

TENDER DOCUMENT for

**Marine Multichannel and Ocean Bottom Seismic Data
Acquisition for Imaging the Andaman Subduction Zone**

No.57(55)2016-Pur/T-117 dated December 14, 2016



CSIR-NATIONAL GEOPHYSICAL RESEARCH INSTITUTE

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CSIR-National Geophysical Research Institute (NGRI), invites Global Tenders **under Two Bid system Part-I (Technical Bid) and Part-II (Commercial Bid)** from reputed Service providers with sound technical and financial capabilities who can undertake **Marine Multichannel and Ocean Bottom Seismic Data Acquisition for Imaging the Andaman Subduction zone.**

1. The last date & time for submission of Tenders is: **26/12/2016 – 11.30 a.m. (IST)**
2. The Tenders (Part – I) will be opened on: **26/12/2016 – 2.30 p.m. (IST)**
3. Tender forms are not being sold separately and the same to be downloaded from our Website: www.ngri.org.in
4. The Director, CSIR-NGRI reserves the right to reject any or all tenders without assigning any reason thereof.
5. In case of any modifications in specifications / terms and conditions / any clarifications to the bid document, it will be hosted in our website only and bidders are requested to log onto our website www.ngri.org.in from time to time and no separate corrigendum will be issued in this regard.

This Document consists of pages 1 to 68 (with this page as no. 2)

SECTION 1

INTRODUCTION SCOPE OF SERVICES

1.1 CSIR-National Geophysical Research Institute referred (NGRI), invites tenders for consideration of awarding the work of marine geophysical surveys in parts of the Andaman-Nicobar offshore region. The data to be acquired by these surveys are designed to support India's research programs pertaining to imaging the Andaman-Nicobar subduction zone.

1.2 The primary goals of the surveys are the precise identification and depth determination of the active subduction phenomenon in the Andaman region.

1.3 The long-offset seismic reflection, wide-angle seismic refraction data and marine gravity and magnetic data along with bathymetry are to be collected along a 400 km-long seismic line at water depths between 25 and 5000 m.

1.4 The proposed work consists of

- (i) Acquisition of large-offset multi-channel seismic reflection data, refraction/wide-angle reflection data by deploying 4-component Ocean Bottom Seismometers (OBS) [1 Hydrophone & 3 Geophones] and Gravity and Magnetic (G&M) data along the proposed seismic line.
- (ii) Quality Check of Geophysical data & Onboard seismic data processing
- (iii) Pre-Stack depth migration of MCS data and Traveltime tomography (first break and multi-layered) of OBS data, to be carried out at CSIR-NGRI
- (iv) Preliminary Interpretation & Documentation of data sets, to be done at CSIR-NGRI

The streamer length for multi-channel seismic (MCS) data acquisition should be 12 km, airgun array of 10,000-12,000 cu-in with a minimum pressure of 2000psi, source interval 100m for the MCS and OBS survey, receiver interval is 25 m for MCS survey; 5.0-10 km OBS interval for wide-angle seismic survey. Same source would be utilized for both MCS and OBS surveys. The service provider has to submit the modeling results for various source receiver configurations, with source depth varying between 6-8m and receiver depth varying between 8-10m, so that there is (i) highest peak to peak ratio, (ii) minimum peak to bubble pulse ratio and (iii) absence of notch in the source spectrum which contains frequencies between 5-125Hz. Record length for MCS is 20s and for OBS survey is 40s. Sampling interval is 2 ms for MCS data, and 4 ms for OBS data. Gravity and magnetic data to be collected at an accuracy of 0.1nT and 0.01mGal respectively.

1.5 Based on onboard evaluation of the data generated, CSIR-NGRI may vary the coordinates and length of the line supplied to the Contractor, to better serve the purposes. Such variations may result in relocation of all or part of a survey line and/or its extension or curtailment. However, even with such variations, the total length will be 400 km of bathymetry, MCS, OBS, G/M, with 150km offset shooting from both ends of the line.

1.6 The locations and the number of OBS to be deployed shall be informed to the service provider 15 days prior to the commencement of survey, but the total number of OBS to be made available onboard should be 75.

1.7 **The successful bidder must ensure that the personnel and equipment are ready to commence the survey in the area by 01/03/2017.** Details about the background of the personnel and of the equipment should be made available to CSIR-NGRI. A written undertaking to this effect will be required before signing the Agreement.

1.8 **Bidders must undertake to complete all aspects of the surveys** including data acquisition, onboard processing, special processing, documentation and making available to CSIR-NGRI all the deliverables as detailed at **Annexure F** of this Tender Document to the best satisfaction of CSIR-NGRI **by 20/03/2017.**

INVITATION FOR TENDER

1.9 CSIR-NGRI invites tenders for the provision of the above-mentioned services. Tenders complete in all respects and complying with all the requirements set out in this Tender Document should be sent in the format specified in this Tender Document to the following address:

The Director,
Attn.: Controller of Stores & Purchase,
CSIR-NGRI (Room No.43)
Uppal Road,
Hyderabad - 500 007,
Telangana, India.

Tel: +91-040 2701 2887 / 2701 2370 Fax: +91-040-2717 1564
e-mail: purchase@ngri.res.in

Tenders should be received by **11.30 a.m.** Indian Standard Time (IST) on **26/12/2016.**

1.10 The Technical bids (Part-I) shall be opened on **26/12/2016 – 2.30 p.m.** (IST) in the office of the CSIR-NGRI, Hyderabad, in the presence of the bidders or their authorized representative(s), if any. No formal invitation shall be extended to the bidders for this purpose. The Technical bids shall be opened first.

1.11 CSIR-NGRI reserves the right to vary the specifications provided in this tender document or to award the whole of the required services to one bidder or not to make any award for any or for all of the services, following this invitation to tender

1.12 CSIR-NGRI reserves the right to reject any or all of the bids received in response to this invitation to tender without assigning any reasons whatsoever.

1.13 CSIR-NGRI reserves the right to vary the specifications mentioned in tender document for air gun type, source, frequency band etc. after evaluating the bid documents to award the contract.

1.14 CSIR-NGRI reserves the right to award the contract for alone or together based on the bidder's technical capability to complete the assignment as envisaged.

SECTION 2 INSTRUCTIONS TO BIDDERS

2.1 This Tender Document is to be read along with the Notice Inviting Tender issued by CSIR-NGRI.

2.2 CSIR-NGRI reserves the right to reject any or all of the bids received in response to this invitation to Tender without assigning any reasons whatsoever.

2.3 Bidders should have sufficient technical expertise for carrying out marine multi-channel seismic and Ocean Bottom Seismic data acquisition and processing, financial resources, and successful previous experience **(provide detailed information) of at least five years** of executing such surveys for which they are bidding.

2.4 CSIR-NGRI will not take cognizance of any internal arrangements as may be made by the bidder for the satisfactory completion of the work as per the terms and conditions laid down in this document. The successful bidder will be directly responsible for proper completion of the work.

2.5 The Tender shall be prepared at the cost of bidder. CSIR-NGRI will not be responsible for any costs or expenses incurred by any bidder in connection with the preparation and delivery of his Tender or for any other expenses incurred in connection with such bidding.

2.6 Full illustrative literature, details of previous experience, details about personnel, record of work, agreements entered into with various companies, etc. should be attached separately with the bid. Documentary proof related to the works carried out by the bidder in the field of imaging of deep earth structure in the last two years as on the date of tender opening to be provided.

2.7 The Technical specifications of the required work are described in **Section 5**. The bidders should note that the specifications provided are meant to be only a guideline in achieving the objectives of the survey.

2.8 The Bidder shall be deemed to have examined the Tender Document and to have satisfied himself, so far as may be reasonable for an experienced Contractor before submitting the Tender, as to the sufficiency and correctness of his Tender for the services being offered and of the prices quoted by him.

2.9 In formulating their Tender, bidders shall have full regard to the contents of the General Conditions of Agreement given in Section 4, since all bids will be deemed to have been made after taking into account all the provisions thereof.

2.10 The successful bidder will have to execute an Agreement as set out in **Section 4** within 7 days from the date of issue of a fax / letter of intent by CSIR-NGRI. The Agreement as finally accepted will include CSIR-NGRI's Tender Document and amendments if any, and the bidder's offer as finally accepted by CSIR-NGRI.

SUBMISSION OF PERFORMANCE BANK GUARANTEE

2.11 The successful bidder will have to submit within seven days of the effective date of the Agreement, Performance Guarantee to the extent of 10% of the Value of the contract.

Such guarantee shall be –

- (i) on demand
- (ii) from a reputed Bank (scheduled bank in India or foreign bank)
- (iii) Unconditional as per format in **Annexure C**
- (iv) valid for 60 days from the date of completion of the assigned work as shall be so declared by CSIR-NGRI, and
- (v) will be for the due performance of the Agreement by the Contractor, claimable by CSIR-NGRI only in the event of breach by the Contractor of any of its obligations under the Agreement.

2.12 Bidders shall note that CSIR-NGRI will not entertain any correspondence or queries on the status of the offers received against this Tender Invitation.

2.13 Canvassing in any form by any bidder or by any other agency acting on behalf of the bidder after submission of bid may disqualify the said bidder. CSIR-NGRI's decision in this regard shall be final and binding on the bidder.

2.14 CSIR-NGRI will not be liable for any obligation until such time the CSIR-NGRI has communicated to the successful bidder of its decision to entrust the tendered work.

2.15 Overseas bidders while submitting Tender should indicate as to whether they have engaged the services of an Agent in India and if so, the extent of services such an Agent has to perform and the payment for such services. The payment to be made to the Agent will be deducted by CSIR-NGRI from the payment of the successful overseas Bidders and paid to its Indian Agent in non-convertible Indian Rupees. Such details should be provided in the Price Bids. A qualified Indian cook with documentary evidence of at least two years experience should be arranged exclusively for the Indian participants.

Closing date

2.16 Bids should be received from the Tenderers at CSIR-NGRI by **11.30 a.m.** Indian Standard Time (IST) **on 26/12/2016**. Bids or modifications to the bids received after the closing dates and time shall not be considered.

2.17 CSIR-NGRI will not be responsible for the loss of the Tender or for any delay in postal transit.

INSTRUCTIONS FOR FILLING TENDERS

General

2.19 The Tender papers shall be filled-in, complete in all respects and shall be submitted together with requisite information and Appendices, if any. It shall be complete and free from ambiguity, change or interlineations. Tender prices must not be indicated on any document other than the official form of price bid (**Annexure B(i)**). Any additional information related to costs of any services that the bidder wishes to submit must be attached as an addendum in the price bid only.

2.20 The Bidder's tender and any annotations or accompanying documentation shall be in English Language only. Supporting documents in any other language shall carry an English translation authenticated by an independent authority.

2.21 The bidder shall sign on each page of the Tender Document submitted by him.

2.22 Bidders should indicate at the time of quoting against this Tender their full postal and e-mail address, phone and fax number(s) and also similar information in respect of their authorized agents in India, if any.

BID VALIDITY

2.23 The Tender shall be kept valid for acceptance for a Bid has to be valid for 90 days from the date of opening of Part-I (Technical bid) and EMD has to be valid for 135 days from the date of opening of Part-I (Technical bid). If any bidder desires to offer a longer validity period, it should specifically be mentioned in the Tender. Offers with validity of acceptance for less than 90 days will not be considered.

2.24 The bidder shall sign the Tender with the exact name and address of the firm, which is bidding for the tendered work.

2.25 The Tender shall be signed by a duly authorized officer of the firm which is bidding for the tendered work, and in the case of a Corporation, seal, or otherwise appropriately executed under seal.

2.26 Bidders shall clearly indicate their legal constitution and furnish documentary evidence thereof by way of authenticated copies of relevant documents and the person signing the Tender shall state his capacity and also the source of his authority to bind the bidder. The power of Attorney or authorization, or any other document constituting adequate proof of the authority of the signatory to bind the bidder, shall be annexed to the tender submitted. CSIR-NGRI may reject outright any tender unsupported by adequate proof of the signatory's authority.

2.27 Where the Tender is made by a Consortium, the Tender shall specifically indicate the members of the consortium by whom and/or on whose behalf the Tender is being made and shall indicate with reference to each whether such member contributes directly to the work or not and, if so, to what extent he contributes to the said work. In the event of a person/firm who is not a member of the said consortium, details of name and address of such

person/firm and shall be accompanied by valid proof of authority drawn in favor of Consortium to bind such person/firm.

In case of bids from a consortium, it should further comply with the following requirements:

- The bid shall be signed so as to be legally binding on all partners;
- The bid shall include a copy of the agreement entered into by the consortium partners defining the division of assignments to each partner and establishing that all partners shall be joints and severally liable for the execution of the Contract in accordance with the Contract terms.
- One of the partners shall be nominated as being in charges, authorized to incur liabilities, and receive instructions for and on behalf of any and all partners of the consortium and
- The execution of entire contract, including payment, shall be done exclusively with the partner in charge.
- The qualifications of each of the partners of a consortium shall be added together to determine the Bidder's compliance with the minimum qualifying criteria.
- Each bidder shall submit only one Bid, either individually or as a consortium. A bidder who submits or participates in more than one Bid will cause all the proposals with the Bidder's participation to be disqualified.
- In case of consortium, the past experience of each partner in the area of work for which they assume responsibility in this bid must be clearly stated with supporting documents.

BID SECURITY / EARNEST MONEY DEPOSIT (EMD):

Bidders are required to submit **EMD valid for 135 days** from the date of opening of Part-I Technical Bid for an amount of **Rs 24.00 lakhs (Rupees Twenty four lakhs Only) (or) USD 36,000 (USD Thirty six thousands only) or equivalent**

EMD can be in the form of a DD drawn in favour of The Director, NGRI, payable at Hyderabad (or) in the form of bank guarantee as per proforma attached (ANNEXURE H), from a Nationalised / Scheduled Bank.

The successful bidder is required to extend the validity of the EMD for a further period till the formal contract is signed and Performance Bank Guarantee (PBG) submitted.

Bids not accompanied by BID SECURITY / Earnest Money Deposit (EMD) as mentioned above will be summarily rejected.

The EMD of unsuccessful Bidders will be returned once the successful bidder furnishes the performance bank guarantee or in case the bid is cancelled.

The EMD shall be forfeited in the following events:

- a. If the Bid is withdrawn or modified or varied in a manner not acceptable to CSIR-NGRI, during the Bid Validity period or any extension thereof.

- b. If a successful Bidder fails to sign/fails to execute the contract.
- c. If fails to furnish Performance Bank Guarantee **within 21 days** of signing the contract.

Price Schedule.

2.28 Bidders shall set their price/quotations in firm and fixed figures and without qualifications. Each figure stated should also be repeated in words and in the event of discrepancy between the amount stated in figures and in words, the rates quoted in words shall be deemed to be the correct amount. **Tenders containing qualifying expressions such as “subject to availability”, “subject to minimum acceptance”, “no response” etc. or any conditional clauses invoked by the bidder shall be liable to disqualification and rejection.** If the space in the tender form or in the appendices thereto is insufficient, additional pages shall be separately added. These pages shall be consecutively numbered and shall also be signed by the bidder. **Any column left unfilled either in technical or commercial bid or both will disqualify the bidder from tendering process.**

2.29 Bidders shall be bound to keep the prices quoted in their Price Bids firm without any escalation for any reasons whatsoever until they complete the work assigned by CSIR-NGRI against this tender.

2.30 The prices shall be given in U.S. Dollars / equivalent or equivalent Indian Rupees only. The Indian bidders are free to quote firm price fully in Indian currency or in Indian currency for the indigenous portion and in US Dollars to the extent of imported components of the supplies to be effected. The quoted currency will not be allowed to be changed subsequent to the submission of the tender document.

2.31 The Bidders shall specify the percentage of the total agreement amount acceptable to them in non-convertible Indian Rupees from CSIR-NGRI.

2.32 The quoted prices shall include all costs related to the Vessel, its movement, crew, equipment, survey operation, manpower deployment, insurance, data acquisition, cost of recording media, consumables, on-board and post processing of acquired data, interpretation and the accommodation and victualling charges of personnel representing CSIR-NGRI onboard the vessel during the surveys.

2.33 All port calls, pilotage and harbor dues, cost of line and area changes and costs of change of work from reflection and refraction shall be borne by the bidder.

2.34 Mobilization and demobilization charges to be quoted by the bidder shall include all expenses related to the mobilization/ demobilization of the vessel, personnel and equipment to the survey site, including the time spent on the calibration/post-calibration of the onboard positioning system and equipment and other incidentals. This will also include all other costs for the survey not covered in other components of cost provided in **Annexure B(i)**. Payment to the Contractor shall be made in accordance with the Terms of Payment given in **Annexure E**, subject to the full satisfaction of CSIR-NGRI.

2.35 CSIR-NGRI will not pay any additional charges other than those provided for, in the Agreement. In particular, the following shall be to the account of the Contractor:

- (i) Any additional ship time spent because of equipment failure
- (ii) Ship failure during the survey operations
- (iii) Reshooting/resurveying as a result of inadequate quality control
- (iv) Reshooting/resurveying as a result of data loss on any recording media
- (v) Data retrieval from any backup media when the data is found to be unreadable on the primary recording media
- (vi) Overlap shooting for full fold after line is discontinued.
- (vii) Line change.

Insurance coverage

2.36 All insurance coverage is to be provided by the Contractor, as per details given in Clause 4.9. He shall furnish the required Certificate of Insurance prior to execution and exchange of formal agreement by the CSIR – NGRI.

INSTRUCTIONS FOR SUBMITTING TENDERS

2.37 The Technical specifications for the surveys are provided in **Section 5**.

2.38 The Technical and financial details for the tendered work shall be submitted by the bidder separately as follows:

2.39.1 The Technical bids shall be provided in one sealed envelope in the prescribed form (Annexure B(ii)), marked “**TECHNICAL BID**” with the Tender No.**57(55)2016-PUR/T-117**, date of closing of the Tender and the bidder’s Name and address. The envelope should contain one copy each of the Technical Bid (Part-I) and commercial Bid (PART-II), adequate information and documentation addressing the following in the same sequence, by way of illustration and not enumeration.

1. Complete and comprehensive details requested for, as per the format in **Annexure A**, including separate appendices, any technical literature, brochures etc. related to the vessel, its Class Certificate, the onboard equipment for navigation and data acquisition, copies of calibration certificates of all scientific instruments to be used for data acquisition and onboard processing, methodology for obtaining the data necessary to complete the tendered work and for onboard and post-processing including details of operational processes and procedure involved. All technical information should be supported by technical brochures/literature, documentary proof of survey capability, and copies of the relevant technical specifications of the equipment.
2. Contact details of the bidders including the complete mailing and e-mail address, phone and fax numbers, and the details of the authorized representative (s) of the bidder who would be submitting the bid on behalf of the bidder.

3. Résumés and details of key personnel who will be involved in providing the services tendered for, on behalf of the firm/ organization/ consortium and organizational track record for this type of work (see 2.43 below)
 4. Details of Indian Agents if any, their complete address, the extent of services the Agent will be performing on behalf of the bidder including the Power of Attorney/ letter of Authority setting out the agent's role in the bidding and subsequent services if the bidder becomes the Contractor. Details of any remuneration to be provided to the Agent should be indicated only in the price Bid.
 5. A tentative work program with time line including but not limited to: earliest date of mobilization in India, time required for completion of all the aspects of the survey quoted for, time required for onboard processing and post-processing, interpretation & documentation onshore, the duration of each port call, weather allowances, and probable date of demobilization.
 6. Outline of Vessel Operations Plan, identifying all operational aspects and risks associated with the vessel and equipment.
 7. Outline of the Risk management Plan, identifying all material risks that may impact the surveys, including data copying, security and integrity protocols.
 8. Outline of Health and Safety Plans.
 9. Outline of Environmental Impact Plan.
 10. Tender Submission form as at **Annexure G**, duly filled in and signed.
- 2.39.2 The Envelope Marked "**Technical Bid**" (Part-I) not containing any of the documents 1 to 10 under **Section 2, Clause 2.39.1** above is liable to be rejected.
- 2..39.3 The envelope marked "**Technical Bid**" (Part-I) shall contain only the above details along with the filled in form - Annexure **B(ii)** and NOT the prices nor any references to the pricing. In case an envelope marked as "**Technical Bid**" contains the charges for the surveys or any direct or indirect reference to the quoted prices, the offer by the bidder is liable to be rejected.
- 2.39.4 The **Price Bid** (Part-II) shall be submitted in accordance with the format in Annexure B (i) in **duplicate** in another sealed envelope marked "**Price Bid**" and with the Tender **No.57(55)2016-PUR/T-117** date of closing of the Tender and the bidder's Name and address.
- 2.39.5 Price Bids must be submitted, duly signed by the Authorized Representative as per the Proforma given in Annexure B (i) in the Envelope containing Price Bids only.
- 2.39.6 Not applicable..
- 2.39.7 The above said two sets of envelopes should be sealed in another envelope. This envelope should clearly be superscribed as "**CONFIDENTIAL**" and "**TENDER FOR**

MARINE GEOPHYSICAL SURVEYS”. This envelope should be addressed to The Director, Attn : Controller of Stores & Purchase, CSIR-National Geophysical Research Institute, Uppal Road, Hyderabad-500007, INDIA. **Tender reference No. No.57(55)2016-PUR/T-117** and closing date should also be written on the Envelope. Bidder desiring to effect hand delivery may arrange to drop Tenders sealed as described above into the Tender Box kept at the above office before the closing date and time.

2.39.8 Tender Documents **MUST** be submitted complete in all respects. Incomplete bids, or those not conforming to any of the instructions provided in this Tender Document, would be summarily rejected.

2.40 Technical / Financial capability, Qualifications / Experience of the Bidders

(a) Technical Capability:

- (i) Bidders must have a minimum of five (5) years experience of marine seismic data acquisition and
- (ii) must have executed agreements of similar nature and scope in the past two years as on the date of tender opening.
- (iii) The ship offered for data acquisition should have involved in related work in the last 5 years.

The ship offered for data acquisition may be inspected by a team, constituted by the Director, CSIR-NGRI.

- (iv) The bidder should provide a letter of having possession of 75 OBS.

(b) Financial Capability

The Bidder shall furnish documentary evidence that it meets the following financial requirement(s):

- (i). The bidder must provide a letter from a reputed bank stating the availability of liquid assets and / or credit facilities exclusively for this contract only, of not less than INR 12.00 Crores or equivalent.
- (or) An undertaking from a bidder stating that the availability of liquid assets and / or credit facilities exclusively for this contract only of not less than INR 12.00 Crores or equivalent.
- (ii). The minimum required annual turnover, Installation of bidder in any one of the last five (5) years shall be of INR 24.000 Crores or equivalent

Mobilization

2.41 The successful bidder must ensure that the personnel and equipment are ready to commence the survey by **01/03/2017**. A written undertaking to this effect will be required before signing the Service Agreement.

Completion time

2.42 Bidders must undertake to complete all aspects of the surveys including data acquisition, onboard processing, special-processing, interpretation, documentation and making available to CSIR-NGRI all deliverables as detailed at **Annexure F** and to the best satisfaction of CSIR-NGRI **by 20/03/2017**. Liquidated Damages as described at **Section 4, Clause 4.16.0, sub-clauses 4.16.1 to 4.16.4** of the Tender Document shall apply. In the event of the bidder being unable to complete any of the assigned programs of data acquisition, onboard processing, special processing, interpretation and documentation or delivery within the stipulated period.

Agents

2.43 Bids made by the Agents/Representatives will not be considered. However, original bids of the principals if addressed to CSIR-NATIONAL GEOPHYSICAL RESEARCH INSTITUTE but merely mailed by Agents/Representatives for ensuring proper delivery would be considered. No other modification of the principal's offer by Agent / Representative would be considered.

2.44 In the event a bidder is having an Agent/Representative (who is not an employee of the Bidder), the Bidder should clearly indicate at the time of submission of his bid, the nature and extent of services to be provided by the Agent/Representative on behalf of the bidder and also the remuneration provided, in the price quote submitted by the bidder. Should it be established at any subsequent point of time that the above statement of the bidder is not correct or that any other amount of remuneration either in India or abroad is being paid to anyone (who is not an employee of the bidder), the bidder is likely to have his bid rejected at the discretion of CSIR-NGRI. In such an event, the CSIR-NGRI reserves the right to terminate the Agreement.

Modifications to bids

2.45 The bidder shall make no modifications to the bids after the closing date unless specifically requested for, by CSIR-NGRI. In case certain clarifications are sought by CSIR-NGRI after opening tenders, the reply of the bidder should be restricted to the clarifications sought. Any bidder who modifies his bid (including a modification which has the effect of altering the value of his offer) after the closing date without specific reference by CSIR-NGRI shall make himself liable to be debarred from this Tender and future Tenders of CSIR-NGRI without notice and without further reference to the bidder.

Exceptions and Deviations

2.46 CSIR-NGRI expects the tenders as submitted by Bidder should meet the requirements, provisions, specifications, drawings, etc. as stipulated in the Tender Document without any deviations and exceptions.

Rate of Exchange

2.47 The selling rate of Foreign Exchange as advised by State Bank of India on the date of opening of Price Bids shall be applicable for the purpose of Price Bid Evaluation/comparison.

Date of Tender Submission

2.48 Tender must be received at CSIR-NGRI on or before the closing date as specified in the Notice Inviting Tender and in this Tender Document. In case of any unscheduled holiday on the prescribed closing day of the Tender, the next working day will be treated as scheduled prescribed day of closing of the Tender. Bids or modifications to the bids received after closing date and time shall not be considered, and no negotiations shall be considered. CSIR-NGRI reserves the right to extend the date of submission / closing of tender at the discretion of the Director, CSIR-NGRI, without assigning reasons.

2.49 Once the technical evaluation is completed, the Price Bids of only those bidders who are found technically acceptable will be opened in the presence of Authorized Representatives of such bidder(s), if any.

Unsolicited Post-Tender Reduction

2.50 The bidder shall note that any unsolicited post-tender reduction by them would disqualify them from participating in this as well as future tenders.

Signing of the Agreement

2.51 Telefax or email will communicate acceptance of the Tender by CSIR-NGRI. In case where acceptance is communicated by Telefax, a letter in confirmation of acceptance of Tender will be forwarded to the bidder as soon as possible, but instructions contained in the Telefax / email should be acted upon immediately.

2.52 The successful bidder shall be required to execute a formal Agreement in accordance with the requirement of CSIR-NGRI within 30 days from the date of issue of fax/letter of intent by the CSIR-NGRI or within such extended time as may be permitted by CSIR-NGRI. For this purpose the successful bidder may depute his authorized representative along with power of Attorney.

Arbitration

2.53 The agreement shall be subject to the Arbitration and Conciliation Act 1996 (amended from time to time) and in case of any dispute, Arbitration proceedings shall be held in the State of Telangana, India and laws of India will be applicable.

The Purchaser and the supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

If, after twenty-one (21) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Purchaser or the Supplier may give notice to the other party of its intention to commence arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Goods under the Contract. .

The dispute settlement mechanism/arbitration proceedings shall be concluded as under:

- (a) In case of Dispute or difference arising between the Purchaser and a domestic supplier relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Indian Arbitration & Conciliation Act,1996, the rules there under and any statutory modifications or re-enactments thereof shall apply to the arbitration proceedings. The dispute shall be referred to the Director General, Council of Scientific & Industrial Research and if he is unable or unwilling to act, to the sole arbitration of some other person appointed by him willing to act as such Arbitrator. The award of the arbitrator so appointed shall be final, conclusive and binding on all parties to this order.
- (b) in the case of a dispute between the purchaser and a Foreign Supplier, the dispute shall be settled by arbitration In accordance with provision of sub-clause (a) above. But if this is not acceptable to the supplier then the dispute shall be settled in accordance with provisions of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules.

The venue of the arbitration shall be the place from where the purchase order or contract is issued.

Notwithstanding any reference to arbitration herein,

- (a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and
- (b) the Purchaser shall pay the Supplier any monies due the Supplier.

Governing Language

The contract shall be written in English language which shall govern its interpretation. All correspondence and other documents pertaining to the Contract, which are exchanged by the parties, shall be written in the English language only.

Applicable Law

The Contract shall be interpreted in accordance with the laws of the Union of India and all disputes shall be subject to place of jurisdiction as specified in SCC.

Notices

Any notice given by one party to the other pursuant to this contract/order shall be sent to the other party in writing or by cable, telex, FAX, e-mail or and confirmed in writing to the other party's address specified in the SCC.

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

END OF SECTION 2

SECTION 3 EVALUATIONS OF BIDS

TECHNICAL

3.1 The Technical bids will be opened on **26/12/2016 – 11.30 a.m. (IST)** in the office of CSIR-NGRI, Hyderabad, in the presence of the bidders or their authorized representatives or their Indian agents. The bids will be technically evaluated for data acquisition and processing capabilities of the bidders on the basis of the technical information supplied by them. Bids not conforming to specifications and technical criteria given in **Section 5** and **Annexure A** of this Tender Document shall be rejected.

Evaluation of Technical Bids (Part – I)

3.2 The Technical Bids shall be evaluated on the basis of the information provided in the Technical Bids only vis-à-vis its conformity with the instructions set out in this Tender Document according to Annexure B(ii).

3.3 The bidders may be required to give a **Technical Presentation** before a Tender Evaluation Committee at their own cost, if necessary.

3.4 Based on a Technical assessment of the bids vis-à-vis the requirements of the tendered work and the conformity of the bids submitted with the instructions provided in this Tender Document, a short-list of the bidders will be first drawn up.

3.5 Once the technical evaluation is completed, the Price Bids of only those bidders who are found technically acceptable will be opened for Price Bid evaluation in presence of Authorized Representatives of such bidder(s), if any, on a date and at a venue to be intimated by CSIR-NGRI to the short-listed bidders.

Evaluation of Financial Bids (Part – II)

3.6 The following vital commercial conditions should be strictly complied with, failing which the bid will not be considered:

3.7 The following standard clauses of CSIR-NGRI as incorporated in this Tender Document are to be complied with *in total*, failing which the bid will be rejected:

- (i) Submission of Bank Guarantee for Performance of execution of agreement as well as for satisfactory performance during Agreement period
- (ii) Failure & Termination clause and Liquidated Damages clause
- (iii) Jurisdiction clause
- (iv) Force Majeure clause
- (v) Arbitration clause
- (vi) Total liability of Personal Income Tax on jobs executed in India

Exchange Rate Fluctuations

3.8 The Indian bidders are free to quote firm price fully in Indian currency or in Indian currency for the indigenous portion and in any foreign currency to the extent of imported components of the services to be effected. The quoted currency will not be allowed to be changed subsequent to the submission of the tender document. For the purpose of comparative evaluation, the quoted foreign exchange component will be converted into rupee at the selling rate prevailing on the date of opening of price bid.

3.9 The BC selling rate of State Bank of India (SBI) on the date of opening of price bid shall be applicable for the purpose of comparison. Where the time lag between the opening of price bid and final evaluation exceeds 3 (three) months, the BC selling rate of SBI on the date of final evaluation will be adopted for conversion.

3.10 Indian Bidders must clearly indicate the Foreign Exchange Content and the currency of the requirement in their bid. Otherwise, CSIR-NGRI will not make payment in foreign currency to Indian bidders.

3.11 Foreign Bidders should indicate price component, which are acceptable to them in non-convertible Indian Rupees.

Payment of Duty and Tax

3.12 The import of any materials/equipment/components as may be required for the work will have to be arranged by the successful bidder who shall become the Contractor and CSIR-NGRI will not provide any import license. But CSIR-NGRI will provide Customs Duty Exemption Certificate, as per Customs Notification No. 51/96-Cus dated 23.7.96

3.13 Payment of all duties including **Excise Duty and Customs Duty** will be to the account of the successful bidder who shall become the Contractor.

3.14 The Contractor shall bear all **Indian Corporate Taxes** levied or imposed on the Contractor under the Agreement, under the provision of Income-Tax Act 1961 or any amendment thereof and under the Company's (profit) Surcharge/tax 1964 or any amendment thereof on account of payments received by it from the CSIR-NGRI for work done under the Agreement. It shall be the responsibility of the Contractor to submit to the concerned Indian Authorities the returns and all other connected documents required for this purpose.

3.15 The Contractor shall also provide CSIR-NGRI such information as it may require with regard to the Contractor's income and expenditure under the AGREEMENT for proper assessment of taxes and duties.

3.16 The Contractor or his personnel shall bear all **personnel taxes** if any levied on the Contractor's personnel.

3.17 Should the Contractor fail to submit returns/pay taxes in time as stipulated under the **Income Tax Act** and consequently any interest or penalty is imposed by the Indian Income Tax Authority, the said interest/penalty shall be paid by the Contractor only.

3.18 CSIR-NGRI shall if so required by the applicable laws in force withhold from the amount due to the Contractor, income tax payable by the Contractor at the rate in force, and pay to the Indian Tax Authority directly. It shall be the Contractor's sole responsibility to determine the amount of Taxes as due and admissible and the likely rate at which the deductions will be made on account of taxes etc. by CSIR-NGRI for payment to the Indian Tax Authorities.

Cost Evaluation

3.19 It may be noted that the purpose of the methodology and formulation as given below is for cost evaluation only. The quantum of work given in evaluation formula is also for purpose of cost evaluation only.

3.20 The evaluation of the cost will be done based on the total cost. The total cost will be calculated from the information provided by the bidders in their Price bids as set out in **Annexure B (i)** using the formula in **clause 3.21** below. The bid conforming to the lowest cost would then be considered for further negotiations, if required and award of work. The decision of CSIR-NGRI will be final and binding.

3.21 Financial **Bids shall be evaluated based on the following formula:**

TOTAL COST =

Mobilization cost (including travel time from port of mobilization* to survey area)
+(MCS acquisition and onboard processing per line kilometer cost x 400)
+ (cost for acquisition and processing of OBS data per unit x 60 locations)
+ fees for the pre-stack depth migration of MCS data (lumpsum)
+ fees for travel time tomography of OBS data (lumpsum)
+ cost for acquisition and processing the G/M and bathymetry data (lumpsum)
+ standby charges per day (to be quoted for one day)
+demobilization cost (including the travel time from survey area to port of demobilization)
+ cost of interpretation and documentation of MCS and OBS data+ service tax.

*: port of mobilization is Chennai

3.22 The gross per line kilometer cost will be calculated by adding per line km costs of data acquisition, basic processing, special processing etc. as per the details provided in **Section 5**. The cost also includes all deliverables as provided in **Annexure F**.

3.23 The above formula is used for cost evaluation only. The actual payment will be based on the actual quantum of work completed by the successful bidder.

3.24 The decision of CSIR-NGRI shall be final and binding.

END OF SECTION 3

**SECTION 4
DRAFT SERVICES AGREEMENT**

AGREEMENT DATED THIS DAY OF ----- .

BETWEEN: National Geophysical Research Institute, an autonomous society registered under Societies Registration Act, 1860 having its registered office at Hyderabad, Telangana, herein after called the CSIR-NGRI, which expression shall include, unless repugnant to context, its successors and assigns, represented by.....

AND: XXX hereinafter called "the Contractor" represented by holder of General Power of Attorney dated executed pursuant to Resolution No. dated passed by Board of Directors.

INTRODUCTION

Whereas

- A. the CSIR-National Geophysical Research Institute (hereinafter referred to as CSIR-NGRI) requires: (a) marine geophysical survey services to be carried out to support CSIR-NGRI's research program in the Andaman sea for the purpose of imaging the subduction zone and
- B. the Contractor agrees to provide the equipment, personnel and deliverables to carry out the services,
- C. the parties now wish to record the basis on which the services are to be provided.

NOW THE PARTIES AGREE AS FOLLOWS:

4.1.0 Statement of Purposes

- 4.1.1 This Agreement is entered into by CSIR-NGRI and the Contractor to specify:
- . The Services to be provided to CSIR-NGRI by the Contractor;
 - . The amounts to be paid by CSIR-NGRI for the services rendered.

4.2.0 Definition

4.2.1 In this Agreement, unless the context otherwise requires: "**Acquired Data**" means the data collected or recorded during the survey operations specified by this Agreement; "**Client Representative**", means the representative(s) duly appointed by CSIR-NGRI for the supervision of the Services as performed by the Contractor; "**Commencement Date**", means the date on which this Agreement comes into effect pursuant to **clause 3.1** of the Agreement; "**DGPS**" means Differential Global Positioning System;

"**Downtime**" means all times during the term of this Agreement when operations are not carried out:

- (a) due to the breakdown or repair of any part of the Equipment;
- (b) due to suspension of the Operations by the CSIR-NGRI Representative;

- (c) due to breach of quality control specifications described in this Agreement, and
- (d) all other times which are not chargeable by the Contractor to CSIR-NGRI under this Agreement;

"Force Majeure" means but not be limited to any act, circumstances or event beyond the control of either party, including, without limitation, earthquakes, fires, tropical cyclones, other acts of God, riots, strikes, lock outs, insurrection resulting from rebellions, civil disturbances or orders from governmental authority. For the avoidance of doubt, equipment breakdown shall not be considered a Force Majeure event;

"EEZ" means Exclusive Economic Zone;

"Expiry Date" means the last date i.e. **20/03/2017** for the performance of any outstanding obligation under this Agreement,

"GPS", means Global Positioning System;

"Operations" mean:

- (a) acquisition of the data described in the Tender Document and conducted on a 24 hour per day basis;
- (b) processing of the data acquired, as detailed in the Tender Document;
- (c) provision of reports/maps/charts/data in accordance with the specified deliverables in the **Annexure 'F'** to this Agreement; and all other activities associated with or ancillary to (a) to (c) above;

"Operation fees" mean the fee charged for carrying out all the Operations detailed in the Tender Document according to the terms of this Agreement, while meeting all the agreed specifications.

"QC" means quality control;

"Contractor" means the successful bidder with whom this Agreement is entered into;

"Standby" means all times when Operations are not held out during the term of this Agreement and shall also include;

1. deployment of the vessel at CSIR-NGRI's request, for purposes other than the tendered Surveys;
2. scouting hazardous areas and avoiding obstructions encountered while on line; delays caused by bad weather, during the good weather window (October to May) which do not permit the work to be carried out under the stipulated standards;
3. reconfiguring (but not repairing) equipment at CSIR-NGRI's request including for laying
4. longer spread and vice - versa;

5. waiting for CSIR-NGRI 's personnel, or for instructions to be furnished by CSIR-NGRI; or for travelling, performing data drops or personnel exchanges where such activities are performed solely at CSIR-NGRI's request and are not scheduled by Contractor.

"Standby Rate" means the fee chargeable per day when the Operations are delayed or prevented by those events defined as being causes of Standby; this may be charged on an hourly basis.

"Vessel" means the vessel used by the Contractor for all activities required to complete the services under this Agreement.

4.2.2 Interpretation-

In this Agreement, unless the context requires otherwise

- (a) words denoting the singular number shall include the plural and vice versa;
- (b) words denoting any gender shall include all genders;
- (c) where a word or phrase is defined, other parts of speech and grammatical forms of that word or phrase shall have corresponding meanings;
- (d) words denoting natural persons shall include corporations and vice versa;
- (e) references to clauses, sub-clauses, paragraphs, sub-paragraphs and Annexures are to clauses, sub-clauses, paragraphs, sub-paragraphs and Annexures to this Agreement;
- (f) headings are for convenience only and shall not affect interpretation;
- (g) references to any party to this Agreement shall include the parties' successors and permitted assigns;
- (h) references to "CSIR-NGRI" shall include the Director of the CSIR-National Geophysical Research Institute, or any duly appointed (in writing) representative; references to "Contractor" shall include any servant, agent, employee, invitee, Contractor or sub-contractor of the Contractor.

4.3. Terms of Agreement

4.3.1 This Agreement shall come into effect on the date of signature and subject to the termination provisions pursuant to **clause 4.11** or to a variation of date pursuant to **clause 4.19**, of this Agreement, shall end on the Expiry Date.

4.3.2 The following documents form the Agreement between the parties and shall be read together as one document. However, in case of any conflict, this Agreement shall prevail.

- (a) This Agreement
- (b) The Instructions to Bidders
- (c) The documents submitted by the bidder substantially in the form set out in the Tender Document purchased from CSIR-NGRI, the Appendices and any amendments thereto;
- (d) Manuals and Plans, Emergency Response Plans, Health & Safety Manuals, Operation Manuals, Quality Assurance Manual, Technical Specification Manuals,

Vessel Operation Plans, as submitted by the bidder/Contractor, with any changes or variations negotiated and agreed on by both parties;
(e) The letter of intent, if any, issued by CSIR-NGRI;
(f) The letter of award;
(g) The Performance Guarantee.

4.4. Obligations of the Contractor

4.4.1 The Contractor agrees to provide to CSIR-NGRI the services specified in this Agreement.

4.4.2 In performing the services and fulfilling all its objectives under this Agreement the Contractor:

4.4.3 warrants that the services to be provided will be to the satisfaction and approval of CSIR-NGRI; and

4.4.4 assumes full responsibility for providing all personnel, documentation, Vessels, aircrafts and helicopters (if required) and equipment to undertake the Services, and warrants that all Vessels, equipments, systems, personnel and facilities to be used will be suitable for their intended use under this Agreement, and to ensure the quality of results required there under; and

4.4.5 shall perform his duty as a normal function of initiating any major survey, conduct industry standard tests/calibration on all electronic equipment including navigation, to ensure proper function of all systems prior to the start of survey, and during normal operations, if required, at no extra charge to the Charterers; and

4.4.6 assumes full responsibility for caring all Vessels, equipments, systems and documentation used to provide the services from the commencement date until conclusion of survey as declared so by CSIR-NGRI; and

4.4.7 assumes responsibility for the arrangement and costs of all access and other permits, including Ministry of Home Affairs (MoHA) clearance of the crew and personnel deployed by the contractor, Ministry of Defense clearance (MOD) and Indian Navy (ODAG) clearance for the vessel for conducting the seismic survey as defined in this tender document, that the Contractor is required and authorized to acquire to provide to perform the Services, CSIR-NGRI may assist at its sole discretion; and

4.4.8 shall take out appropriate insurance coverage as set out in **Annexure D**; and

4.4.9 CSIR-NGRI shall obtain and maintain all licenses and permission necessary to conduct the geophysical surveys that the contractor needs, including those required for entry of the vessel, men and material to the work area; and

4.4.10 shall in providing the services under this Agreement, act in a skillful, diligent, workmanlike, careful and proper manner and in accordance with any applicable laws and regulations of India and with standards and practices normally exercised by a professional in the performance of the same or similar services; and

4.4.11 agrees to comply with all Laws and regulations of the country including, but not limited to, the laws in respect of navigation, use of wireless equipment, maps and charts, port/harbor/airport entry and security regulations, foreign exchange, work permits, import and export and patents; and

4.4.12 undertakes to make available, before the commencement of the work, at the initial port of call in India, the Vessel and its equipment for inspection by the Indian Naval Authorities for clearance from the Security angle; and

4.4.13 undertakes to provide and make available space for four of the Client's representatives (excluding Indian cook) during the entire survey period, and to provide boarding & lodging, and voice, facsimile and data communication facilities on the survey vessel to these personnel at no extra cost to CSIR-NGRI; and

4.4.14 provides a qualified Indian cook to cater exclusively to the Charterers' representatives on board; and

4.4.15 agrees to provide for CSIR-NGRI's approval, prior to the commencement of the surveys, a Vessel Operation Plan, including, but not restricted to, a detailed maintenance program of the Vessel and equipment, a status report of the Vessel including its Classification Certificate, a system to ensure that the Vessel and all equipment onboard are seaworthy and that the validity of their certificates are maintained, a system to ensure adequate preventive and corrective maintenance of the Vessel and equipment, a detailed plan setting out the communications between the Vessel, the onshore operating organization and other parties during normal operation, an emergency preparedness plan for the Vessel, a system to ensure that only qualified, experienced and properly trained personnel operate the Vessel and equipment, and a system to deal with non-conformances of the Vessel, equipment and specifications; and

4.4.16 undertakes the sole responsibility to man the Vessel with appropriate, certified and/or qualified and medically fit personnel in accordance with the relevant national and international requirements; and

4.4.17 undertakes to ensure that all the relevant personnel of the Contractor have adequate understanding of the mandatory rules, regulations, IMO Codes and maritime industry standards and any other requirements pertaining to the work; and

4.4.18 takes responsibility to ensure that all the personnel are aware of their duties, that all possess the skills necessary for the proper execution of the tasks they are to perform, and that the personnel providing the Services onboard do not use alcohol, drugs or narcotics which may influence their duties; and

4.4.19 undertakes to furnish full particulars of all crew such as their name, nationality, passport number, place of birth, designation, records of their qualification, etc. at least fifteen days prior to commencement of the work, to CSIR-NGRI; and

4.4.20 undertakes to comply with the Labor Laws of India and afford to the personnel conditions of service not less favorable than the conditions pertaining to an Indian under Indian laws; and

4.4.21 undertakes to remove and replace at its own expense, any of the Contractor's personnel whose presence onboard is considered undesirable in the opinion of CSIR-NGRI; and

4.4.22 undertakes to provide (including but not limited to) all materials, labor, expenses, consumables, fuel, lubricants, and data media, such as tapes, paper, CD's, DVD's, external hard diskettes, as may be required for the performance of the Services; undertakes the responsibility of deleting / erasing all the product of the acquired, processing and interpretation of the seismic data (MCS or OBS) from the computers/ Hard disks/ or any other media used for the purpose in the course of the survey and any paper print outs or maps, or notings made shall be handed over to CSIR-NGRI; and

4.4.23 undertakes to deliver, upon the completion of the work, all originals and copies of maps, charts, documents, reports, and data provided by CSIR-NGRI or acquired/generated by the Contractor in the course of providing the services, along with the storage media and the particulars of the format of recording of the data, in a properly packed and secured manner to CSIR-NGRI or to any of its designated offices in India; and

4.4.24 undertakes to provide all the deliverables as provided in **Annexure F** of the Tender Document within the time schedule provided; and

4.4.25 takes full responsibility for the removal and appropriate disposal of any wreck or debris of the vessel(s) or any part thereof; and

4.4.26 is fully liable for compliance in all respects with, and giving of all notices and paying of all taxes, duties and fees as required by the provisions of any Indian law or by-law; and

4.4.27 is fully liable for payment of Customs duty and other charges and for arranging clearance from the Customs and Port Authorities, all equipment, instruments, other items Scientists/technical personal from CSIR-NGRI participating in the vessel for data acquisition as may be required for providing the Services, whenever such clearances are necessary; and

4.4.28 undertakes to re-export all equipment, spares and consumables that were imported into India but were not consumed for providing the Services under this Agreement, and to bear any penalty that may be levied by the Indian authorities for delay/failure to re-export such material after the completion of the work within such a time as stipulated by the Indian authorities; and

4.4.29 undertakes to bear all costs and delays arising out of any breakdown, industrial action and any other contingency

4.4.30 If the Contractor breaches any of its obligations under this clause, the Contractor shall remedy, at its own cost, any defect, which includes any failure to meet the

required standard(s), to the CSIR-NGRI's satisfaction and within such time as may be specified by CSIR-NGRI.

Obligations of CSIR-NGRI

4.4.31 CSIR-NGRI agrees to pay to the Contractor the total agreed price in the manner provided in this Agreement on complete satisfaction of the performance by the Contractor of its obligations under this Agreement.

4.4.32 CSIR-NGRI, at its sole discretion, may assist the Contractor in obtaining the necessary Government permit/authorizations facilitating the Contractor to provide the Services, if the Contractor furnishes full and relevant information in advance to CSIR-NGRI, but it shall not create any contractual obligation or liability against CSIR-NGRI.

4.4.33 Except as may otherwise be stipulated, CSIR-NGRI does not assume responsibility for the adequacy or accuracy of any of the information and data provided to the Contractor. It shall be the Contractor's responsibility to verify and supplement such information and data, and be responsible for the effect that such failure of verification may have on the cost of performing the services.

4.5 Vessel standby

4.5.1 No charges including standby charges are payable by CSIR-NGRI for vessel component and personnel for

4.5.2 Time spent at port during routine port calls arranged by bidder for change of crew, drawal of supplies and time spent in voyage between port and work area(s) and between two work areas.

4.5.3 Work stoppage due to breakdown of vessel or equipment or any other factors for which CSIR-NGRI is not responsible.

4.5.4 Work stoppage ordered by CSIR-NGRI's representative on board for noncompliance with quality standards

4.5.5 Calibration of data acquisition & navigation system: The Contractor would, as a normal function of initiating any major survey, conduct industry standard tests/calibration on all electronic equipment including navigation, to ensure proper function of all systems prior to the start of survey, and during normal operations, if required. This would be at no extra charge to CSIR-NGRI.

4.5.6 The time spent on line changes anywhere within the areas of survey. The time spent on voyage from one area to another will also not be considered for the purpose of standby charges.

4.5.7 Time spent for routine balancing of the streamer, periodic routine instrument checks and calibrations, to meet the requirements of work standards. Time spent on normal industry standard testing and calibration of all equipment. Such testing should include daily and monthly instruments test, gun pulse monitoring, cable tap test, cable depth

indicator calibration, navigation system calibration, and cable positioning system calibration and other industry standard routine tests.

4.5.8 Standby is chargeable at the rate specified in the relevant Price Bid up to a maximum of ten (10) cumulative days. If the period of Standby exceeds ten (10) days, the parties shall agree upon an equitable financial arrangement which shall thereafter apply as long as the Standby persists

4.6 Indemnity

4.6.1 The Contractor shall indemnify and hold CSIR-NGRI harmless against any loss, damage, liability, cost or expense in connection with any claim or charge for damages arising out of:

4.6.2 the fault or negligence of the Contractor, including its officers, agents and other personnel and persons in contract with it in the performance of, or noncompliance with, this Agreement, as the case may be;

4.6.3 the use of any equipment (including chase vessels, plants and equipments) by the Contractor in the course of performing the services.

4.6.4 In particular, and for the avoidance of doubt, the Contractor shall indemnify CSIR-NGRI, against all losses, claims, damages and costs in relation to any of the following matters arising out of or in consequence of the performance of the services:

4.6.5 death or injury to any person;

4.6.6 loss or damage (including loss of use) to any property (including plant, equipment and vessels) or damage to the environment;

4.6.7 damage or compensation to any person in the employment of the Contractor;

4.6.8 infringement of any protected rights;

4.6.9 Professional liability.

4.6.10 The Contractor shall indemnify CSIR-NGRI against all claims in respect of or in connection with any damage to, or destruction or loss or loss of use of property belonging to and/or any death or personal injury to any third party (including in the case of a corporate person or firm, its directors, officers, employees, servants and/or agents).

4.6.11 Notwithstanding **Clauses 4.6.1 to 4.6.3**, both the Contractor and CSIR-NGRI agree that the Ship's Captain may refuse to enter areas reasonably considered to constitute an unreasonable hazard.

4.7.0 Loss of or damage to the acquired data

4.7.1 The Contractor shall be responsible and liable for the damage, loss or theft of the Acquired Data from the time the Acquired Data is recorded until the time the Acquired Data

is received by CSIR-NGRI at the CSIR-NGRI's address or as otherwise specified by the CSIR-NGRI from time to time.

4.7.2 Notwithstanding **Clause 4.7.1**, should any Acquired Data be damaged, lost or stolen:

(a) if the missing data is recoverable from the backup tapes made at the time of acquisition, the Contractor shall generate replacement of data tapes in a form acceptable, and at no charge to, CSIR-NGRI, or

(b) if the missing data is irrecoverable, the terms of **Clause 4.18.5 & Clause 4.18.6** of this Agreement shall apply.

4.7.3 If the data cannot be recovered from the recording media at the processing centre due to the failure of the Contractor to record the data properly, the Contractor shall reshoot the portion of the survey sufficient to reacquire the data damaged or lost, at its cost. A maximum of 120 days may be given to the Contractor for acquisition of the lost data.

4.8.0 Liability of Agreement

4.8.1 The liability of the Contractor and any liability of CSIR-NGRI arising out of this Agreement, is limited in duration **for a period of 5 years** following the completion of the services and is limited to the greater value of the payments made under this Agreement or the amount the party claims and which is paid out under a policy of insurance, except that this limitation shall not apply in respect of the parties liability for willful misconduct or fraud

4.8.2 Neither party will be liable to the other for: –

4.8.2.1 Any consequential damages or indirect loss in relation to the services (including loss of use, revenue, profit or anticipated profit or business interruption);

4.9 Insurance

4.9.1 without limiting the contractor's obligations and responsibilities under this agreement, the contractor shall, at its cost, take out insurance policies with an insurance company approved as per Govt. of India norms, to provide such covers as comprehensive general liability insurance, marine vessel liability insurance and comprehensive automobile liability in respect of the vessel, equipment, personnel including CSIR-NGRI's servants and agents and other relevant items.

4.9.2 The terms and conditions of all policies prior to the commencement date Confirmation of CSIR-NGRI's interested party status in the required public liability insurance policy must be provided to CSIR-NGRI in writing by the contractor's insurers prior to the commencement date at the instance of the contractor, as per Govt. of India norms

4.9.3 All insurance policies must be effected prior to the commencement date and must remain valid during the performance of the Contractor's obligations under this Agreement.

4.10 Use and ownership of information

4.10.1 The parties recognize that under this Agreement they may each receive trade secrets and confidential or proprietary information of the other party, including but not limited to information concerning products, customers, business accounts, financial or contractual arrangements or other dealings, transactions or affairs, reports, recommendations, advice or tests, source and object program codes and development plans. All such information, which is either marked "Confidential" or stated at the time of disclosure and subsequently confirmed in writing to be confidential constitutes "Confidential Information".

Each party:

4.10.1.1 acknowledges the strict confidentiality and proprietary nature of all Confidential Information and that no right, entitlement or interest in either party's Confidential Information is extended or conveyed to other party except for the strict purposes of each party performing its obligations under this Agreement;

4.10.1.2 shall not at any time (other than for the proper performance of its obligations under this Agreement) disclose, divulge, communicate, publish or make available in any way to any person or entity any of the Confidential Information. Nor shall either party at any time for that party's own benefit or the benefit of any other person directly or indirectly take advantage of, use or in any way exploit the Confidential Information;

4.10.1.3 shall take all reasonable steps to preserve the confidentiality of the Confidential Information and each party shall indemnify the other party from all losses, damages and expenses it may incur or sustain as a result of any unauthorized use or disclosure of one party's Confidential Information by the other party;

4.10.1.4 shall upon request by the other party, and upon termination of this Agreement, immediately deliver to the other party all material relating to that other party's Confidential Information (including all copies of such material);

4.10.1.5 acknowledges that the obligations of confidentiality imposed upon each party shall continue (unless the Confidential Information reaches the public domain other than through the receiving party's own fault) notwithstanding that this Agreement may in all other respects have terminated.

4.10.2 All intellectual property rights relating to those products or services created under this Agreement shall be the sole property of CSIR-NGRI.

4.10.3 Ownership of all Acquired Data is assigned to CSIR-NGRI at the time it is initially recorded.

4.11 Termination

4.11.1 The Parties may agree to vary the length of the program on acceptable terms by notice in writing between them

4.11.2 This Agreement shall automatically be terminated on expiry of its term or any extension thereof.

4.11.3 CSIR-NGRI may terminate this Agreement:

- in the event of Force Majeure existing for a period longer than fifteen (15) days;
- if Operations are suspended for more than fifteen (15) consecutive days of Downtime; and
- If CSIR-NGRI considers that the performance of the Contractor is unsatisfactory and/or not up to the expected standard. In such circumstances, CSIR-NGRI shall notify the Contractor and specify in detail the causes of dissatisfaction and shall reserve the right to terminate the Agreement by giving ten (10) days notice provided the Contractor fails to rectify at the cost of the Contractor the defects within that period.

4.11.4 Notwithstanding anything contained herein, CSIR-NGRI may at its sole discretion terminate this Agreement by giving Thirty (30) days written notice without assigning any reasons, whatsoever.

4.11.5 In the event of any termination, the Contractor shall cease work as directed by CSIR-NGRI and shall forward to the CSIR-NGRI all Acquired Data, reports, maps and other documents.

4.11.6 In all cases of termination herein set forth, the obligation of CSIR-NGRI to pay the rates and/or any other charges shall be limited to the period up to the date of termination.

4.11.7 Termination of this Agreement shall be without prejudice to any rights and remedies accrued to either Party prior to such termination.

4.11.8 If either party is in default under this Agreement on account of the failure to perform or observe any obligation or undertaking to be performed or observed on its part under this Agreement, the party not in default may, subject to **Clause 4.11.9**, by notice in writing to the other party, terminate this Agreement in whole or in part without prejudice to any right of action or remedy which has accrued or which may accrue in favor of either party.

4.11.9 Where the default is capable of being remedied, a party shall not exercise its rights to terminate this Agreement unless it has given to the defaulting Party a written notice specifying the default and requiring it to remedy the default within such time (being not less than five (5) working days) as may be specified in the notice.

4.11.10 if either Party goes into liquidation or a receiver or receiver and manager or mortgagee's or charge's agent is appointed or, in the case of an individual, becomes bankrupt or enters into a scheme or arrangement with creditors, the other Party may, by notice in writing, terminate this Agreement without prejudice to any right of action or remedy which has accrued or which may accrue in favor of either Party.

4.11.11 The termination of this Agreement shall not affect those terms which, by their nature, are intended to survive termination.

4.12.0 Arbitration

4.12.1 If any dispute, difference, question or disagreement shall, at any time hereafter arise

between the parties hereto in connection with or arising out of the Agreement or in respect of meaning of specifications, design, drawings, estimates, schedules, annexure, order, instructions, the construction, interpretation of this agreement, application of the provisions thereof or anything hereunder contained or arising hereunder or as to the rights, liabilities or duties of the said parties hereunder or any matter whatsoever incidental to this agreement whether arising before or after the completion of the work under this Agreement, which cannot be mutually resolved by the parties, the same shall be referred to arbitration.

- 4.12.2 The party desiring the settlement of dispute shall give notice of its intention to go in for arbitration clearly stating the point of dispute to be decided by arbitrators and appoint its own arbitrator and call upon the other party to appoint its own arbitrator within 30 days. If the other party fails to appoint its arbitrator within stipulated period or the two arbitrators fail to appoint the third arbitrator, the court having jurisdiction shall appoint the second or third arbitrator as the case may be.
- 4.12.3 That the arbitrator so appointed is an employee of CSIR-NGRI or that he had to deal with the matters to which the agreement relates and that in the course of his duties as CSIR-NGRI employee he had expressed views on all or any of the matters in dispute or difference in favor of the CSIR-NGRI, shall not be an objection to his appointment as an arbitrator.
- 4.12.4 If any of the arbitrators to whom the matter is originally referred to dies or refuses to act or resigns from the position of arbitrator for any reasons, a new arbitrator shall be appointed by the respective party who made the earlier appointment or together by both the arbitrators, in the manner aforesaid. The arbitrator Tribunal so constituted shall be entitled to proceed with the reference from the stage at which it was left.
- 4.12.5 The arbitrator Tribunal shall conclude the arbitration proceedings at the earliest after entering into reference.
- 4.12.6 The arbitrator Tribunal shall give reasoned award in respect of each dispute or difference referred to them.
- 4.12.7 The venue of Arbitration shall be in the state of Telangana, INDIA.
- 4.12.8 The provisions of the Arbitration & Conciliation Act, 1996 (as amended from time to time) and the rules made there under for the time being in force shall apply to the arbitration proceedings under this clause.

4.13.0 Applicable Law & Jurisdiction

- 4.13.1 This Agreement, including all matters connected with this agreement, shall be governed by the Indian Laws both substantive and procedural, for the time being in force and as amended from time to time and shall be subject to the exclusive jurisdiction of **Indian Courts at Telangana, India.**

4.14.0 Force Majeure

- 4.14.1 Any failure by a Party to comply with the terms of this Agreement shall be excused if, and for so long as, compliance is hindered or prevented by reason of Force Majeure. Without prejudice to the rights of CSIR-NGRI to terminate this Agreement under **Clause 4.11.3**, that Party shall not incur liability for as long as the Force Majeure persists.
- 4.14.2 In the event of either party being rendered unable by Force Majeure to perform any obligations required to be performed by him under this Agreement, the relative obligations of the party affected by such force majeure shall, after notice as per **clause 4.14.3** be suspended for the period during which such cause lasts.
- 4.14.3 Upon the occurrence of such cause and upon its termination, the party alleging that it has been rendered unable as aforesaid, shall notify the other party in writing within 24 (Twenty Four) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of its claim.
- 4.14.4 During the period the obligations of the parties are suspended by Force Majeure, the Contractor shall not be entitled to any charges either as standby or otherwise.
- 4.14.5 In the event of Force Majeure conditions continuing or reasonably expected to continue for a period of more than Fifteen (15) days, the CSIR-NGRI shall have the option of terminating this Agreement by giving Seven (7) days notice. If this Agreement is so terminated, either party shall pay to the other party, the money payable up to the date of such termination.

4.15.0 Continuance of the Work

- 4.15.1 Notwithstanding any disagreement, dispute, protest, request for arbitration or court proceeding relating directly or indirectly to the works, at all times Contractor shall proceed with the work in accordance with the determinations, instructions and clarifications of CSIR-NGRI. If the Contractor fails to proceed with the work, he shall be considered to be in default. Such Contractor shall be held liable for any costs and expenses arising from its failure to do so. During the period the Contractor is proceeding with the work, he shall be paid the undisputed portion of his claim or payment, under the Agreement.

4.16.0 Liquidated Damages

- 4.16.1 If the Contractor fails to mobilize survey vessel(s), equipments, & personnel or fails to complete the work within the stipulated period or at any time repudiates Agreement before completing such work, CSIR-NGRI may without prejudice to any other rights or remedies available to CSIR-NGRI, recover from Contractor as ascertained and agreed Liquidated Damages and not by way of penalty:
- 4.16.2 The sum equivalent to 0.5% of Agreement price for each week's delay or part thereof, subject to a maximum of 5% (five percent) of the Agreement price, even though, CSIR-NGRI may accept the work after expiry of the Agreement period for

completion of the work. CSIR-NGRI will not consider any claims made by the Contractor in respect of the additional costs incurred, if any, due to the extension of time granted by CSIR-NGRI

4.16.3 CSIR-NGRI may arrange for the operations or part of the operations in default by Contractor to be carried out elsewhere on the account and at the risk of the Contractor. Such decision of the CSIR-NGRI shall be final and binding on the Contractor. CSIR-NGRI in such an event may not terminate the Agreement.

4.16.4 At the CSIR-NGRI option, the amount against the Liquidated Damages may be recovered from Contractor at the time of payment of any outstanding invoices to Contractor or from the Performance/Bank Guarantee and/or adjusted against any payment due to the Contractor without prejudice to any of the other rights/remedies available to CSIR-NGRI under the terms of the Agreement.

4.16.5 The remedy provided by this Clause is in addition to other rights and remedies provided by law or under the Agreement.

4.17.0 Assignment

4.17.1 The Contractor may sub-contract the services under this Agreement or any benefits or interests arising under it, subject to the prior written approval of CSIR-NGRI.

4.18.0 Warranty and Acceptance of Work

4.18.1 The Contractor warrants that the survey work will be performed in accordance with this Agreement and good scientific practice and standards

4.18.2 The Contractor hereby warrants the correctness of the Acquired Data for the period specified in **Clause 4.8.1**

4.18.3 If during this warranty period, CSIR-NGRI discovers that any of the Acquired Data is not satisfactory; the Contractor shall incur liability as provided in **Clause 4.18.5 & 4.18.6**

4.18.4 The Contractor shall, at CSIR-NGRI 's option, either:

4.18.5 immediately reacquire the missing or affected Acquired Data at its own cost; or

4.18.6 reimburse to the CSIR-NGRI all expenses incurred by CSIR-NGRI in respect of the missing or affected Acquired Data.

4.19 Variations

4.19.1 This Agreement as specified in **Clause 4.3.2** constitutes the entire agreement of the Parties.

4.19.2 No variation in the terms and conditions of this Agreement will be valid unless made in writing by authorized signatories of both parties.

4.20 No agency

4.20.1 The CSIR-NGRI and the Contractor act independently of each other. Neither party is agent for the other nor does a party have any authority to enter into any agreement, whether expressly or by implication, in the name of the other party, without that party's prior written consent for express purposes connected with the performance of this Agreement.

4.21 Language for Communication

4.21.1 The language of the Agreement and of all notices and communications hereunder shall be in English.

4.22 Severability

4.22.1 Any term of this Agreement will be interpreted to the extent necessary to prevent that term being invalid, voidable or unenforceable in the circumstances.

4.22.2 If, notwithstanding voidable: Clause 4.22.1, a term of this Agreement is invalid or

4.22.3 that term would not be invalid or voidable if a word or words were omitted, that word or words shall be deleted; and

4.22.4 in any other case, the whole term shall be deleted, and the remaining terms shall continue to have full force and effect.

4.23.0 Waiver

4.23.1 A party's failure to require the other party to perform any of its obligations, or to claim damages for any breach under this Agreement shall not constitute a waiver of that party's right unless the waiving party acknowledges the waiver in writing, signed by the CSIR-NGRI and a duly authorized person of the Contractor.

4.24.0 Time is the essence

4.24.1 Time shall be the essence as regards any date or period determined under this Agreement unless any date or period specified in this Agreement is varied or amended according to **Clause 4.19.2**, in which case time shall be of the essence as regards the varied date or period.

4.25.0 Public statements

4.25.1 This Agreement is confidential. Neither party shall publicize its existence or its terms. The Contractor shall not use the name or any trade mark or trade name, whether registered or not, of CSIR-NGRI, in publicity releases or advertising or in any other manner, including any customer lists, without securing the prior written approval of the CSIR-NGRI.

4.26.0 Notices

4.26.1 Any notice given under this Agreement by either party to the other must be in writing and may be delivered personally or sent by facsimile followed by post with advice of delivery. In the case of facsimile, the notice will be deemed to have been given upon receipt of the correct answer-back or receipt code. Notices will be delivered or sent to the parties addresses listed below or to any other address notified in writing by either party to the other for the purpose of receiving notices after the date of this Agreement.

4.26.2 The address for service to CSIR-NGRI is:

DIRECTOR
CSIR-NATIONAL GEOPHYSICAL RESEARCH INSTITUTE
UPPAL ROAD, HYDERABAD-500007, INDIA

4.26.3 The address for service to the Contractor is:

company name

contact person

street address 1

street address 2

post box

city, post code, country

Facsimile: (00)

In witness whereof, the parties hereto have caused this AGREEMENT to be executed in triplicate by their duly authorized representatives at Hyderabad

For and on behalf of CSIR-NGRI
Contractor

Signature
Name
Position
Place
Date

WITNESS

For and on behalf of the

Signature
Name
Position
Place
Date
Under General Power of Attorney
dated executed pursuant to
Resolution No. _____ dated
_____ passed by Board of
Directors.

WITNESS

Name & Address

Name & Address

END OF SECTION 4

SECTION 5

SPECIFICATIONS OF SURVEY

5.1 INTRODUCTION

- 5.1.1 This Section provides specifications of the requirements for conducting marine geophysical surveys in the Andaman-Nicobar region. The data to be acquired by this survey is designed to support India's research programmes for imaging the Andaman - Nicobar subduction zone. Area of operation will be offshore of Andaman within the water depth of 25 m to 5000 m.
- 5.1.2 The primary goals of the survey are the precise imaging and modeling (seismic and G&M) of the subduction in the Andaman – Nicobar Islands.
- 5.1.3 The proposed work consists of (i) acquisition of multichannel seismic reflection, refraction (deployment of Ocean Bottom Seismometers), (ii) preliminary onboard data processing, and (iii) special processing of MCS data and Traveltime (first break and multi-layered) tomography of OBS data (iv) acquisition and processing of marine G&M (gravity and magnetic) data as mentioned in Section 1.3. The survey will be performed at a water depth between 25 to 5000 m.
- 5.1.4 The seismic reflection and refraction data are to be collected along one seismic line of ~400 line km, and at water depths between 25 m and 5000 m
- 5.1.5 The MCS and OBS surveys are to be carried out simultaneously and the coordinates will be provided 15 days prior to the start of the survey.
- 5.1.6 The locations and the number of OBSs to be deployed shall be provided 15 days prior to the start of the survey, but the total number of OBSs to be deployed should be ~60-75. OBS will be deployed with a spacing of 5-10 km, with an offset shooting of 150km at both the ends of 400km profile. Gravity and Magnetic data are also to be acquired along the line.
- 5.1.7 Work flow should be seismic reflection onboard data processing, gravity and magnetic data processing and OBS deployment. Work flow given in 5.9.1.2 should be followed for onboard seismic reflection data processing. Gravity, magnetic and bathymetry data processing as per standard.
- 5.1.8 Specifications given in section 5.5.1 is our basic requirement for seismic, OBS and G&M surveys and CSIR-NGRI reserves the right to vary the specification based on technical evaluation of bid document

5.2 SCOPE

- 5.2.1 The Service Provider shall conduct precise positioning, seismic reflection and refraction data acquisition and onboard preliminary data processing services. Post cruise **Pre-stack Depth Migration, travel-time (first break and multi-layered) tomography, Preliminary Interpretation and Documentation of data should be**

carried out by the Service Provider at CSIR-NGRI. Data can be processed onboard while the vessel returns to port of demobilization (Chennai) with no additional days of ship charter and the rest of the work to be carried out at CSIR-NGRI.

5.2.2 Satisfactory performance of the survey operations will be determined by monitoring a set of online recording parameters, which must meet the Specifications.

5.3 RECORDING SYSTEM SPECIFICATIONS

5.3.1 The recording systems shall comply with the Specifications provided in this Tender Document.

5.3.2 The Service Provider shall keep detailed system log sheets. The log shall include, but be not limited to, date, time (local and GMT), location, line number, line direction, shot point numbers, file numbers, reel numbers, weather, depth readings, energy source data, streamer trace status, missed shots, signal to noise level, navigation malfunctions and the names of the observers. The system log should show all changes in recording configuration, all error messages in acquisition and all instances of deviation from the Specifications.

5.3.3 A streamer-source diagram shall be prepared for each Survey Line or Survey Line Segment. The diagram will show Air gun positions and depths, active streamer offset, water break detectors, depth controllers and compass bird locations. A new diagram should accompany any variation to this configuration along a Survey Line or Survey Line Segment.

5.3.4 All raw data including (but not limited to) positioning, time, gyrocompass, streamer compasses, Shot Point number and seismic file number, streamer and energy source depths, water depth, depth controlling bird angles, etc., and computed vessel, source and source sub-array, streamer head, middle, and tail positions, and vessel velocity shall be recorded on the navigation tape in a format acceptable to CSIR-NGRI for every Shot Point while recording a Survey Line or Survey Line Segment, and wherever possible at least every minute during non recording periods while the Vessel is under way. These and other online logged parameters will be printed onboard once every 100 shot points.

5.4 DATA LOGGING

5.4.1 Recording of data should be done by the state-of-the-art system, which should be of industry standard.

5.4.2 Recording tape speed shall be maintained within the manufacturer's specifications

5.4.3 Tape heads shall be cleaned between each production tape prior to loading or as required by the manufacturer.

- 5.4.4 At the completion of each survey line or part thereof, one record, excluding noise files, from those recorded on each tape transport shall be played back on a different transport to that on which it was originally recorded.
- 5.4.5 These playbacks shall be made of records for which monitors have been made during recording.
- 5.4.6 It shall be possible to read any tape on any transport, regardless of which transport was originally used to record it.
- 5.4.7 Proper precautions shall be observed in recording, sealing, storing and transporting both new and recorded tapes.
- 5.4.8 The Service Provider will warrant that all external disks prepared by the Service Provider in performance of the work and/or services under this contract shall be in conformance to standard requirements for use and information interchange and of such quality that, on the basis of normal wear and tear, and subject to handling and storage of the external disks being as specified by the manufacturer, **CSIR-NGRI is able to use such external disks for a period of at least ten years calculated from the date of recording** and/or use of the external disk by the Service Provider for the work and/or services.
- 5.4.9 During the Seismic Survey, two copies of the digital seismic data in SEG-D format shall be recorded using commonly accepted high volume recording media. These media should be chosen for data longevity on tape and should be in a form as approved by CSIR-NGRI. External hard drives are the preferred media option.
- 5.4.10 All recording and positioning systems shall be synchronized to the designated on-board master clock, which shall be adjusted to within one (1) second of universal time.
- 5.4.11 The Service Provider shall provide the following output on industry standard data cartridges (IBM 3590) in industry standard formats:
- a. Raw data of navigation as well as seismic surveys carried out
 - b. Processed seismic data in -2.5 inches/sec vertical scale, one set of film and two sets of prints of final stacked data (about 35 tpi); -5.0 inches/sec vertical scale, one set of film and one set of print of final stacked data (unmigrated, about 35 tpi); -2.5 inches/sec vertical scale, one set of film and two sets of prints of final migrated data (about 35 tpi); and -5.0 inches vertical scale, one set of film and two sets of prints of final migrated data (about 35 tpi).
- 5.4.12 Polarity
- (i) Polarity convention shall be in accordance with the SEG committee on technical standards recommendations, such that compressional waves produce negative voltages which are recorded as negative numbers on magnetic tape and deflects galvanometers downward to produce wavelet minima (white) troughs on monitors. This shall be checked to CSIR-NGRI's satisfaction prior to the Mobilization.

(ii) All seismic channels shall be recorded and processed with identical polarity. Polarity on magnetic tape recording, read after write playbacks and multi-channel monitors will be identical.

(iii) Polarity shall be checked and confirmed immediately after any instrument or streamer maintenance or at such other times as the CSIR-NGRI Representative reasonably requests.

(iv) Polarity corrections shall be made when necessary at the point of reversal such that correct polarity exists at all test points coupled between the hydrophones and magnetic heads.

5.5 MCS and OBS Specifications

5.5.1 MCS Data Acquisition

5.5.1.1 Coverage

1. One multi-channel reflection seismic line ~400kms

5.5.1.2

| | |
|-------------------------|-----------------------|
| Energy source | : Tuned airguns |
| Minimum volume | : 10,000-12,000 Cu-in |
| Source depth | : 6-8 m |
| Minimum pressure | : 2000 psi |
| Primary to Bubble ratio | : > 15 |
| Frequency band | : 5-125 Hz |
| Peak to peak amplitude | : 30 Bar -m |

The air pressure in the lines to the air guns immediately prior to shot firing shall be minimum 2000 psi. If the pressure drop is less than 2000psi for consecutive 10 shots, then the shooting for that part has to be repeated, at no additional cost to CSIR-NGRI.

Far field signature recording once before beginning of the survey.

The interval between Shot points shall be fixed and Shots shall be triggered by GPS/DGPS positioning at a specified intervals on a geoid surface, in distance mode.

The air gun shall be towed within the depth range of 6-8m with the following parameters during the surveys:

maintained within one m of the specified nominal value

maximum variation of towing depth of any gun within the array is 1.5 m between extremes.

5.5.1.3 Seismic signal system

| | |
|-------------------|---|
| Streamer length | : 10-12 km |
| Near Offset | : Not exceeding 150 m |
| Streamer depth | : 10 m |
| Group Interval | : 25 m |
| Shot Interval | : 100 m |
| No. of Channels | : 480 |
| Sampling Interval | : 2 ms |
| Record Length | : 20 sec. |
| Recording System | : Digital |
| Recording Format | : SEG-D |
| Media | : External disk; back-up to another external disk |
| Polarity | : SEG standard |

5.5.1.4 Digital Streamer

- . Hydrophone sensitivity: 10-30 $\mu\text{v}/\mu\text{b}$.
- . Depth detectors shall be positioned at an interval of 200-300 m along the length of the cable.
- . Streamer shall be towed at a depth of 10 m. The depth should be maintained with an accuracy of 10%.
- . Feathering shall not exceed 10 degrees. In the presence of strong currents, modifications to the vessel speed through water may be agreed upon during the survey by the NGRI representative and the provider in order to maintain specifications for speed over ground, shot spacing, and shot intervals
- . Streamer offset distances (center of seismic energy source to centre of the near group) must be computed on commencement of seismic surveying. Whenever any offset is changed in the middle of the line, the offset distance must be computed soon after completion of the Survey Line. The streamer-offset distance shall be as short as possible and shall not exceed 150 m.

Total ambient noise level should not exceed 3 μb RMS for each channel except at the location of birds when permitted noise level is 5 μb RMS. Noise level shall be monitored before beginning and end of data acquisition on each line/line segment.

Leakage: Less than 500 ohm-m.

Dead/Leaky channel: shall not be more than four when data is being acquired.

5.5.2 Ocean Bottom Seismometer Surveys

60-75 OBS deployments on the same line: shooting to be carried out at a spacing of 100m and OBS spacing is to be 5-10 km

| | |
|-------------------|--------------------------------------|
| Source type | : Tuned airgun |
| Minimum Pressure | : 2000psi |
| Shot Interval | : 100m |
| Volume | : 10,000-12,000 Cu-in |
| OBS type | : hydrophone + 3 components Geophone |
| Total shooting | : 400lkm |
| Sampling interval | : 4 ms |
| Recording Time | : 40s. |

All digital data recorded in 4-component OBS recorders to be preprocessed applying position and time correction and delivered in SEG-Y format on External hard disks.

5.5.3 Marine Gravity and Magnetic surveys

Magnetic measurement to be made at a precision of 0.1nT with the magnetometer sensor towed approximately at 2-3 times the length of the vessel. Continuous magnetic profiling to be carried out during seismic reflection data acquisition, and the inoperability of magnetometer should not delay/suspend the seismic acquisition. Marine Gravity measurement should be made at an accuracy of 0.01mGal (0.1mGal for reduced gravity). Gravity base station readings to be made at every port call, mob and de-mob, and to be tied to at least one jetty in India where absolute gravity is known. Total gravity field measurements shall be measured continuously during the survey. The inoperability of gravimeter should not delay/suspend the seismic acquisition.

All digital data recorded to be delivered in ASCII format in External hard disks.

5.6 NAVIGATION AND POSITIONING

5.6.1 Primary Navigation

- 5.6.1.1 Global Positioning System (GPS) or Differential Global Positioning System (DGPS) capable of providing accurate position in the survey area.
- 5.6.1.2 Accuracy: Maximum possible accuracy with state-of-the-art DGPS/GPS (at least within 25 m of desired location).
- 5.6.1.3 Master Clock: Seismic shot point, navigational and all other geophysical data shall be referenced to one common point fiducial i.e., a survey master clock. The time given by the master clock should be the same as the accurate time given by the DGPS/GPS receiver clock onboard. All work is to be undertaken in terms of the Julian day calendar and Greenwich Mean Time (GMT).

5.6.2 Integrated Navigational System (INS):

- 5.6.2.1 The INS shall provide high precision navigation using state of the art DGPS/GPS as primary navigation with adoption of Gyro and other standard navigational devices and shall provide a recorded position for each shot point location.

5.6.3 Work standards for navigation and positioning

5.6.3.1 All positioning is to be referenced to WGS 84 and Everest Datum, using the datum transformation parameters to be provided by the Service Provider.

5.6.3.2 All survey work is to be undertaken using Latitude and Longitude in terms of WGS 84.

5.6.3.3 All positioning is to be by Differential Global Positioning System (DGPS) / Global positioning System (GPS). The navigational ability shall be adequate to ensure that every shot/observation point is within < 10 m (say) of the intended location or to be certified by quality controller.

5.6.3.4 For this Agreement the Vessel datum point to be used for positioning is to be the primary echo sounder transducer. All Vessel offsets are to be defined with respect to the datum point and a Vessel offsets file and a diagram showing the location of Vessel offsets relative to the datum point is to be rendered.

5.6.3.5 Horizontal accuracy of the Vessel datum point is to be better than 10 metres at the 95% confidence level. If two times the standard deviation exceeds the tolerance for more than 5% of the positioning fixes on a line or part of a line, all data are considered to be out of specification and that line or part of line will be considered for re-surveying.

5.6.3.6 While alongside the wharf, before work commences, the Vessel's gyro and DGPS/ GPS positions should be calibrated using shore-based survey points and the gyro and DGPS/ GPS error should be determined as falling within acceptable limits. Positioning confidence checks are required during the course of the survey.

5.6.3.7 Processing of navigation data shall be carried out by the Service Provider as per standard practice in the industry, at no extra cost to CSIR-NGRI:

5.6.3.8 The following output shall be supplied to CSIR-NGRI at no extra cost:

- i. The print of post plots (three sets) along with original film in four different and suitable scales.
- ii. Line intersection listing (three sets) in terms of Shot point numbers.
- iii. IBM compatible master file containing raw and processed navigation data, in standard UKOOA formats on high-capacity tape along with a copy of the format in DVD.

5.7 SEISMIC REFRACTION SURVEYS DEPLOYING OCEAN BOTTOM SEISMOMETERS

5.7.1 The seismic reflection and Ocean Bottom Seismometer (OBS) surveys shall be conducted simultaneously.

5.7.2 The 4-C OBS surveys shall comprise one profile of 60-75 OBS along the seismic line. The units should be capable of continuously acquiring and storing seismic data; the storage capacity of the OBS units for 2.5 months continuously. The calibration test reports as per 5.8.6 to be handed over to CSIR-NGRI prior to the data acquisition.

- 5.7.3 The Service Provider shall provide the OBS units and the ancillary equipment required for their deployment, reception, electronic recording and recovery.
- 5.7.4 The OBS units shall be deployed at locations provided by CSIR-NGRI. Estimated OBS landing location is to be provided to CSIR-NGRI.
- 5.7.5 The OBS units must be capable of recording the seismic signal from the air gun array at the maximum offset of **250 km**; and an offset shooting of 150km has to be carried out at both the ends of the profile. The charge size should be appropriate for recording the MCS data with streamer length of 12 km and OBS data upto maximum **250 km** distance.
- 5.7.6 In case of loss and/or non recording of data in two or more consecutive OBS units, a repeat shooting along the line for recording at locations with OBS loss / non recording, has to be carried out, without any additional cost to CSIR-NGRI. Loss of 10% of the total number of deployments is acceptable to NGRI.
- 5.7.7 The deliverables of the OBS surveys shall comprise but not be limited to the following:
- (i) Raw data: All digital data from the OBS recorders, organized as receiver gathers and written to external disk in SEG Y format.
 - (ii) Processed seismic data: Geometry data must be added and the OBS data transcribed to SEG Y format with appropriate information written to the headers. Data must be edited to remove dead or noisy traces.
 - (iii) Reduced travel time plots, for each OBS receiver showing the relative arrival times for the first-break and later seismic phases.

5.8 SEISMIC SURVEY WORK STANDARDS

- 5.8.1 The survey shall be conducted at a steady Vessel speed, which shall be generally between 4.5-5.0 knots expressed as speed through the water. In the presence of strong currents, modifications to the vessel speed through water may be agreed upon during the survey by the CSIR-NGRI representative and the provider in order to maintain specifications for speed over ground, shot spacing, and shot intervals.
- 5.8.2 The Vessel shall come onto the Survey Line or the Survey Line Segment (in case of a Loop or Change of Line Direction), a minimum of 1.5 times the active streamer length before the First Chargeable Shot Point (chargeable only for full-fold) in order to remove any off-line deviation from the bearing of the streamer. The First Chargeable Shot Point shall be before the beginning of the Survey Line or Survey Line Segment.
- 5.8.3 The Vessel shall continue in the direction of the Survey Line or a Survey Line Segment (in case of a Loop or Change of Line Direction), until at least 50% of all hydrophones have passed the End of Line for that Survey Line or Survey Line Segment, and the next Shot Point shall be the Last Chargeable Shot Point.

5.8.4 Where Seismic Surveying is interrupted either because of operations outside the Specifications or for any other reasons that requires a Loop, the Seismic Surveying will be resumed with a minimum overlap of 1.5 times the streamer length between the Last Chargeable Shot Point of the previous Survey Line Segment and the First Chargeable Shot Point of the next Survey Line Segment. The next shot point shall maintain full-fold.

5.8.5 During Seismic Survey, a primary and secondary GPS/DGPS system shall be operational, and Seismic Survey shall be abandoned if neither of these systems meets the Specifications.

5.8.6 Prior to the start of the survey and at intervals of 15 days or less, the following, but not limited to, tests and procedures are to be performed and the results delivered to CSIR-NGRI's representative:

- . Recording system noise test, as per system manufacturer's instructions
- . Dynamic Range Test
- . Filter Pulse Test
- . Polarity test
- . Seismic trace performance as per manufacturer's specifications
- . Skew Test
- . Cartridge Speed Test
- . Test of A/D Converter Linearity and Noise
- . Test of recording system cross feed at an input-frequency in the range of 20 to 40 Hz
- . Test of timing accuracy
- . Check of converter zero, of floating point amplifier DC offset test points and of multiplexer zero
- . Before commencement of the survey, one test cartridge shall be recorded. Deficiencies, if any, shall be corrected and verified before work begins. During the survey, complete test shall be recorded on cartridge once in a month or as specified by manufacturer and test cartridge shall be supplied to CSIR-NGRI
- . Noise test shall be recorded with lowest low cut filter both on tape and monitor record before start of line and after end of line
- . Standard instrument tests shall be carried out daily. Deficiencies must be corrected and verified before work proceeds at the Service Provider's own expense
- . Cable continuity and leakage tests shall be done as frequently as possible.

5.8.7 Work shall not *commence* on any line if:

- . The streamer tracking system is not within specification
- . More than six percent of the active traces are bad traces or with more than four adjacent bad traces or more than three bad traces in eight adjacent traces
- . Half mega ohm leakage or worse is found on any channel
- . Polarity is not correct
- . Ambient noise is not reduced to the lowest level consistent with existing sea conditions

Energy source is operating below normal operating pressure or array volume is less than 100%

Monitor Camera is not functioning

Fathometer is not functioning

. Streamer drift/feathering exceeds 10 degrees, unless authorized by CSIR-NGRI representative

. Instrument noise exceeds 3 micro volts

. On board single trace recorder is not functioning

Noise due to electrical source (e.g. 50-60 Hz, picked up from ship's generator) is present. This should be eliminated without the help of notch filter of the recording unit.

. The streamer depth data are not available for any ten (10) percent or 500 m of the active streamer length, whichever is exceeded first.

Note: Relaxation of work standards may be permitted by CSIR-NGRI's representative in exceptional environmental conditions, without sacrificing data quality.

5.8.8 Work shall not *continue* on any line if:

. More than eight percent of the traces are bad or with more than four adjacent bad traces or more than three bad traces in each eight adjacent traces.

. More than twenty percent of the depth readouts, heading compass readouts or depth

. controlling birds are not functioning.

Reduction either by more than 10% of air gun volume for more than half an hour or the operating pressure less than 2000psi

If any component of the display monitor system has not been functioning for more than one hour during active surveys

. On-board single trace recorder not functioning for 30 minutes unless authorised by CSIR-NGRI's representative onboard

. More than 2% shots cumulative are bad on any line

. The streamer depth data are not available for any twenty percent or 1000 m of the active streamer length, whichever is exceeded first.

. Streamer drift exceeds ten (10) degrees relative to line leading unless authorised by CSIR-NGRI's representative on-board

. In case reflection seismic data over a line is required to be collected on two or more segments, full foldage overlap of 1 km of contiguous segment are to be provided.

However, no additional payment for acquiring data in segments or for overlap will be made. Payment will be restricted to the total length of the line as originally envisaged/to be acquired/ planned. CSIR-NGRI's representative report shall be final.

5.8.9 The following are considered as bad shots

. Auto firing of the gun

. Firing time of guns varying by more than one millisecond

Loss of more than ten percent (10%) of array volume

Pressure drops to less than 2000psi

More than seven (7) parity errors per shot point

Loss of recording of positioning and echo sounding data

5.9 SPECIFICATIONS FOR ONBOARD DATA PROCESSING

5.9.1 Specifications for Processing of Reflection Seismic Data

5.9.1.1 For onboard quality assurance and quality control purposes, the Service Provider is required to provide the entire shipboard processing sequence in less than 12 hours of acquisition. If recording parameters for the seismic reflection system are outside the specifications, the processing system will be used to assist the CSIR-NGRI representative in deciding whether to continue or abandon Seismic Survey.

5.9.1.2 For all Seismic Survey, as a minimum, the following onboard data processing shall be performed:

- . Input raw data and reformat to internal processing format
- . Datum correction
- . Geometry definition
- . survey with minimum phase anti alias filter
- . Apply gain correction (spherical correction and exponential gain)
- . True Amplitude Recovery
- . Apply Raw Shot examination for noise sources.
- . Spatially anti-alias filter with F K – filter on shots
- . Band Pass filter/Common Depth Point (CDP)
- . Merge navigation
- . Common Mid Point (CMP) gather data
- . Velocity analysis at an interval of 4 km
- . Brute Stack for Quality Control
- . Apply NMO Trace muting
- . Stack
- . Post-stack deconvolution
- . Output to a suitable format (SEG-Y) on external hard disk
- . Amplitude balancing
- . Gain
- . Apply time-varying filter (TVF) and scaling Output hardcopy at appropriately agreed scale (A1 or wider plotter) and CMP trace interval.
- . Velocity field generation and smoothening
- . Post-stack migration with SEG-Y input TVF

Note: The real processing sequences shall be decided onboard after testing and discussions with CSIR-NGRI representative(s). Some steps could be added or subtracted so as to obtain best possible results.

5.10 Shipboard Interpretation

Preliminary shipboard interpretation of the MCS data has to be performed by experts.

5.11 DELIVERY

Unless otherwise directed by CSIR-NGRI, all geophysical and navigation data described in this section shall be delivered, transportation prepaid (if any) to:

The Director, CSIR-NGRI, Uppal Road, Hyderabad-500007, INDIA

5.12 SHUT DOWN OF OPERATIONS

CSIR-NGRI's representative may request cessation of recording operations at any time if in his opinion the Service Provider's work performance or data acquisition is not as per conditions covered by the items in this Document and subsequent agreements.

5.13 MODIFICATION OF SPECIFICATIONS

Any alteration or modification of these specifications shall be done only with the approval of CSIR-NGRI

5.14 DATA ACQUISITION

At all times while survey is underway, the Service Provider's operator shall ensure that all recorded data are readable, accurate and properly annotated with periodic checks demonstrated to CSIR-NGRI's representative and approved.

5.15 SYNCHRONIZATION OF SYSTEMS

To assure proper integration of all data, all recorders shall be keyed to the electronic programmer/controller of the seismic system, which will provide relay closure impulses at each shot point. The firing impulse must coincide with recording of navigation data: it will be keyed by the distance along track. Recording in time mode is not acceptable.

5.16 AUTHORITY OF MASTER OF VESSEL

Nothing in these work standards shall be construed as to override the authority of Master of the Vessel with respect to his responsibility for the safety of the Vessel and all survey equipment and the health and well-being of its employment.

END OF SECTION 5

DETAILS OF EQUIPMENT/PERSONNEL/EXPERIENCE

Please provide details of the following (additional details may be furnished on separate paper together with Brochures, etc.). The details shall be provided in the format supplied below, to the extent possible. However, if the space provided for any particular item is inadequate, the information may be provided as an appendix on a separate paper, and reference about the appendix may be made in the appropriate column in the format.

| No | Details |
|--|--------------------------|
| Seismic Data Acquisition | |
| A1.1 | Survey Vessel (s) |
| Name | |
| Owner | |
| No./Year of Manufacturing | |
| Port of Registry | |
| Call Sign | |
| Flag | |
| Length | |
| Draft | |
| Beam | |
| Hull | |
| Tonnage Gross/Net | |
| Engine & Generators (Make, Model & Capacity) | |
| Propulsion | |
| Cruising range & Speed | |
| Fuel Capacity | |
| Water Capacity | |
| Navigation Equipment | |
| Helipad availability | |

| A1.2 | Other Vessels |
|--|----------------------|
| 1. Life-boats | |
| 2. Supply / Support vessel(s) | |
| 3. Airboats/Marsh buggies | |
| 4. Aluminium boats | |
| 5. Zodiac boats etc., if any and as necessary for the survey. Details may be furnished on separate paper | |

| A2.1 | Camera/Recording Oscillograph |
|-----------------|--------------------------------------|
| Type | |
| No. of Channels | |
| Paper width | |
| Normal Display | |

| | |
|--------------------------|-----------------------|
| A2.2 | Single Trace Recorder |
| Type | |
| Scales | |
| Input from Trace Number. | |

| | |
|-------------------------|----------------------|
| A3 | Energy Source |
| A3.1 | Air gun |
| Type of source | |
| Volume (minimum) | |
| Pressure | |
| No. of guns | |
| Depth of Guns | |
| Energy release interval | |

A4 Guaranteed latest source characteristics for field signature at 6 M depth measured through 5 Hz low cut (18 dB/octave) and 125 Hz high cut (12 dB/octave) filters.

| Volume | Working Pressure | Cycle Time | Peak to Peak Amplitude (bar-m) | Primary to Bubble ratio |
|--------|------------------|------------|--------------------------------|-------------------------|
|--------|------------------|------------|--------------------------------|-------------------------|

Please add figures showing configurations of array(s) with volumes and dimensions.
 Measured signal and amplitude spectra of arrays with all relevant information such as source and hydrophone depths, filter settings
 Description of gun synchronization system
 Description of system for controlling and monitoring gun depths
 Description of source array location system
 Description of source monitoring system (a source monitoring system must be provided to record and display the near-field signature of each sub-array).

A5 Equivalent Energy Sources
 (Principal parameters shall be indicated here and supported by literature)

For normal operations, a minimum of 50% of the streamer length spare sections should be available onboard.

| | |
|-----------|-------------------------|
| A6 | Active Group Lengths |
| | Detector type |
| | Detectors per group |
| | Group sensitivity |
| | Nearest offset |
| | Farthest offset |
| | Streamer depth |
| | No. of stretch sections |

| | |
|--|------------------------------|
| | No. of spare active sections |
| | Lead in section |

| | |
|---------------------------|-----------------------------|
| A7 | Streamer Positioning |
| A7.1 | Depth controller |
| Type | |
| Number | |
| Individually controllable | |
| Diving time | |
| A7.2 | Depth Transducers |
| Type | |
| Number | |
| Accuracy | |

| | |
|-------------------------------|---------------------------------------|
| A7.3 | Monitoring/recording |
| Water Breaks | |
| Type | |
| Number | |
| Monitoring/recording | |
| Type of tailbuoy(s) | |
| A7.4 | Method to determine feathering |
| Recording of feathering angle | |

| | |
|-----------------------------|---------------------------------|
| A8 | Recording Instrument (s) |
| Type, Model, Age | |
| No. of Channels | |
| No. of auxiliary channels | |
| Low cut filter | |
| High cut filter | |
| Cartridge format | |
| Cartridge density | |
| No. of cartridge transports | |
| Sampling rate | |
| Record length | |
| Polarity | |

| | |
|-------------|--------------------------------|
| A9 | Noise Monitoring System |
| Description | |

A10 Test Equipment

Oscilloscopes, multimeters, signal generators, frequency meters, fluke meters etc as required for proper operation and maintenance of equipments.

| | |
|-----------------------|-------------------|
| A11 | Hydrophone |
| Type | |
| Model | |
| Age | |
| Natural frequency | |
| Intrinsic sensitivity | |
| Frequency range | |

Band width of frequency of different telemetric transmitters, which will be used during the survey pre-amplifier specifications dynamic range.

- Other specifications, if any.

| | |
|------------------|--------------------------------------|
| A12 | Navigation System |
| A12.1 | Satellite Navigational System |
| Major components | |
| Type, Model, Age | |
| Accuracy | |

| | |
|--------------|-------------------------------------|
| A12.2 | Integrated Navigation system |
| Type | |
| Model | |
| Make | |
| Age | |

| | |
|------------------------------------|--|
| A12.3 | Radio Network Set (SSB, VHF & INMARSAT, etc.) |
| No. of sets which will be deployed | |
| Make | |
| Model & Type | |
| Frequencies | |
| Bandwidth | |
| Range | |
| Radiated power | |
| Type of emission | |
| Other specifications, if any. | |

A13 Echo sounder Specifications

A14 OBS Specifications

A15 Data Logger Capability etc.

A16 Auxiliary/Other Equipment: List to be provided with specifications.

A17 List of Standby Equipment & Major Assemblies with Specifications etc.

| | |
|---|---|
| A18 | DATA PROCESSING |
| Years of experience for similar data processing and the respective clients. | |
| Computer hardware installed at the centre including plotting capability. Details regarding software packages shall also be supplied | |
| Bio-data of the geophysical & navigation -data analysts and other key personnel who will be entrusted with the job | |
| Monthly turn-around time guaranteed by the bidder for navigation and other processing outputs. | |
| A19 | Bio-Data of the Personnel who will be entrusted with the Job |
| Onboard mapping Personnel | |
| Onboard geophysical Personnel | |
| Onshore Processing Personnel | |

| | |
|---|----------------------------|
| A20 | General Information |
| Years of experience and expertise in conducting marine geophysical surveys. | |
| Countries and clients for whom similar services rendered at least during the last five years. | |
| Number of geophysical research vessels being operated and maintained by the bidder. | |

END OF ANNEXURE 'A'

FORM OF PRICE BID (To be submitted)

Tender for: Marine Multichannel and Ocean Bottom Seismic Data Acquisition for Imaging the Andaman Subduction Zone

Note

- Price bid should be submitted in separate covers in accordance with the specifications given in Section 5
- The payment will be based upon the costs quoted herein.
- Bidders should quote the rates strictly in accordance with the formats given below failing which their offer shall be rejected.
- For the purpose of computation of fees for geophysical data acquisition, the line length is defined as the product of the number of shot fired and the shot point interval.
- The data acquisition and processing rates shall be inclusive of all costs of all surveys viz., seismic reflection and refraction surveys including navigation and echo sounding.

B1 MOBILISATION

Shall include all activities required by the Contractor to meet his obligations prior to the start of the tendered work, and shall include but not be limited to the mobilization of the vessel, equipment and personnel to the survey site, calibration of the onboard equipment and other incidentals, and acceptance by CSIR-NGRI that all systems are checked and operating within the Specifications and capable and ready for the surveys. The fees for recording the far-field signature (once, before the start of the surveys) and synthetic modeling of far-field signature should be provided separately. However, the evaluation of the bids will be done on the basis of formula detailed at 3.21 of the Tender Document.

B1.1 MOBILISATION FEES

| Details | MOBILISATION FEES IN US DOLLARS / EQUIVALENT INDIAN RUPEES |
|---|---|
| <i>In Figures</i> | <i>In Words</i> |
| Mobilisation fee, including the travel days from port of mobilization* to survey area (lumpsum) | |
| * port of mobilization is Chennai | |

B2 DEMOBILISATION

Shall include all activities required by the Contractor to meet his obligations subsequent to the Last chargeable shot on the last Survey Line, and shall include, but not be limited to the demobilization of the vessel, equipment and personnel from the Survey site.

B2.1 DEMOBILISATION FEES

| Details | DEMOBILISATION FEES IN US DOLLARS / EQUIVALENT INDIAN RUPEES |
|---|--|
| <i>In Figures</i> | <i>In Words</i> |
| Demobilisation fees, including the travel days from the survey area to the port of demobilization (lumpsum) | |

B3 OPERATION FEES

Shall include all charges related to acquisition, processing and documentation of seismic reflection and refraction data as detailed in this Tender Document as well as for handing over the final products to CSIR-NGRI.

Standby charges shall be paid at the daily rate pro-rated to nearest quarter of an hour subject to the conditions of the Agreement in the document.

| Fees in US Dollars / Equivalent Indian Rupees | |
|--|-----------------|
| <i>In figures</i> | <i>In Words</i> |
| Fees per line km. of seismic reflection surveys including data acquisition, processing and interpretation onboard as per the details provided in the Tender Document | |
| Fees per deployment of OBS, including data acquisition, processing, interpretation and documentation as per the details provided in the Tender Document | |
| Fees for Special processing, interpretation and documentation of seismic data as per the details provided in the Tender Document to be carried out at CSIR-NGRI. <ul style="list-style-type: none"> a. Prestack depth migration of MCS data (lumpsum) b. Travelttime Tomography of OBS data (lumpsum) c. Preliminary Interpretation and Documentation of data (lumpsum) | |
| Fees for the G & M surveys along the entire line (lumpsum) <ul style="list-style-type: none"> d. Gravity survey e. Magnetic survey | |

| |
|--|
| Standby Charges, per day , to be quoted for one day |
| Amount payable in Indian currency in proportion to total cost in percent |
| B4 Details of the nature and extent of services to be provided by the Indian Agent/ representative of an overseas bidder on behalf of the bidder and the remuneration to be provided to him in Indian currency |
| B5. Service (plus applicable cess) |
| B6. Grand Total |

Date: Signature of the bidder
Name and full address

END OF ANNEXURE 'B(i)'

Technical Specifications

| S.L. No. | CSIR-NGRI Requirement | |
|---|--|---|
| 1 | MCS Source Specifications | Energy source Tuned Airguns |
| | | Minimum volume 10,000-12,000 Cu-in |
| | | Source depth 6-8 m |
| | | Minimum Pressure 2000 psi |
| | | Primary to Bubble Ratio > 15 |
| | | Frequency Band 5-125 Hz |
| | | Peak to Peak amplitude 13 bar-m |
| | | Far filed signature must be recorded once before beginning of the survey |
| 2 | Streamer Details | Streamer Length 10-12km |
| | | Near offset not exceeding 150 m |
| | | Streamer depth 8-10 m |
| | | Group Interval 25 m |
| | | Shot Interval 100 m |
| | | No. of channels 480 |
| | | Record length 20 sec |
| | | Sampling interval 2 ms |
| | | Recording system Digital |
| | | Cable type Digital |
| | | Recording format SEG D |
| | | Media copies) back up to external disk (2 |
| | | Polarity Digital SEG standard |
| | | Hydrophone sensitivity 10-30 $\mu\text{v}/\mu\text{b}$ |
| Feathering not exceed 10^0 | | |
| Leakage < 500 ohm- m | | |
| 5 | OBS | No of OBS ~60-75 |
| | | OBS type Hydrophone + 3component Geophone |
| | | Shooting interval 100 m |
| | | Source 10,000-12,000 Cubic inches |
| | | Sampling interval 4 ms |
| | | Record length 40s |
| | | Navigation & positioning INS All positioning is to be reference to WGS 84 and Everest datum |
| | | Accommodation |
| 6 | Ship Details : Ship should have proven performance capability during the last two years; all the 75 OBS instruments should be in the possession of the ship; should be able to provide accommodation for 4 CSIR-NGRI personnel (excluding cook); and | |

| | |
|---|--|
| | should be available for inspection by NGRI team. |
| 7 | Experience and technical expertise of the ship's personnel to be clearly stated |
| 8 | Details of availability of Expertise on Traveltime tomography and prestack depth migration |

END OF ANNEXURE 'B(ii)'

PROFORMA FOR PERFORMANCE BANK GUARANTEE
(To be stamped in accordance with Indian Stamp Act)

Bank Guarantee No. _____ Date: _____ Valid upto
_____ Amount: _____

To
The National Geophysical Research Institute
Uppal Road, Hyderabad-500007

Dear Sir,

1. In consideration of CSIR-NATIONAL GEOPHYSICAL RESEARCH INSTITUTE, having its office at Uppal Road HYDERABD – 500007 (hereinafter referred to as “CSIR-NGRI” which expression shall unless repugnant to the context or meaning thereof, include all its successors, executors, administrators and assignees) and having entered into an Agreement dated _____ (hereinafter referred to as “Contract” which expression shall include all amendments thereto) with M/s. _____ having its Head/ Registered office at _____ (hereinafter referred to as “Contractor” which expression unless repugnant to the context or meaning thereof, shall include all its successors, executors, administrators and assignees) and the Agreement having been unequivocally accepted by the Contractor resulting into a contract bearing No. _____ for (Scope of Work) _____ and the CSIR-NGRI having agreed that the Contractor shall furnish to the CSIR-NGRI a Performance Guarantee for the faithful performance of the entire Contract (including but not limited to Liquidated Damages, Guarantee Warranty, Satisfactory Installation/Commissioning/Performance of the Equipment/ Product/System/Services to the extent of 10% of the value of the Contract, i.e., US \$ _____ (in words), We _____ (Bank) _____ having its Registered office at _____ (hereinafter referred to as “BANK” which expression shall unless repugnant to the context or meaning thereof, include all its successors, administrators, executors and assignees) do hereby undertake to pay on demand to the CSIR-NGRI any money or all monies to the extent of US \$ _____ (US Dollars _____) in aggregate at any time without any demur, reservation, recourse, contest or protest and /or without any reference to the Contractor. Any such demand made by the CSIR-NGRI on the BANK shall be conclusive and binding notwithstanding any difference between the CSIR-NGRI and the Contractor or any dispute pending before any Court, Arbitrator, Tribunal or any other authority. We agree that Guarantee herein contained shall be Irrevocable and shall continue to be enforceable till it is discharged by the CSIR-NGRI in writing.

2. CSIR-NGRI shall have the fullest liberty, without affecting in any way the liability of the BANK under the Guarantee, from time to time, to extend the time for performance of the Contract by the Contractor, or vary the terms of the Contract. CSIR-NGRI shall have the

fullest liberty without affecting this Guarantee to postpone, from time to time, the exercise power vested in them or of any right which they might have against the Contractor and to exercise the same at any time in any manner and either to enforce, or to forebear to enforce, any covenants contained or implied in the Contract between the CSIR-NGRI and the Contractor or any other course or remedy or security available to the CSIR-NGRI. The BANK shall not be released of its obligations under these presents by any exercise by the CSIR-NGRI of its liberty with reference to the matters aforesaid or any of them or by reason of any other action or forbearance or other acts of omission or commission on the part of the CSIR-NGRI or any other indulgence shown by the CSIR-NGRI or by any other matter or thing whatsoever, which under law would, but for this provision, have the effect of relieving the BANK.

3. The BANK also agrees that the CSIR-NGRI at its option shall be entitled to enforce this Guarantee against the BANK as a principal debtor, in the first instance, without proceeding against Contractor & notwithstanding any security or other Guarantee that CSIR-NGRI may have in relation to the Contractors liabilities.

4. The BANK further agrees that the Guarantee herein contained shall remain in full force during the period that is taken for the performance of the Contract and it shall continue to be enforceable till all the dues of the NGRI under or by virtue of this Contract have been fully paid and its claims satisfied or discharged or till the CSIR-NGRI discharges the Guarantee in writing.

5. We further agree that as between us and CSIR-NGRI for the purpose of this Guarantee any notice given to us by the CSIR-NGRI that the money is payable by the Contractor and any amount claimed in such notice by the CSIR-NGRI shall be conclusive and binding on us notwithstanding any difference between the CSIR-NGRI and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any authority. We further agree that this Guarantee shall not be affected by any change in our Constitution or that of the Contractor. We also undertake not to revoke this Guarantee during its currency.

6. Notwithstanding anything contained hereinabove, our liability under this Guarantee is limited to US \$ _____ (US Dollars _____) in aggregate and it shall remain in full force up to and including 60 days after _____ unless extended further, from time to time, for such as may be instructed in writing by M/s. _____ on whose behalf this Guarantee has been given, in which case it shall remain in full force up to and including 60 days after the extended date. Any claim under this Guarantee must be received by us before the expiry of 60 days from _____ or before the expiry of the 60 days from the extended date, if any, if no such claim has been received by us within the 60 days after the said date/extended date, the CSIR-NGRI's right under this Guarantee will cease. However if such a claim has been received by us within and upto 60 days after the said date/extended date, all the CSIR-NGRI's rights under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

7. We further confirm that this Guarantee has been issued with the approval of the appropriate Exchange Control Authorities in _____ (if required) and that the issue of this guarantee is in order and in accordance with the Laws and Regulations in force in _____.

8. We also agree that this Guarantee shall be governed by and construed in accordance with Indian Laws.

Dated this _____ day of _____ 2016 at _____ .

Yours faithfully,

(Signature)

WITNESS No. 1

Name in full _____
(Signature with full name and Designation _____
address) (With Bank stamp)

WITNESS No. 2

(Signature with full name and address)

Attorney/Code No. _____ Date _____

Date: _____

END OF ANNEXURE 'C'

Payment

Payment will be made in 3 phases as under, through Inland Letter of Credit, which will be established through State Bank of Hyderabad, TFCPC Branch, Secunderabad 500 003.

1. Mobilization charges: After completion of Mobilization and on start of Data Acquisition.
2. Data Acquisition Charges / Processing Charges – will be paid on completion of Data acquisition and processing as per the schedule of requirement.
3. Demobilization charges: after completion of demobilization.

The details of operational of Inland Letter of Credit will be given in the resulting contract.

Taxes:

The contractor shall be responsible to pay all taxes and duties such as corporate tax, service tax, income tax, turnover tax, sales tax, excise duty, etc., leviable on them and their employees including sub-contractors, if any, under the Indian income tax laws or any other laws enacted by the Central or State Govt. on account of payments received by them under this contract. Contractor shall maintain all relevant records pertaining to the taxes and submit the same before tax or other authorities and to CSIR-NGRI as and when required.

In case of Non-residents not having office in India, Service Tax shall be deducted and paid directly by CSIR-NGRI to Government of India in Indian currencies at the prevailing rate from each invoice amount payable to Contractor for providing Services.

In case of Non-residents not having office in India, TDS shall be deducted and paid directly by CSIR-NGRI to Government of India in Indian currencies at the prevailing rate from each invoice amount payable to Contractor for providing Services.

END OF ANNEXURE 'E'

DELIVERABLES

The following Deliverables are required by CSIR-NGRI from the Contractor during the period of the Services:

F1 Daily Reports

The Daily Reports shall be in a format acceptable to CSIR-NGRI, and shall include all relevant operational, nautical and technical information for each calendar day the Vessel is engaged in providing the Services for CSIR-NGRI. The Daily Reports shall include as a minimum, the weather and sea conditions; a breakdown of all hours associated with the Vessel activities and allocation of these hours as Seismic Survey Days, Transit Days, Maintenance and Minor Repair Days, Weather Downtime Days, Other Downtime Days, In Port Days and Off-Hire Days; the distances covered during Seismic Survey, the number of sonobuoys deployed; the line numbers of lines segments covered; the total line km shot; the total chargeable line km shot., the daily production and Shot Point positioning data; the progress of the onboard data processing; details of any significant Health, Safety and Environment related occurrences; description of any problems and other items of note. The Daily Reports shall be signed each day by the Leader of the Contractor onboard and the CSIR-NGRI representative onboard who is authorized to sign, and all discrepancies shall be clearly annotated. The Daily Report along with a single tracing of onboard sections and a hard copy of the Navigation Data Print-outs shall be submitted to CSIR-NGRI once a month or at the time of each port call/crew change, whichever is earlier. Copies of Daily Reports in a format approved by CSIR-NGRI shall also be sent by Telefax everyday to CSIR-NGRI, unless weather or atmospheric conditions or radiotelephone failure prevents communication from the Vessel to the Shore, on any particular day.

F2 Quality Assurance Check Sheets

Quality Assurance Check Sheets shall be in a format acceptable to CSIR-NGRI, and shall be checked and initialed by an appropriately trained, experienced and authorized employee against all quality assurance steps as carried out by the Contractor in accordance with the Quality Assurance Manual.

F3 Operational Field Reports

The Contractor shall submit to CSIR-NGRI, five copies of Operational Field Reports including the Navigation Report, plus one copy in electronic format (Microsoft Word or Excel) in a format to be approved by CSIR-NGRI, within one month of completion of the surveys

The Operational Field Report shall contain, as a minimum, a voyage summary; a list of voyage dates and the principal personnel involved; a description of the Vessel and Equipment used including navigation systems, seismic reflection system, OBS system, copies of the Daily Reports; a daily Systems log; a parameter report which provides a detailed description of the Equipment used in the survey, operational procedures associated with the Equipment, the quality control procedures associated with the Equipment, the

parameters for that Equipment to operate within the Specifications and detailed figures illustrating the physical layout of the survey Equipment; the details of the line co-ordinates and survey sequence along the Survey Lines and Transit Lines including Vessel track plots; a line summary log detailing the relevant survey parameters for each Survey Line or Survey Line Segment; a Shot record log detailing Shot numbers and extraordinary Shot events; an Air gun operations log as detailed in the Tender Document; OBS operations log etc.

F4 Digital Data

The Contractor shall, together with the Operational Field Report submit two copies of all hard disks containing the raw and processed navigation, positioning, bathymetric, seismic and OBS data recorded and copies of the onboard and post-voyage processed data in accordance to the Specifications provided in the Tender Document.

F5 Data sets deliverables

Seismic Acquisition

1. Seismic field tapes in External hard disk and DVD – 2 copies
2. Observers log and Navigation log – 2 sets each for each line
3. Raw navigation data External hard disk and DVD – 2 copies
4. Monitors plot (each 40 SP) - 2 sets each for each line
5. Single trace plot – 2 copies for each line
6. QC Brute stack plot- 2 copies
7. Acquisition operation report which details the full acquisition geometry, specifications etc. (DVD and HC) – One copy each
8. Navigation parameter report (DVD and HC) – One copy each
9. Pre-plot and post plot maps of the area (in appropriate scale) – 2 copies

Seismic processing

1. Seismic processed data – Raw stack & migrated - (SEG-Y format) – External Hard disk and DVD -1 copy each
2. Final stack and final migrated data – DVD and external hard disk – 2 sets
3. Fully annotated 36" color plots of final stack and migrated sections – 2 sets
Vertical scale limited by 36" width of plot. For 12 sec. record length it is suggested to use 1sec - 2.5 inch. Horizontal scale 1:100 000.
4. Velocity data – DVD -2 copies
5. Processed navigation data – DVD – 2 copies
6. Processing report- HC and once copy on DVD
7. Backup of data to external disk

OBS

1. Raw data: (X, Y, Z & Horizontal components) on External Hard disk and DVD - 2 copies each
2. All digital data from the OBS recorders, organized as receiver gathers and written to External disks in SEG-Y format.-External disk and DVD – One copy
3. Geometry data must be added and the OBS data transcribed to SEG-Y format with appropriate information written to the headers. Data must be edited to

- remove dead or noisy traces. Data should be written to External Disks and DVD – 2 copies.
4. Reduced travel time plots, for each OBS receiver showing the relative arrival times for the first-break and later seismic phases. – Hard copy and on DVD -1 copy
 5. OBS Data acquisition and processing report -DVD & Hardcopy – Once copy each

Gravity and Magnetic Data

1. Two copies of the acquired gravity and magnetic data in ASCII format
2. Gravity and magnetic data processing report (2 sets)

Navigation Processing Deliverables:

1. Raw positioning and navigation data recorded on DVD.
2. Navigation Parameter and Processing report on DVD (1 No.) & hard copy (1 No.).
3. Processed navigation data in External hard disk and DVD - 1 copy each.
4. Location map (post plot) on paper, scale 1:1,000,000 (or any other scale on demand) and 1 copy in acceptable digital format on DVD.

Data interpretation

1. Unmigrated / Migrated Time and depth sections of the seismic reflection profile.
2. Gravity, Magnetic models with bathymetry and velocity models (from OBS).

END OF ANNEXURE 'F'

TENDER SUBMISSION FORM

To: THE NATIONAL GEOPHYSICAL RESEARCH INSTITUTE, HYDERABAD

- 1 Having examined the Tender Document dated -----2016 including the Service Agreement and all the Annexures for the performance of the Services tendered for, we, the undersigned, hereby offer to perform the Services in conformity with all the Conditions set out in the Tender Document.
- 2 We undertake, if our Tender is accepted, to perform the whole of the Services comprised in the Agreement within the time schedule provided and at the rates quoted by us, if found acceptable to CSIR-NGRI.
- 3 We agree to abide by this Tender for a period of 180 days from the last date fixed for receiving the same and it shall remain binding upon us and may be accepted by you at any time before the expiration of that period.
- 4 This Tender is submitted under our covering letter referencedated, and the completed documents and information required as enclosed therewith, shall be read and construed as forming part of our Tender.
- 5 This Tender with your written acceptance thereof shall constitute a binding agreement between us.
- 6 We understand that you are not bound to accept the lowest or any Tender received

Signature.....
 Name.....
 For and on behalf of

Duly authorized to sign Tenders for and on behalf of the bidder

Date:.....

END OF ANNEXURE "G"

BID SECURITY FORM (EMD)

Whereas _____ (hereinafter called the "tenderer") has submitted their offer dated _____ (date of submission of tender) for the supply of _____ (name and/or description of the goods)

(hereinafter called the tender")

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 _____ 20_____.

THE CONDITIONS OF THIS OBLIGATION ARE:

- (1) If the tenderer withdraws or amends, impairs or derogates from the Tender in any respect within the period of validity of this tender.
- (2) If the tenderer having been notified of the acceptance of his tender by the Purchaser during the period of its validity:-
 - (a) If the tenderer fails to furnish the Performance Security for the due Performance of the contract.
 - (b) Fails or refuses to accept/execute the contract.

WE undertake to pay 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 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 tender validity, and any demand in respect thereof should reach the Bank not later than the above date.

(Signature of the authorized officer of the Bank)

Name and designation _____

of the Officer

Seal, name & address of _____ the Bank