.10 | height                | ample sitting height  |            |     |
| 7.11 | door                  | lockable  |            |     |
| 7.12 | door width            | >0.8 m  |            |     |
|      |                       |   |            |     |
|      | <b>Boat outfit</b>    |   |            |     |
| 7.13 | anchor                | matching the boat, fitted with sufficient rope to safely anchor in the deepest reservoir of the State |            |     |
| 7.14 | echosounder           | indicator type for navigation purposes, fitted in the boat  |            |     |
| 7.15 | compass               | magnetic type for navigation purposes, fitted in the boat   |            |     |
| 7.16 | fenders               | ≥4 of Coir type   |            |     |
| 7.17 | paddles               | ≥4 for rowing   |            |     |
| 7.18 | life jacket           | ≥8 pieces, for each person on board, also for guests  |            |     |
| 7.19 | life buoy             | ≥2 pieces, one on SB and one on BB, with at least 50 m line, readily available on board               |            |     |
| 7.20 | fire extinguisher     | >2 pieces, net weight ≥5 kg   |            |     |
|      |                       |   |            |     |
| 8.0  | <b>Trailer</b>        | as specified  | as per bid | y/n |
| 8.1  | material              | galvanised iron   |            |     |
| 8.2  | capacity              | sufficient to carry the boat with engines, petrol, tools etc.   |            |     |
| 8.3  | dimensions            | matching the size of the boat   |            |     |
|      |                       |   |            |     |
|      | <b>trailer outfit</b> |   |            |     |
| 8.4  | winch                 | with ratchet and pawl for pulling the boat onto the trailer   |            |     |
| 8.5  | guidance rollers      | rubber, fitting to the shape of the boat  |            |     |

|       |                              |   |            |     |
|-------|------------------------------|---|------------|-----|
| 8.6   | lights                       | removable assembly of taillights viz. red tail lights, red break-lights and orange left and right direction indicators. |            |     |
| 8.7   | spare tyre                   | spare wheel with tyre   |            |     |
| 9.0   | <b>Outboard engines</b>      |   |            |     |
| 9.1   | capacity                     | ≥30 kW (≥40 HP)   |            |     |
| 9.2   | operation                    | remote controlled twin engine, electric start   |            |     |
| 9.3   | fuel                         | petrol start, kerosene running  |            |     |
| 9.4   | propeller                    | workhorse type, to be selected during trials with boat  |            |     |
| 9.5   | tail length                  | to match with boat  |            |     |
| 9.6   | alarms                       | over heating, oil pressure  |            |     |
| 10.0  | <b>Voice radio</b>           | as specified  | as per bid | y/n |
|       | <b>general</b>               |   |            |     |
| 10.1  | frequency range              | VHF   |            |     |
| 10.2  | number of channels           | ≥10 (all preset)  |            |     |
| 10.3  | channel spacing              | ≤25 kHz   |            |     |
| 10.4  | type of operation            | Simplex   |            |     |
| 10.5  | antenna                      | omni-directional (whip)   |            |     |
|       | <b>transmitter</b>           |   |            |     |
| 10.6  | frequency stability          | ±5 ppm  |            |     |
| 10.7  | RF power output              | full coverage of the largest reservoir, e.g. ≥5 W   |            |     |
| 10.8  | suppression                  | 50 dB minimum (spurious and harmonic)   |            |     |
| 10.9  | adjacent channel power       | ≤-55dBc   |            |     |
| 10.10 | intermodulation distortion   | less than 25 dB corresponding PEP   |            |     |
| 10.11 | microphone impedance         | 300 Ω (Unbalanced)  |            |     |
|       | <b>receiver</b>              |   |            |     |
| 10.12 | frequency stability          | ±10 ppm   |            |     |
| 10.13 | sensitivity                  | ≤0.3 uV for 12 dB SINAD   |            |     |
| 10.14 | adjacent channel selectivity | 60 dB   |            |     |
| 10.15 | intermodulation              | 60 dB   |            |     |
| 10.16 | IF rejection                 | 60 dB minimum   |            |     |
| 10.17 | image rejection              | 60 dB minimum   |            |     |
| 10.18 | AF output                    | 0.5 W into 150 Ω  |            |     |

|       |                           |   |            |     |
|-------|---------------------------|---|------------|-----|
| 10.19 | power supply              | 11 to 18 VDC or wider   |            |     |
| 10.20 | enclosure, connections    | complying with IP 54 or better                                    |            |     |
| 10.21 | operating temperature     | 0 to 50°C   |            |     |
| 10.22 | operating humidity        | 10 to 95%   |            |     |
|       |                           |   |            |     |
| 11.0  | <b>Battery charger</b>    | as specified  | as per bid | y/n |
| 11.1  | supported battery type    | lead acid, 12 V nominal, maximum capacity 125 Ah                  |            |     |
| 11.2  | charging capacity         | ≥12A, adjustable to battery type and capacity                     |            |     |
| 11.3  | over charge protection    | on battery charge and voltage                                     |            |     |
| 11.4  | trickle charging current  | approx. 1 A, adjustable to battery type and capacity              |            |     |
| 11.5  | overload current trip     | approx. 15 A  |            |     |
| 11.6  | dry mass                  | ≤10 kg  |            |     |
| 11.7  | power supply              | 220 VAC ±5%, 47 to 53 Hz, single phase                            |            |     |
| 11.8  | enclosure, connections    | complying with IP 54 or better                                    |            |     |
| 11.9  | operating temperature     | 0 to 50°C   |            |     |
| 11.10 | operating humidity        | 10 to 95%   |            |     |
|       |                           |   |            |     |
| 12.0  | <b>Portable generator</b> | as specified  | as per bid | y/n |
| 12.1  | engine                    | air-cooled petrol engine  |            |     |
| 12.2  | output                    | 220 VAC ±5%, 47 to 53 Hz, single phase                            |            |     |
| 12.3  | capacity                  | as required by the load with at least 25% overload surge capacity |            |     |
| 12.4  | size                      | sum of length, width and height less than 200 cm                  |            |     |
| 12.5  | dry mass                  | ≤50 kg  |            |     |
| 12.6  | fuel consumption          | ≤0.4 kg/(kWh)   |            |     |
| 12.7  | fuel tank capacity        | for at least 2 hours of continuous full load operation            |            |     |
| 12.8  | starting method           | manual starting   |            |     |
| 12.9  | exhaust                   | silencer with muffler   |            |     |
| 12.10 | environment               | ingress protection complying with IP 54 or better                 |            |     |
|       |                           |   |            |     |
| 13.0  | <b>UPS</b>                | as specified  | as per bid | y/n |
|       | <b>general</b>            |   |            |     |
| 13.1  | type                      | on line   |            |     |
| 13.2  | capacity                  | ≥1 kVA  |            |     |
| 13.3  | protection                | input line fuse   |            |     |
|       |                           | overload  |            |     |
|       |                           | short circuit   |            |     |

|       |                           |  |            |     |
|-------|---------------------------|--|------------|-----|
| 13.4  | <b>indicators</b>         | power on   |            |     |
|       |                           | load bar graph   |            |     |
|       |                           | charge/discharge   |            |     |
|       |                           | mains failure acoustic alarm                                 |            |     |
| 13.5  | MTBF                      | ≥10000 hours (Mean Time Before Failure)                      |            |     |
|       |                           |  |            |     |
|       | <b>performance</b>        |  |            |     |
| 13.6  | cut-off input voltage     | 160 to 280 VAC, 47 to 53 Hz                                  |            |     |
| 13.7  | switch over to batteries  | <175 VAC and >265 VAC  |            |     |
| 13.8  | output                    | 220 VAC ±5%, 47 to 53 Hz                                     |            |     |
| 13.9  | backup time               | ≥60 minutes  |            |     |
| 13.10 | inverter efficiency       | > 85%  |            |     |
| 13.11 | overload                  | 110% continuous  |            |     |
|       |                           | 120% ≥30 minutes   |            |     |
|       |                           | 150% ≥1 minute   |            |     |
|       |                           | 200% ≥1 second   |            |     |
|       |                           |  |            |     |
|       | <b>internal batteries</b> |  |            |     |
| 13.12 | DC voltage                | ≥48 V  |            |     |
| 13.13 | charge modes              | trickle and boost charge                                     |            |     |
| 13.14 | protection                | reverse polarity connection                                  |            |     |
|       |                           | over-charge  |            |     |
|       |                           | too deep depletion   |            |     |
|       |                           |  |            |     |
| 14.0  | <b>Office computer</b>    | as specified   | as per bid | y/n |
|       | <b>PC</b>                 |  |            |     |
| 14.1  | CPU type                  | Pentium II, ≥450 MHz   |            |     |
|       |                           | 440BX AGPset   |            |     |
| 14.2  | internal memory           | ≥64 Mbytes 100 MHz SDRAM (PC-100), expandable to ≥256 Mbytes |            |     |
| 14.3  | cache memory              | ≥512 kbytes L2 cache   |            |     |
| 14.4  | hard disk                 | ≥6.0 Gbyte Ultra ATA HDU                                     |            |     |
| 14.5  | CD ROM                    | ≥32X speed, either internal or external                      |            |     |
| 14.6  | free slots                | ≥2 PCI, ≥1 ISA, ≥1 AGP                                       |            |     |
| 14.7  | FDD                       | 1 - 1.44 MB FDD  |            |     |
| 14.8  | parallel port             | 1 - EPP / ECP, bi-directional                                |            |     |
| 14.9  | serial port               | ≥1 - fast serial port  |            |     |
|       |                           | ≥1 - USB port  |            |     |
| 14.10 | mouse port                | 1 - bus mouse port   |            |     |
| 14.11 | video controller          | AGP with 8 Mbytes memory (expandable to 16 Mbytes)           |            |     |
|       |                           |  |            |     |

|       |                             |  |            |     |
|-------|-----------------------------|--|------------|-----|
|       | <b>colour monitor</b>       |  |            |     |
| 14.12 | size                        | ≥17"   |            |     |
| 14.13 | pixels                      | ≥1024 x 768  |            |     |
| 14.14 | video standard              | XGA/VESA 1024 or better                                |            |     |
|       |                             |  |            |     |
| 14.15 | power supply                | 220 VAC ±25%; 47 to 53 Hz                              |            |     |
| 14.16 | operating temperature       | 10 to 45°C   |            |     |
| 14.17 | humidity                    | 10 to 80%  |            |     |
|       |                             |  |            |     |
| 15.0  | <b>CD-recorder</b>          | as specified   | as per bid | y/n |
| 15.1  | speed                       | ≥2X  |            |     |
| 15.2  | media                       | CD-R and CD-RW   |            |     |
| 15.3  | interface                   | EPP / ECP, bi-directional                              |            |     |
| 15.4  | housing                     | external, portable                                     |            |     |
| 15.5  | power supply<br>(in office) | 220 VAC ±25%;<br>47 to 53 Hz                           |            |     |
| 15.6  | (on board)                  | 11 to 18 VDC or wider                                  |            |     |
| 15.7  | operating temperature       | 10 to 45°C   |            |     |
| 15.8  | humidity                    | 10 to 80%  |            |     |
|       |                             |  |            |     |
| 16.0  | <b>Plotter/printer</b>      | as specified   | as per bid | y/n |
|       | <b>general</b>              |  |            |     |
| 16.1  | paper sizes                 | A4 to A3   |            |     |
| 16.2  | absolute accuracy           | ≤0.25 mm of any point                                  |            |     |
| 16.3  | resolution                  | ≥300 dpi colour  |            |     |
| 16.4  |                             | ≥600 dpi monochrome                                    |            |     |
| 16.5  | plotting method             | raster (pen type is not<br>effective for colour fills) |            |     |
|       |                             |  |            |     |
|       | <b>data formats</b>         |  |            |     |
| 16.6  | vector                      | HPGL (1 and 2), BGL, VDF                               |            |     |
| 16.7  | raster                      | HPRTL, TIFF 5.0  |            |     |
| 16.8  | other                       | Postscript   |            |     |
|       |                             |  |            |     |
|       | <b>auxiliary</b>            |  |            |     |
| 16.9  | interfaces                  | -LAN or<br>-EPP / ECP, bi-directional                  |            |     |
|       | serial                      | RS232; ≥9600 baud                                      |            |     |
| 16.10 | memory                      | ≥16 MB, expandable to 64<br>MB                         |            |     |
| 16.11 | power supply                | 220 VAC ±25%; 47 to 53 Hz                              |            |     |
| 16.12 | operating temperature       | 10 to 45°C   |            |     |
| 16.13 | humidity                    | 10 to 80%  |            |     |
|       |                             |  |            |     |

| 17.0  | <b>Printers</b>       | as specified  | as per bid | y/n |
|-------|-----------------------|---|------------|-----|
|       | <b>laser printer</b>  |   |            |     |
| 17.1  | printing speed        | ≥12 ppm   |            |     |
| 17.2  | printing resolution   | ≥600 * 600 dpi  |            |     |
| 17.3  | buffer capacity       | ≥4 Mbytes, expendable to 8 Mbytes                     |            |     |
| 17.4  | printer language      | MS-Windows compatible, enhanced PCL 5                 |            |     |
| 17.5  | fonts                 | ≥20, and scaleable fonts                              |            |     |
| 17.6  | interfaces            | -LAN or<br>-EPP / ECP, bi-directional                 |            |     |
| 17.7  | serial                | RS232; ≥9600 baud                                     |            |     |
| 17.8  | interface             | -LAN<br>-EPP / ECP, bi-directional or<br>RS232; ≥baud |            |     |
| 17.9  | paper size            | A4, letter, executive                                 |            |     |
| 17.10 | paper tray capacity   | ≥100 sheets   |            |     |
| 17.11 | paper types           | plain paper, envelopes, and transparencies            |            |     |
|       |                       |   |            |     |
| 17.12 | power supply          | 220 VAC ±25%; 47 to 53 Hz                             |            |     |
| 17.13 | operating temperature | 10 to 45°C  |            |     |
| 17.14 | humidity              | 10 to 80%   |            |     |
|       |                       |   |            |     |
|       | <b>inkjet printer</b> |   |            |     |
| 17.15 | printing speed        | black ≥3 ppm (A4),<br>colour ≥1.5 ppm (A4)            |            |     |
| 17.16 | printing resolution   | B/W ≥600 * 600 dpi<br>colour ≥300 * 300 dpi           |            |     |
| 17.17 | printer language      | MS-Windows compatible                                 |            |     |
| 17.18 | fonts                 | ≥20 graphics, and scaleable                           |            |     |
| 17.19 | interface             | parallel  |            |     |
| 17.20 | paper size            | A4, A3, letter, executive                             |            |     |
| 17.21 | paper tray capacity   | 100 sheets plain paper                                |            |     |
| 17.22 | paper types           | plain paper, envelopes and<br>transparencies          |            |     |
| 17.23 | power supply          | 220 VAC ±25%; 47 to 53 Hz                             |            |     |
| 17.24 | operating temperature | 10 to 45°C  |            |     |
| 17.25 | humidity              | 10 to 80%   |            |     |



## **Section VIII – A**

- **(Referred to in Clause 12.3 (d) of ITB)**

## **Qualification criteria**

## **I INTEGRATED BATHYMETRIC SYSTEMS**

1. The bidder shall be a manufacturer/ authorized agent of the manufacturer of the various components of the systems who must have been in similar business during the last three years and must have designed, manufactured, tested and supplied similar equipment/software.
2. The bidder shall furnish the information on all past supplies and satisfactory performance over the last three years in other projects in proforma under Form 11, Section VII.
3. All the bids submitted shall also include reports on the financial standing of the bidder – the annual turnover in any one of the last three years shall not be less than Rs. 130 million (US\$ 3 million approx.).
4. The bidder or his authorized representative must have at least one office in each state of the consignee, maintained by a qualified technician and shall have sufficient stock of inventory of spares for repair and maintenance. The bidder shall be in a position to attend any necessary maintenance/ repairs within 7 days from the date of receipt of the complaint ( Give details in Section – VII , Form – 8)

## **II SURVEY BOAT AND ACCESSORIES**

1. The bidder must be a manufacturer/authorized agent of the manufacturer of Hydrographic Survey Boat/Boat Trailer and supplier of Hydrographic Survey Boat / Boat Trailer.
2. The bidder shall have been in the business of manufacturing and/or sale of Hydrographic Survey Boat/Boat Trailer for a minimum period of 5 years and have a license/exercise registration for manufacturing and/or sale of Hydrographic Survey Boat / Boat Trailer.
3. The Bidder shall furnish details of the number of Hydrographic Survey Boat/ Boat Trailer manufactured and/or sold during the last three years in Form 11 of Section VII.
4. The Bidder shall produce documents of evidence in support of points of satisfactory working condition of boats/boat trailers supplied for a minimum period of three years as on the date of bidding. Such certification should be from an officer of the rank (i) not less than Executive Engineer or equivalent post in case of Govt. Office and (ii) not less than that of a Managing Director in case of a Private Company.
5. The bidder shall furnish the data to support that he has the financial and production capacity to perform the contract and complete the supplies within the stipulated delivery period.

6. The bidder or his authorized representative must have at least one office in each state of the consignee maintained by a qualified technician and shall have sufficient stock of inventory of spares for repair and maintenance. The bidder shall be in a position to attend necessary maintenance/repairs within 7 days from the date of receipt of the complaint (Give details in Section – VII, Form – 8).

### **III AUXILIARY EQUIPMENT**

1. The bidder shall be a manufacturer/authorized representative of a manufacturer who must have designed, manufactured, tested and supplied the equipment(s) similar to the type specified in the “schedule of requirements” upto at least 50% of the quantity required in any one of the last 3 years. Such equipment must be of the most recent series models incorporating the latest improvements in design. The models should have been released on or after July 1998 (indicate year of models as appropriate) and be in successful operation for about six months as on date of bid opening.
2. The bidder shall furnish the information on all past supplies and satisfactory performance in proforma under Form 11, Section VII.
3. The bidder or his authorized representative must have at least one office in each state of the consignee maintained by a qualified technician and shall have sufficient stock of inventory of spares for repair and maintenance. The bidder shall be in a position to attend necessary maintenance/repairs within 7 days from the date of receipt of the complaint (Give details in Section – VII, Form – 8)

### **IV GENERAL**

All bids submitted shall also include the following information:

- i) Copies of original documents defining the constitution or legal status, place or registration and principle place of business of the company or firm or partnership, etc.
- ii) The bidder should furnish a brief write up, backed with adequate data, explaining his available capacity and experience (both technical and commercial) for the manufacture and supply of the required systems and equipment within the specified time of completion after meeting all their current commitments.
- iii) The bidder should clearly confirm that all the facilities exist in his factory for inspection and testing and these will be made available to the Purchaser or his representative for inspection.
- iv) Details of Service Centers and information on service support facilities that would be provided after the warranty period.
- v) Reports on financial standing of the Bidder such as profit and loss statements, balance sheets and auditor’s report of the past three years, bankers certificates, etc;

## **Section IX**

# **Eligibility for the Provision of Products and Services in Bank-Financed Procurement**

## Public Information Center

### As of January 1995

For the information of borrowers and bidders, and with reference to paragraph 1.6, footnote 9, of *Guidelines: Procurement under IBRD Loans and IDA Credits*, dated January 1995, set forth below is a list of countries from which bidders, products, and services are not eligible to participate in procurement financed by the bank or IDA.

- Andorra
- Cuba
- Democratic People's Republic of Korea (North Korea)
- Liechtenstein
- Monaco
- Nauro
- San Marino
- Tuvalu

In addition, bidders, products, and services from other countries or territories may be declared ineligible by provision in the Bidding Documents if the borrower's country has excluded them by law, official regulation, or act of compliance meeting the requirements of paragraph 1.8(a) of *Guidelines: Procurement under IBRD Loans and IDA Credits*.

**PRICE SCHEDULE - I FOR DOMESTIC GOODS OR GOODS OF FOREIGN ORIGIN LOCATED WITHIN INDIA  
(For Group A and Group B Bids)**

| 1<br>Schedule No. | 2<br>Item Description  | 3<br>Country of Origin | 4<br>Quantity & Unit | 5<br>Price of Each Unit                             |                      |   |  | 6<br>Unit Price | 7<br>Total Price per schedule for delivery at final destination | 8<br>Sales and other taxes payable if contract is awarded | 9<br>Labour, raw material and components from with in India included in the costs as % of ex-factory works price in column 5(a) |
|-------------------|--|------------------------|----------------------|---|----------------------|---|--|-----------------|---|---|---|
|                   |  |                        |                      | Ex-factory, Ex-warehouse, ex-showroom Off the shelf | Packing & forwarding | Inland transportation, insurance & other local costs incidental to delivery | Incidental Services listed in SCC Clauses 8 except for AMC which should be quoted separately |                 |   |   |   |
|                   |  |                        |                      | (a)   | (b)                  | (c)   | (d)  | a+b+c+d         | 4x6   |   |   |
|                   | <p><b>A. Supply of goods/equipment</b></p> <p>a. Main equipment comprising of the following goods/equipments</p> <ol style="list-style-type: none"> <li>1. Hydrographic Echosounder (one no.)</li> <li>2. Sound Velocity Calibrator (one no.)</li> <li>3. Differential Global Positioning System comprising of reference station aand digital radio link (one unit)</li> <li>4. Data Acquisition Computer (two nos.)</li> <li>5. Bathymetry Software (three nos.)</li> <li>6. FRP boat with two outboard engines, a boat trailer and voice radio (one unit)</li> </ol> |                        | 2 (two) sets         |   |                      |   |  |                 |   |   |   |

**PRICE SCHEDULE - I FOR DOMESTIC GOODS OR GOODS OF FOREIGN ORIGIN LOCATED WITHIN INDIA  
(For Group A and Group B Bids)**

| 1  | 2  | 3                 | 4               | 5  |                      |   |  | 6          | 7  | 8  | 9  |
|--|--|-------------------|-----------------|--|----------------------|---|--|------------|--|--|--|
|  |  |                   |                 | Price of Each Unit                                     |                      |   |  |            |  |  |  |
| Schedule No.   | Item Description   | Country of Origin | Quantity & Unit | Ex-factory, Ex-warehouse, ex-showroom<br>Off the shelf | Packing & forwarding | Inland transportation, insurance & other local costs incidental to delivery | Incidental Services listed in SCC Clauses 8 except for AMC which should be quoted separately | Unit Price | Total Price per schedule for delivery at final destination | Sales and other taxes payable if contract is awarded | Labour, raw material and components from with in India included in the costs as % of ex-factory works price in column 5(a) |
|  |  |                   |                 | (a)  | (b)                  | (c)   | (d)  | a+b+c+d    | 4x6  |  |  |
|  | b. Auxiliary Equipment comprising of the following goods/ equipment<br><br>1. Battery Charger (two nos.)<br>2. Generator (two nos.)<br>3. Un-interruptible Power Supply (one no.)<br>4. Personal Computer (two nos.)<br>5. CD Recorder (one no.)<br>6. Plotter (one no.)<br>7. Printer (one no.) |                   | 2 (two) sets    |  |                      |   |  |            |  |  |  |
| Note:<br>a) In case of discrepancy between unit price and total price, the unit price shall prevail.<br>b) For column 9, break-up of the cost of labour, raw materials and components provided from within India should also be indicated separately as specified in Clause 27.1 of Instructions to Bidders.<br>c) Charges for annual maintenance for 3 years after warranty should be quoted separately in the annexed price schedule - III |  |                   |                 | <b>Total Price of Goods and Equipment</b>              |                      |   |  |            |  |  |  |

**PRICE SCHEDULE - I FOR DOMESTIC GOODS OR GOODS OF FOREIGN ORIGIN LOCATED WITHIN INDIA  
(For Group A and Group B Bids)**

| 1  | 2  | 3                 | 4               | 5  |                      |   |   | 6          | 7     | 8  | 9   |
|--|--|-------------------|-----------------|--|----------------------|---|---|------------|-------|--|---|
|  |  |                   |                 | Price of Each Unit   |                      |   |   |            |       |  |   |
| Schedule No.   | Item Description   | Country of Origin | Quantity & Unit | Ex-factory, Ex-warehouse, ex-showroom Off the shelf  | Packing & forwarding | Inland transportation, insurance & other local costs incidental to delivery | Incidental Services listed in SCC Clauses 8 | Unit Price | Price | Sales and other taxes payable if contract is awarded | Labour, raw material and components from within India included in the costs as % of ex-works price in column 5(a) |
|  |  |                   |                 | (a)  | (b)                  | (c)   | (d)   | b+c+d      | 4x6   |  |   |
|  | <b>B. Installation and commissioning services</b><br>Installation, test, integration of systems, including training for 108 (one hundred eight) mandays for each system. |                   | 2 systems       |  |                      |   |   |            |       |  |   |
| Note:<br>a) In case of discrepancy between unit price and total price, the unit price shall prevail.<br>b) For column 9, break-up of the cost of labour, raw materials and components provided from within India should also be indicated separately as specified in Clause 27.1 of Instructions to Bidders.<br>c) Charges for annual maintenance for 3 years after warranty should be quoted separately in the annexed price schedule - III |  |                   |                 | Total Bid Price of Schedule - I _____<br>Currency _____<br>In Figures _____<br>In Words _____<br>Signature of Bidder _____<br>Name _____<br>Business Address _____ |                      |   |   |            |       |  |   |

Place: \_\_\_\_\_

Date: \_\_\_\_\_



**PRICE SCHEDULE - II FOR GOODS TO BE IMPORTED FROM ABROAD  
(For Group C Bids)**

| 1            | 2   | 3                 | 4               | 5                   |                      |   |  | 6          | 7           | 8                  | 9  | 10                         |
|--------------|---|-------------------|-----------------|---------------------|----------------------|---|--|------------|-------------|--------------------|--|----------------------------|
|              |   |                   |                 | Price of Each Unit  |                      |   |  |            |             |                    |  |                            |
| Schedule No. | Item Description  | Country of Origin | Quantity & Unit | FOB Port of Loading | CIF at Port of Entry | Inland transportation, insurance & other local costs incidental to delivery | Incidental Services Listed in SCC clause 8 except for Annual Maintenance Charges which should be Quoted separately | Unit Price | Total Price | Indian agents name | Indian agents commission as a% of FOB price included in quoted price | Shipment weight and volume |
|              |   |                   |                 | (a)                 | (b)                  | (c)   | (d)  |            | a+b+c+d     | 4*6                |  |                            |
|              | <b>A. Supply of goods/equipment</b><br><br>a. Main equipment comprising of the following goods/equipments<br><br>1. Hydrographic Echosounder (one no.)<br>2. Sound Velocity Calibrator (one no.)<br>3. Differential Global Positioning System comprising of reference station and digital radio link (one unit)<br>4. Data Acquisition Computer (two nos.)<br>5. Bathymetry Software (three nos.)<br>6. FRP boat with two outboard engines, a boat trailer and voice radio (one unit) |                   | 2 (two) sets    |                     |                      |   |  |            |             |                    |  |                            |

**PRICE SCHEDULE - II FOR GOODS TO BE IMPORTED FROM ABROAD  
(For Group C Bids)**

| 1  | 2  | 3                 | 4               | 5  |                      |   |  | 6          | 7           | 8                  | 9  | 10                         |
|--|--|-------------------|-----------------|--|----------------------|---|--|------------|-------------|--------------------|--|----------------------------|
|  |  |                   |                 | Price of Each Unit                         |                      |   |  |            |             |                    |  |                            |
| Schedule No.   | Item Description   | Country of Origin | Quantity & Unit | FOB Port of Loading                        | CIF at Port of Entry | Inland transportation, insurance & other local costs incidental to delivery | Incidental Services Listed in SCC clause 8 except for Annual Maintenance Charges which should be Quoted separately | Unit Price | Total Price | Indian agents name | Indian agents commission as a% of FOB price included in quoted price | Shipment weight and volume |
|  |  |                   |                 | (a)  | (b)                  | (c)   | (d)  |            | a+b+c+d     | 4*6                |  |                            |
|  | b. Auxiliary Equipment comprising of the following goods/ equipment<br><br>1. Battery Charger (two nos.)<br>2. Generator (two nos.)<br>3. Un-interruptible Power Supply (one no.)<br>4. Personal Computer (two nos.)<br>5. CD Recorder (one no.)<br>6. Plotter (one no.)<br>7. Printer (one no.) |                   | 2 (two) sets    |  |                      |   |  |            |             |                    |  |                            |
| Note:<br>a) Incase of discrepancy between unit price and total price, the unit price shall prevail.<br><br>b) For coloumn 9, break-up of the cost of labour, raw materials and components provided from within India should also be indicated separately as specified in Clause 27.1 of Instructions to Bidders.<br><br>c) Charges for annual maintenance for 3 years after warranty should be quoted separately in the annexed price schedule - III |  |                   |                 | <b>Total Price for goods and Equipment</b> |                      |   |  |            |             |                    |  |                            |

**PRICE SCHEDULE - II FOR GOODS TO BE IMPORTED FROM ABROAD  
(For Group C Bids)**

| 1  | 2   | 3                 | 4               | 5   |                      |   |  | 6          | 7           | 8                  | 9  | 10                         |
|--|---|-------------------|-----------------|---|----------------------|---|--|------------|-------------|--------------------|--|----------------------------|
|  |   |                   |                 | Price of Each Unit  |                      |   |  |            |             |                    |  |                            |
| Schedule No.   | Item Description  | Country of Origin | Quantity & Unit | FOB Port of Loading   | CIF at Port of Entry | Inland transportation, insurance & other local costs incidental to delivery | Incidental Services Listed in SCC clause 8 except for Annual Maintenance Charges which should be Quoted separately | Unit Price | Total Price | Indian agents name | Indian agents commission as a% of FOB price included in quoted price | Shipment weight and volume |
|  |   |                   |                 | (a)   | (b)                  | (c)   | (d)  |            | a+b+c+d     | 4*6                |  |                            |
|  | <b>B. Installation and commissioning services</b><br>1. Installation, test, integration of systems, including training for 108 (one hundred eight) mandays for each system. |                   | 2 (two) sets    |   |                      |   |  |            |             |                    |  |                            |
| Note:<br>a) In case of discrepancy between unit price and total price, the unit price shall prevail.<br>b) For column 9, break-up of the cost of labour, raw materials and components provided from within India should also be indicated separately as specified in Clause 27.1 of Instructions to Bidders.<br>c) Charges for annual maintenance for 3 years after warranty should be quoted separately in the annexed price schedule - III |   |                   |                 | Total Bid Price of Schedule - II _____<br>Currency _____<br>In Figures _____<br>In Words _____<br>Signature of Bidder _____<br>Name _____<br>Business Address _____ |                      |   |  |            |             |                    |  |                            |

Place: \_\_\_\_\_

Date: \_\_\_\_\_

**PRICE SCHEDULE - III FOR ANNUAL MAINTENANCE AND REPAIR CHARGES  
AFTER WARRANTY PERIOD**

**(Common to bids of all Groups)**

| Component Description   | Qty.         | Post-Warranty period<br>(Clauses 8 & 10 of SCC) |                  |                 |                  |                 |                  | Total Price     |                  |
|---|--------------|---|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|
|   |              | Year 1  |                  | Year 2          |                  | Year 3          |                  | Indian Currency | Foreign Currency |
|   |              | Indian Currency                                 | Foreign Currency | Indian Currency | Foreign Currency | Indian Currency | Foreign Currency |                 |                  |
| Boat mounted integrated Bathymetry System including Auxiliary Equipment | 2 (two) sets |   |                  |                 |                  |                 |                  |                 |                  |

Note: In case of discrepancy between unit price and total price, the unit price shall prevail.

Place: \_\_\_\_\_

Date: \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

Name \_\_\_\_\_

Business Address \_\_\_\_\_

**BID PRICE SUMMARY FORM**

Name of Bidder \_\_\_\_\_ IFB NO. \_\_\_\_\_ PAGE \_\_\_\_\_ OF \_\_\_\_\_

|  | Foreign Currency #1 |          | Foreign Currency #2 |          | Foreign Currency #3 |          | Local<br>Currency |
|--|---------------------|----------|---------------------|----------|---------------------|----------|-------------------|
|  | Amount              | Currency | Amount              | Currency | Amount              | Currency | Amount            |
| Schedule – I   |                     |          |                     |          |                     |          |                   |
| Schedule – II  |                     |          |                     |          |                     |          |                   |
| Schedule – III   |                     |          |                     |          |                     |          |                   |
| <b>Total Bid Price</b><br><b>(To Grand Summary of Bid Price)</b> |                     |          |                     |          |                     |          |                   |

Note: Bidders should complete the table by extracting the cost totals, in different currencies applicable, from the relevant Price Schedules.

Place: \_\_\_\_\_

Date: \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

Name \_\_\_\_\_

Business Address \_\_\_\_\_

**Maintenance Service Details for Warranty Period and Post Warranty Period**

| A      | B                | C  |   | D  |   |
|--------|------------------|--|---|--|---|
| S. No. | Item Description | Warranty Period                                |   | Post-warranty Period                           |   |
|        |                  | Organization responsible for front-end support | Organization responsible for back-end support | Organization responsible for front-end support | Organization responsible for back-end support |
|        |                  |  |   |  |   |
|        |                  |  |   |  |   |
|        |                  |  |   |  |   |
|        |                  |  |   |  |   |
|        |                  |  |   |  |   |
|        |                  |  |   |  |   |
|        |                  |  |   |  |   |
|        |                  |  |   |  |   |

**Note: Please provide complete list of Offices, Numbers of technical and support staff for all organizations mentioned above in the format:**

Place: \_\_\_\_\_

Date: \_\_\_\_\_

Signature of Bidder \_\_\_\_\_

Name \_\_\_\_\_

Business Address \_\_\_\_\_

**B. Installation and commissioning services**

Installation, test, integration of systems, including training for 108 (one hundred eight) mandays.

1 (one) system

**B. Installation and commissioning services**

Installation, test, integration of systems, including training for 108 (one hundred eight) mandays.

1 (one) system

**B. Installation and commissioning services**

Installation, test, integration of systems, including training for 108 (one hundred eight) mandays.

1 (one) system

**B. Installation and commissioning services**

Installation, test, integration of systems, including training for 108 (one hundred eight) mandays.

1 (one) system

**B. Installation and commissioning services**

Installation, test, integration of systems, including training for 108 (one hundred eight) mandays.

1 (one) system

**B. Installation and commissioning services**

Installation, test, integration of systems, including training for 108 (one hundred eight) mandays for each system.

2 (two) system

**B. Installation and commissioning services**

Installation, test, integration of systems, including training for 108 (one hundred eight) mandays for each system.

2 (two) system



Part III: List of Consignees' address, Telephone/fax number

| S. No. | Name and Address of Consignee   | No. of set of Bathymetry Survey Equipments | Telephone No.             | Fax No.     |
|--------|---|--|---------------------------|-------------|
| 01.    | Deputy Director<br>Data Archieving & Publishing<br>Unit – 8, Delta Colony<br>Bhubaneshwar – 751012<br>Orissa        | One  |                           |             |
| 02.    | Joint Director<br>APERL, Himayat Sagar<br>Hyderabad – 500 030<br>Andhra Pradesh                                     | Two  | 040 – 4015071<br>/4015052 |             |
| 03.    | Chief Research Officer<br>Hydraulics Division<br>KERS, K.R. Sagar – 571607<br>Karnataka                             | One  | 08236-57253               | 0821-402672 |
| 04     | Research Officer<br>Hydro Dynamic Division No. II<br>MERI, Nashik – 422 004<br>Maharashtra                          | One  |                           |             |
| 05.    | Joint Director<br>Hydraulics, KERI, PEECHI,<br>Thrissure District<br>Kerala   | One  | 0487-782013               |             |
| 06.    | Mr. D.B. Jadav<br>Executive Engineer<br>WRI Divn. No. 1, Bhadra Fort<br>Lal Darwaza, Ahmedabad – 380 013<br>Gujarat | Two  | 079-5507098               | 079-5507019 |

| <b>S. No.</b> | <b>Name and Address of Consignee</b>   | <b>No. of set of Bathymetry Survey Equipments</b> | <b>Telephone No.</b>      | <b>Fax No.</b> |
|---------------|--|---|---------------------------|----------------|
| 07.           | The Executive Engineer<br>WRO, PWD<br>Watershed Management Board Division<br>(WSMB Division)<br>PAP Colony, M. K. Patti, Pollachi – 3,<br>Tamil Nadu | One   |                           |                |
| 08.           | Deputy Director<br>Hydrometeorology Division No. – 4<br>Water Resources Dept.<br>Shankar Nagar<br>Raipur – 492 001<br>Madhya Pradesh                 | One   | 0771-426019               |                |
| 09.           | Senior Research Officer<br>Procurement & Services<br>CWPRS, Khadakwasla P.O<br>Pune 411 024<br>Maharashtra   | One   | 0212-592511<br>Extn. 3372 | 0212-592004    |

## RESERVOIR SEDIMENTATION SURVEY

### COST OF EQUIPMENT

|                                    |        |         |
|------------------------------------|--------|---------|
| Echo Sounder & Velocity Calibrator | 1 no.  | 10 lacs |
| GPS                                | 1 nos. | 18 lacs |
| Laptop                             | 2 nos. | 2 lacs  |
| Software with 3 copies             |        | 10 lacs |
| Survey Boat and 2 Engines          |        | 12 lacs |
| Trailer                            | 1 no.  | 1 lac   |
| Voice Radio                        | 1 set  | 1 lac   |
| Battery Charger                    | 2 nos. | 0.5 lac |
| Generator                          | 2 nos. | 1 lac   |
| UPS                                | 1 no.  | 0.5 lac |
| PC                                 | 2 nos. | 1.5 lac |
| CD Recorder                        | 1 no.  | 0.5 lac |
| Plotter                            | 1 no.  | 0.5 lac |
| Printer                            | 1 no.  | 0.5 lac |
|                                    |        | -----   |
|                                    |        | 59 lacs |
|                                    |        | =====   |

Insert a new clause 24.5 as below:

‘the Technical Responsiveness of the bids would be given determined as per details given in Section VII-B. Only Technically Responsive bids would be considered for further evaluation’.

Replace the existing clause 24.5 as 24.6.

Insert a new clause 24.5 as below:

‘the Technical Responsiveness of the bids would be given determined as per details given in Section VII-B. Only Technically Responsive bids would be considered for further evaluation’.

Replace the existing clause 24.5 as 24.6.

Insert a new clause 24.5 as below:

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Replace the existing clause 24.5 as 24.6.