

TENDER DOCUMENT for



Marine Geophysical Surveys and processing work in the Indian Ocean

NATIONAL CENTRE FOR ANTARCTIC & OCEAN RESEARCH

(Ministry of Earth Sciences, Govt. of India)

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Tender No. **NCAOR/CLCS/Tender Document/15.35/17**

Notice Inviting of Global Tender

Director, NCAOR invites sealed tenders for Marine Geophysical Surveys and processing work comprising of 2D Multi Channel Seismic Reflection, Seismic Refraction, Gravity & Magnetic with precise positioning and echo-sounding in the Indian Ocean commencing from 15th March, 2018 from Chennai Port [India] to Chennai Port [India] under “Two Bid System”. Interested bidders can visit CPP portal (www.eprocure.gov.in/epublish/app) and NCAOR website (www.ncaor.gov.in) for detailed tender document and submit the bids on or before 1st January 2018.

SD/-
For & behalf of Director, NCAOR.

Notice Inviting Tender

Director, NCAOR invites sealed tenders for Marine Geophysical Surveys and processing work comprising of 2D Multi Channel Seismic Reflection, Seismic Refraction, Gravity & Magnetic with precise positioning and echo-sounding in the Indian Ocean under “Two Bid System” (**Cover I: Techno commercial bid and Cover II: Price Bid in separate covers within a sealed cover super-scribed with “MARINE GEOPHYSICAL SURVEYS AND PROCESSING WORK IN THE INDIAN OCEAN”**) commencing from 15th of March, 2018 as per terms and conditions prescribed as under, from Chennai Port [India] to Chennai Port [India]. The details of the tender are given below:-

1.	Tender No.	:	NCAOR/CLCS/Tender Document/15.35/2017	
2.	Description of work	:	Marine Geophysical Surveys and processing work comprising of 2D Multi Channel Seismic Reflection, Seismic Refraction, Gravity & Magnetic with precise positioning and echo-sounding in the Indian Ocean	
3.	Area of operation	:	Indian Ocean	
4.	Last date and time for submitting tender	:	Monday, 01 January 2018 at 1400 hours (IST)	
5.	Date and time of opening of bids	:	a) Techno commercial Bid	Tuesday, 02 January 2018 at 1500 hours (IST)
			b) Price bid (for technically qualified bidders)	Shall be informed later to the technically qualified bidders.
6.	Bid Bond/EMD from a Scheduled Bank in India or foreign bank having branch in India	:	Foreign bidders should submit EMD for an amount of INR 1,00,00,000/- or USD 160,000 in the form of Bank Guarantee (BG) only as per prescribed format given in Annexure-V from any Scheduled Bank in India or foreign bank having branch in India. Indian bidders can submit the above indicated EMD amount either in the form of Bank Guarantee (BG) as per prescribed format given in Annexure-V or Demand Draft (DD) drawn in favour of NCAOR payable at Goa. The Original DD/BG towards EMD should be enclosed along with the techno commercial bid and submitted to NCAOR within the bid submission date.	

			Bids received without EMD will be rejected.
7.	Bid validity	:	90 days from the last date of submission of bid.
8.	Delivery cum Performance Bank Guarantee (PBG) by the successful bidder from a Scheduled Bank in India or foreign bank having branch in India to be provided in the prescribed Proforma as per Annexure-VII.	:	<p>a. PBG Amount - 10% of total quoted value consisting of Mobilization and Demobilization Charges.</p> <p>b. PBG expiry date should be incorporated as 15 months from the date of Mobilization and claim period should be 60 days from the date of expiry of PBG.</p> <p>c. The PBG has to be provided (in the prescribed Proforma as per Annexure-VII) one month before the expiry of the bid bond.</p> <p>d. If NCAOR wishes to exercise option for extending the contract for additional surveys then the bidder shall extend the validity of Delivery cum Performance Bank Guarantee for the extended period or shall submit a fresh Delivery cum Performance Bank Guarantee 30 days before the expiry of the Delivery cum Performance Bank Guarantee of the concluding season.</p>
9.	Correspondence Address	:	<p>The Director National Centre for Antarctic & Ocean Research (NCAOR) Ministry of Earth Sciences, Govt. of India Headland Sada, Vasco-da-Gama, Goa – 403 804. (India). Email: director@ncaor.gov.in Phone: 0832 2525511/Fax: 0832-2520877</p>

The tender will be governed as per the ‘Terms and conditions of the Tender and Instructions for bid submission’ enclosed in this tender document.

Bidders are advised to submit the bid complete in all respects as per requirement of tender document clearly specifying their acceptance to all the clauses of bid evaluation criteria, terms & conditions of NCAOR and compliance to the technical specifications, mandatory requirements etc. towards the scope of work.

National Centre for Antarctic & Ocean Research

TENDER DOCUMENT
MARINE GEOPHYSICAL SURVEYS AND PROCESSING
WORK IN THE INDIAN OCEAN

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SECTION 01

INTRODUCTION

National Centre for Antarctic and Ocean Research (hereinafter referred to as NCAOR), an autonomous body under the Ministry of Earth Sciences (MoES) has been entrusted by the MoES as the nodal organization for the implementation of several national research programs, including Extended Continental Shelf Program. Under these programs, marine geophysical surveys are planned to be acquired in specified areas along Indian Continental Margin. State-of-the-art 2D multi-channel seismic data along with other geophysical investigations are designed to be conducted in these areas. The data to be acquired by these surveys are designed to support India's research programmers in the continental margin as well as for the delineation of the country's Legal Continental Shelf in accordance with the United Nations Convention on the Law of the Sea (1982).

1. SCOPE OF SERVICES

- 1.1. National Centre for Antarctic and Ocean Research, wishes to hire survey vessels with 2-D marine seismic data acquisition facility onboard for awarding the work of marine geophysical surveys in the Indian Ocean (see Figure 1 for indicative map).
- 1.2. The proposed work consists of **(I)** acquisition of deep penetration multichannel 2-D seismic reflection, refraction (deploying Ocean Bottom Seismometers [OBS]), gravity and magnetic data with precise positioning and echo sounding **(II)** preliminary onboard data processing, and **(III)** post-processing of data.
- 1.3. The primary goals of the surveys are the precise identification and depth determination of the sediment/basement interface as well as obtaining information on the type and nature of the crust (continental, oceanic or transitional) constituting the basement. Sediment thickness in the survey area is highly variable, from less than a km to as much as 5 km.
- 1.4. The deep penetration seismic reflection, refraction, gravity and magnetic data are to be collected along a series of line traverses totaling an estimated **7,000 line km**, $\pm 20\%$, at water depths between 2500 m and 5000 m. Final coordinates will be provided by NCAOR at least 15 days prior to the mobilization.
- 1.5. Based on onboard evaluation of the data generated, NCAOR may vary the line coordinates and lengths supplied to the bidder, to address better the survey objectives. 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 line traverses are expected to be within a range of $\pm 20\%$ of the estimated **7,000 line km** of surveys.
- 1.6. The OBS data acquisition program shall be conducted concurrently with the reflection surveys along few selected lines in the Indian Ocean. The final number of OBS deployments shall depend upon availability of funds, however, may not exceed 20 in number and the same will be decided by NCAOR.

- 1.7. The successful bidder must ensure that the personnel and equipment are ready to commence the survey in the designated area between **15th and 21st of March 2018** from Chennai Port, Goa, India. A written undertaking to this effect will be required before signing the Agreement.
- 1.8. The successful bidder must undertake to complete all aspects of the surveys with deliverables including data acquisition, onboard processing, post-processing, documentation and making them available to NCAOR as detailed of this Tender Document to the best satisfaction of NCAOR within one month of completion of survey.
- 1.9. The scope of services also include engagement of trained and experience personnel for handling, operating and maintaining all scientific equipment onboard the survey vessel. Bidder and their onboard team should co-operate fully with the onboard client party in following the set guidelines/protocols for the data acquisition and hence achieving the project targets.
- 1.10. After successful completion of the current phase of acquisition, NCAOR may consider extension of additional data acquisition for up to 5000 line km ($\pm 20\%$) if required, with same rate, terms and conditions on mutual agreement.
- 1.11. The bidder shall conduct precise positioning, deep seismic reflection, refraction, gravity and magnetic data acquisition, onboard preliminary data processing and final post-processing work.
- 1.12. The vessel offered in the bid cannot be changed after the closing date of the bid is over.
- 1.13. NCAOR 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 different portions of the work to separate bidders, as it deems fit, or not to make any award for any or for all of the services.

2. INVITATION FOR TENDER

Director, NCAOR invites sealed tenders for Marine Geophysical Surveys and processing work comprising of 2D Multi Channel Seismic Reflection, Seismic Refraction, Gravity & Magnetic with precise positioning and echo-sounding in the Indian Ocean under “Two Bid System” (**Cover I: Techno commercial bid and Cover II: Price Bid in separate covers within a sealed cover super-scribed with “MARINE GEOPHYSICAL SURVEYS AND PROCESSING WORK IN THE INDIAN OCEAN”**) commencing from 15th of March, 2018 as per terms and conditions prescribed as under, from Chennai Port [India] to Chennai Port [India]. The tender document complete in all respects and complying with all requirements set out in this tender document **should be received by 1400 hours (IST) on Monday, 01 January 2018** to the following address:

The Director, National Centre for Antarctic and Ocean Research,
Ministry of Earth Sciences, Govt. of India, Headland Sada, Vasco-da-Gama,
Goa – 403 804 (India), Ph: 0832-2525690, Fax: 0832-2520877

3. ELIGIBILITY CRITERIA

The following documents must be submitted along with the techno commercial bid in order to determine eligibility of the bidder:

- 3.1. The bidder should be a legal entity (enclose as **Appendix 1**).
- 3.2. The bidder's average turnover of last three years (FY 2014-15, 2015-16 and 2016-17) should be not be less than INR 20.00 crores or USD 3.1 million. Copies of the audited balance sheet and trading; and profit & loss account of the respective Financial Year should be submitted along with the techno-commercial bid (enclose as **Appendix 2**).
- 3.3. The bidder shall have extensive experience and proven competence in executing marine geophysical seismic data acquisition and processing. It is mandatory for the vessel provider to provide lists of similar work successfully executed in the last five years (calculated from the closing date of the bid) and projects currently under execution (enclose as **Appendix 3**).
- 3.4. Valid certificates - The offered vessel should possess valid certificates at the time of presenting it in sea-worthy condition to NCAOR at Port of delivery. Validity should be up to December 2018 and must be provided at least 20 days before the date of Mobilization. The following certificates should be enclosed as **Appendix 4**.
 - 3.4.1. Classification certificate
 - 3.4.2. International load line certificate
 - 3.4.3. Safety radio certificate
 - 3.4.4. Compliance certificate to carry hazardous cargo
 - 3.4.5. SM safety management certificate
 - 3.4.6. International oil pollution prevention certificate
 - 3.4.7. Compliance certificate of sewage pollution prevention
 - 3.4.8. International tonnage certificate
- 3.5. Documentary proofs meeting the technical specifications as prescribed in Annexure-III of the techno commercial bid should be enclosed as **Appendix 5**.

4. OTHER REQUIREMENTS:

- 4.1. The successful bidder 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 bidder, Ministry of External Affairs (MEA)/Ministry of Defence (MOD) and Indian Navy (ODAG) clearance, as applicable, for the vessel for conducting the seismic survey as defined in this tender document. NCAOR may assist, at its sole discretion, to offer necessary documentary support in this regard.
- 4.2. The vessel should have a doctor onboard and proper medical facility to meet the medical needs of the NCAOR personnel. The vessel preferably should have MI room for treating in-patients and adequate storage facilities for keeping medicines.

- 4.3. The vessel should have proper kitchen to cater to the requirements of NCAOR's scientific crew apart from the vessel crew. An Indian cook is to be provided to prepare and serve Indian food to NCAOR's crew.
- 4.4. The vessel should have an office room equipped with PC, printer and photocopier for the use of NCAOR personnel. Necessary office stationeries also to be provided.

Interested bidders may submit their information containing details on following:

Acquisition	Processing
1. Lists of similar work successfully executed in the last five years and projects currently under execution.	Lists of similar marine geophysical surveys including seismic reflection and refraction data acquisition and processing work successfully executed in the last five years and projects currently under execution. Technology available to attenuate water bottom multiples and full processing up to final stack and time migration.
2. Personnel details including bio-data of key personnel.	Personnel details including bio-data of key personnel.
3. Equipment listings and vessel availability details.	Available software and hardware details.
4. Company and management structure together with logistic support details.	QA/QC procedure (internal and remote) details.
5. Acquisition methodology.	Details of processing flow (PSTM & PSDM) & description of project deliverables.
6. Lists of policies, procedures and quality assurance practices currently in place for the execution of similar work.	
7. Health, Safety and Environment policies, procedures and statistics covering the last five years.	
8. Corporate financial details.	
9. Details of legal / court rulings against your company, if any in last five years	

5. PRICING

- 5.1. Pricing must be reflected to include different components as per the **enclosed price bid format** at the end of this document (given as Annexure-VI). Bidders must submit quotes against all columns mentioned in the price bid format.
- 5.2. 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, processing of acquired geophysical data, and the

accommodation and victual charges of personnel representing NCAOR onboard the vessel during the surveys, as specified.

- 5.3. All port calls, pilotage and harbour dues, shall be borne by the bidder. 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.

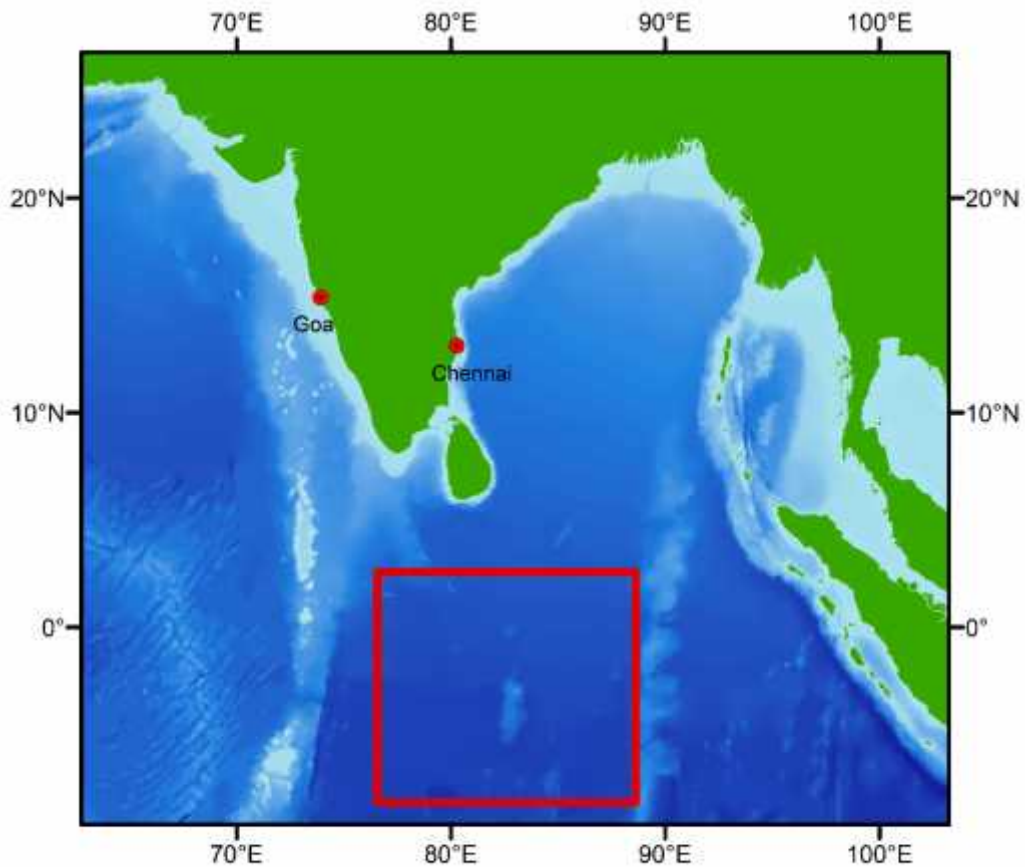


Fig 1: Indicative map of survey area

SECTION 02 SPECIFICATIONS OF SURVEY

1. INTRODUCTION

This section provides specifications for what will be required for conducting marine geophysical surveys in the Indian Ocean. The data to be acquired by these surveys are designed to support India's research programmes as well as for the delineation of the country's Legal Continental Shelf.

- 1.1. The proposed work consists of **(I)** acquisition of deep penetration multichannel 2-D seismic reflection, refraction (deploying Ocean Bottom Seismometers [OBS]), gravity and magnetic data with precise positioning and echo sounding **(II)** preliminary onboard data processing, and **(III)** post-processing of data.
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- 1.6. The successful bidder must undertake to complete all aspects of the surveys with deliverables including data acquisition, onboard processing, post-processing, documentation and making them available to NCAOR as detailed of this Tender Document to the best satisfaction of NCAOR within one month of completion of survey.
- 1.7. The scope of services also include engagement of trained and experience personnel for handling, operating and maintaining all scientific equipment onboard the survey vessel. Bidder and their onboard team should co-operate fully with the

onboard client party in following the set guidelines/protocols for the data acquisition and hence achieving the project targets.

- 1.8. The bidder shall conduct precise positioning, deep seismic reflection, refraction, gravity and magnetic data acquisition, onboard preliminary data processing and final post-processing work.
- 1.9. The successful bidder shall undertake to provide (including but not limited to) all materials, labour, expenses, consumables, fuel, lubricants, and data media, such as paper, CDs, DVDs, external hard diskettes, as may be required for the performance of the Services; undertake the responsibility of deleting / erasing / handing over to NCAOR all the products of the acquired, processing and interpretation of the geophysical data 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 NCAOR.
- 1.10. The successful bidder undertakes to deliver, upon the completion of the work, all originals and copies of maps, charts, documents, reports, and data provided by NCAOR or acquired/generated by the bidder 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 secure manner to NCAOR; and undertakes to provide all the deliverables as provided in this Tender Document within the time schedule provided.
- 1.11. The bidder takes full responsibility for the removal and appropriate disposal of any wreck or debris of the vessel(s) or any part thereof.
- 1.12. The bidder 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.
- 1.13. The bidder 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 NCAOR participating in the vessel for data acquisition as may be required for providing the Services, whenever such clearances are necessary.
- 1.14. The bidder undertakes to re-export all equipment, spares and consumables that were imported into India but were not consumed for providing the services under this tender document, 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.
- 1.15. The bidder undertakes to bear all costs and delays arising out of any breakdown, industrial action and any other contingency. If the bidder breaches any of its obligations under this clause, the bidder shall remedy, at its own cost, any defect, which includes any failure to meet the required standard(s), to the NCAOR's satisfaction and within such time as may be specified by NCAOR.

2. RESEARCH VESSEL REQUIREMENTS

Preferred specifications of the vessel and its scientific instruments are as below:

Type :	Marine Geophysical Surveys and processing work comprising of 2D Multi Channel Seismic Reflection, Seismic Refraction, Gravity & Magnetic with precise positioning and echo-sounding
Endurance :	Around 30 to 35 days
General Sailing Speed :	10-12 knots
Accommodation :	Maximum 05 NCAOR representatives (besides the vessel crew and bidder's scientific & technical crew)

3. DETAILS OF MULTI-CHANNEL SEISMIC (MCS) ACQUISITION COMPONENTS

3.1. Recording System Specifications

- 3.1.1. The bidder shall keep detailed system log sheets. The log shall include, but 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.
- 3.1.2. A streamer-source diagram shall be prepared for each Survey Line or Survey Line Segment. The diagram will show airgun 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.
- 3.1.3. 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 data in a format acceptable to NCAOR 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.

4. DATA LOGGING

- 4.1. Recording of data should be done by the state-of-the-art system, which should be of industry standard.
- 4.2. Recording tape/Hard Disk speed shall be maintained within the manufacturer's specifications.

- 4.3. Tape heads shall be cleaned between each production tape prior to loading or as required by the manufacturer.
- 4.4. At the completion of each survey line or part thereof, one record, excluding noise files, from those recorded on each tape/disk transport shall be played back on a different transport to that on which it was originally recorded.
- 4.5. These playbacks shall be made of records for which monitors have been made during recording.
- 4.6. It shall be possible to read any tape on any transport, regardless of which transport was originally used to record it.
- 4.7. Proper precautions shall be observed in recording, sealing, storing and transporting both new and recorded disks.
- 4.8. The Bidder will warrant that all disks prepared by the Bidder in performance of the work and/or services under this contract shall be in conformance to the requirements of NCAOR.
- 4.9. During the Seismic Surveying two copies of the digital seismic data in SEG-Y format shall be recorded and provided on Hard Disks. High quality hard disks should be chosen for data longevity and should be in a form as approved by NCAOR.
- 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.
- 4.11. The Bidder shall provide the following output on high quality hard disks in a format designated by NCAOR:
 - 4.11.1. Raw data of navigation as well as seismic surveys carried out.
 - 4.11.2. Processed seismic data in (a) 2.5 inches/sec vertical scale, one set of film and two sets of ammonia prints of final stacked data (about 35 tpi); (b) 5.0 inches/sec vertical scale, one set of film and one set of ammonia print of final stacked data (unmigrated, about 35 tpi); (c) 2.5 inches/sec vertical scale, one set of film and two sets of ammonia prints of final migrated data (about 35 tpi); and (d) 5.0 inches/sec vertical scale, one set of film and two sets of ammonia prints, of final migrated data (about 35 tpi).

5. POLARITY

- 5.1. 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/disk and deflects galvanometers downward to produce wavelet minima (white) troughs on monitors. This shall be checked to NCAOR's satisfaction prior to the Mobilisation.
- 5.2. All seismic channels shall be recorded and processed with identical polarity. Polarity on magnetic tape/disk recording, read after write playbacks and multi-channel monitors will be identical.
- 5.3. Polarity shall be checked and confirmed immediately after any instrument or streamer maintenance or at such other times as the NCAOR Representative reasonably requests.
- 5.4. 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.

6. ENERGY SOURCE SPECIFICATIONS

Energy Source:	Tuned Air Gun array
Minimum volume:	5000 cu. inches or higher
Minimum pressure:	2000 psi
Primary to Bubble ratio:	15:1 or better
Frequency band:	5-100 Hz

- 6.1. The air pressure in the lines to the air guns immediately prior to shot firing shall be nominally 2000 psi, or not less than 90% of the nominal specified pressure.
- 6.2. Farfield signature must be recorded once before beginning of the survey.
- 6.3. The interval between Shot points shall be fixed and Shots shall be triggered by GPS/DGPS positioning at intervals of 50 m on a geoid surface, in distance mode.
- 6.4. The airgun shall be towed within the following parameters during the surveys:
 - 6.4.1. In the depth range of 5-10 m
 - 6.4.2. Maintained within one m of the specified nominal value
 - 6.4.3. Maximum variation of towing depth of any gun within the array is 1.5 m between extremes

7. SEISMIC SIGNAL SYSTEM

Streamer length:	6000 m or greater
Near Offset:	Not exceeding 150 m
Group Interval:	25 m
Shot Interval:	50 m
No. of Channels:	240
Sampling Interval:	2 ms
Record Length:	16 sec
Notch:	as required
Low cut:	3 Hz/cut
High cut:	Consistent with antialias filter
Cable type:	Digital
Recording System:	Digital
Recording Format:	SEG-Y
Media:	Hard Disks
Polarity:	SEG standard

8. DIGITAL STREAMER

- 8.1. Should have minimum of 15 hydrophones per group.
- 8.2. Hydrophone sensitivity: 6-30 $\mu\text{v}/\mu\text{b}$ or better.
- 8.3. Depth detectors shall be positioned at an interval of 200-300 m along the length of the cable.
- 8.4. Streamer shall be towed at a depth of 10-20 m. The depth should be maintained with an accuracy of 10%.
- 8.5. Feathering shall not exceed 10 degrees.

- 8.6. Near 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 near-offset distance shall be as short as possible and shall not exceed 150 m.
- 8.7. 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.
- 8.8. Leakage: Less than 500 ohm-m.
- 8.9. Dead/Leaky channel: shall not be more than four when data is being acquired.

9. NAVIGATION AND POSITIONING

9.1. Primary Navigation:

- 9.1.1. Global Positioning System (GPS) or Differential Global Positioning System (DGPS) capable of providing accurate position in the survey area.
- 9.1.2. Accuracy: Maximum possible accuracy with state of the art DGPS/GPS (at least within 25 m of desired location).
- 9.1.3. 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).

9.2. Integrated Navigations System (INS):

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.

9.3. Work standards for navigation and positioning:

- 9.3.1. All positioning is to be referenced to WGS 84 Datum, using the datum transformation parameters to be provided by the Bidder.
- 9.3.2. All survey work is to be undertaken using Latitude and Longitude in terms of WGS 84.
- 9.3.3. All positioning is to be obtained 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 25 m of the intended location.
- 9.3.4. 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.

- 9.3.5. 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.
- 9.3.6. 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.
- 9.3.7. Processing of navigation data shall be carried out by the Bidder as per standard practice in the industry, at no extra cost to NCAOR.
- 9.3.8. The following output shall be supplied to NCAOR at no extra cost:
 - The print of post plots (three sets) along with original film in four different and suitable scales.
 - Line intersection listing (three sets) in terms of Shot point numbers
 - IBM compatible master file containing raw and processed navigation data, in standard UKOOA format on high quality hard disk along with a copy of the format.

10. SEISMIC REFRACTION SURVEYS DEPLOYING OCEAN BOTTOM SEISMOMETERS (OBS)

The seismic refraction using Ocean Bottom Seismometer (OBS) (multi-component – x, y, z and h) may be conducted concurrently (*active mode*) with multi-channel reflection surveys.

- 10.1. The Ocean Bottom Seismometer (OBS) surveys shall comprise one or more profiles with a maximum of twenty (20) OBS deployments using active source. The units should be capable of continuously acquiring and storing seismic data for a period of up to 20 days.
- 10.2. The Bidder shall provide the OBS units and the ancillary equipment required for their deployment, reception, electronic recording and recovery.
- 10.3. The OBS units shall be deployed where requested by the NCAOR representative (s) onboard.
- 10.4. The OBS units must be capable of recording the seismic signal from the airgun array at a range of at least 80 km. Offset and proposed depth of target to be studied is around 30-50 km.
- 10.5. The deliverables of the OBS surveys shall comprise but not be limited to the following:
 - 10.5.1.1. Raw data: All digital data from the OBS recorders, organized as receiver gathers and written to hard disks in SEG-Y format.

- 10.5.1.2. 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.
- 10.5.1.3. Reduced travel time plots, for each OBS receiver showing the relative arrival times for the first-break and later seismic phases.
- 10.5.1.4. A crustal wave speed model along each profile, which satisfies the arrival times of the seismic phases to within the estimated observation error of the seismic phase.

11. SEISMIC SURVEY WORK STANDARDS

- 11.1. 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.
- 11.2. 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.
- 11.3. 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.
- 11.4. 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.
- 11.5. During Seismic Surveying a primary and secondary GPS/DGPS system shall be operational, and Seismic Surveying shall be abandoned if neither of these systems meets the Specifications.
- 11.6. 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 NCAOR's representative:
 - 11.6.1. Recording system noise test, as per system manufacturer's instructions
 - 11.6.2. Dynamic Range Test
 - 11.6.3. Filter Pulse Test
 - 11.6.4. Polarity test
 - 11.6.5. Seismic trace performance as per manufacturer's specifications
 - 11.6.6. Skew Test
 - 11.6.7. Cartridge Speed Test
 - 11.6.8. Test of A/D Converter Linearity and Noise
 - 11.6.9. Test of recording system cross feed at an input-frequency in the range of 20 to 40Hz
 - 11.6.10. Test of timing accuracy

- 11.6.11. Check of converter zero, of floating point amplifier DC offset test points and of multiplexer zero
- 11.6.12. 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 NCAOR
- 11.6.13. Noise test shall be recorded with lowest low cut filter both on tape/disk and monitor record before start of line and after end of line
- 11.6.14. Standard instrument tests shall be carried out daily. Deficiencies must be corrected and verified before work proceeds at the Bidder's own expense
- 11.6.15. Cable continuity and leakage tests shall be done as frequently as possible.

12. WORK SHALL NOT COMMENCE ON ANY LINE IF:

- 12.1. The streamer tracking system is not within specification.
- 12.2. 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.
- 12.3. Half mega ohm leakage or worse is found on any channel
- 12.4. Polarity is not correct
- 12.5. Ambient noise is not reduced to the lowest level consistent with existing sea conditions
- 12.6. Energy source is operating below normal operating pressure or array volume is less than 100%
- 12.7. Monitor Camera is not functioning
- 12.8. Fathometer is not functioning
- 12.9. Streamer drift exceeds 10 degrees, unless authorized by NCAOR representative
- 12.10. Instrument noise exceeds 3 microvolts
- 12.11. On board single trace recorder is not functioning
- 12.12. 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.
- 12.13. 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 NCAOR's representative in exceptional environmental conditions, without compromising data quality.

13. WORK SHALL NOT CONTINUE ON ANY LINE IF:

- 13.1. More than eight percent of the traces are bad or with more than four adjacent bad traces or more than three bad traces in eight adjacent traces.
- 13.2. More than twenty percent of the depth readouts, heading compass readouts or depth controlling birds are not functioning.

- 13.3. Reduction by more than 10% of either volume or normal operating pressure of air gun system for more than half an hour or dropping of either volume or normal operating pressure of air gun system by 20% or more.
- 13.4. If any component of the display monitor system has not been functioning for more than one hour during active surveys
- 13.5. On-board single trace recorder not functioning for 30 minutes unless authorized by NCAOR's representative onboard
- 13.6. More than 2% shots cumulative are bad on any line
- 13.7. The streamer depth data are not available for any twenty percent or 1000 m of the active streamer length, whichever is exceeded first.
- 13.8. Streamer drift exceeds ten (10) degrees relative to line leading unless authorized by NCAOR's representative on-board.
- 13.9. 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. NCAOR's representative report shall be final.

14. THE FOLLOWING ARE CONSIDERED AS BAD SHOTS

- 14.1. Auto firing of the gun
- 14.2. Firing time of guns varying by more than one millisecond
- 14.3. Loss of more than twenty percent (20%) of array volume
- 14.4. Pressure drop of more than ten (10) percent of normal operating
- 14.5. More than seven (7) parity errors per shot point
- 14.6. Loss of recording of positioning and echo sounding data

15. MARINE MAGNETIC SURVEYS

- 15.1. The Magnetometer shall be a Marine Proton Precession Magnetometer with accuracy and channels of at least 0.1 nT and 2 respectively. The measuring cycle may be 1-10 sec.
- 15.2. The magnetometer sensor shall be towed at a position approximately two to three times the vessels length behind the vessel. This distance shall be recorded on all data forms.
- 15.3. The positional accuracy of the magnetic data are to be relative to the position of the vessel Datum Point.
- 15.4. Magnetic data shall be digitally recorded on data cartridges. It will also be recorded on strip chart for control purpose only.
- 15.5. Strip charts shall be clearly marked at every 40th pop showing total intensity in gammas/nT, day, time, shot point and line numbers.
- 15.6. Total intensity value shall be recorded on strip chart at each switch back.

- 15.7. Inoperability of the Magnetometer system shall not be a cause to delay in commencing or to suspend seismic and gravity operations on any line/time.
- 15.8. When possible, the magnetometer shall be operated while changing lines at no extra cost to NCAOR.
- 15.9. Routine checks and calibration should be carried out as specified by the manufacturers and to the satisfaction of NCAOR representative.
- 15.10. **Specifications of the Magnetometer:**
 - 15.10.1. Range: Standard range with overlapping manually selectable switch positions (20000-90000 nT)
 - 15.10.2. Sampling Interval: User's selectable at the minimum of one second every shot point
 - 15.10.3. Sensor Cable Length: Approx. 500m (sufficient to tow the sensor behind the vessel at a distance beyond the ship's magnetic effect)
 - 15.10.4. Analog recording with two simultaneous channels with 1% of full-scale resolution on archival recording papers to be simultaneously recorded on tape/cartridge
 - 15.10.5. Output to INS data logger for each shot point data
 - 15.10.6. On-line digital display of measured magnetic data

16. MARINE GRAVITY SURVEYS

- 16.1. The gravimeter shall be similar to a latest model La Coste Romberg Air-Sea established platform gravimeter. The periods of the L&R platform shall be set at 4 minutes or synchronized with the shooting system.
- 16.2. All the calibration tests shall be carried out at every port call.
- 16.3. Total gravity field measurements shall be continuously measured during the survey and recorded digitally on data cartridge. It shall also be recorded analog on a rectilinear chart paper for control purpose only.
- 16.4. The positional accuracy of the gravity readings is to be relative to the position of the Vessel datum point.
- 16.5. Gravity base station readings must be made at every port call, and immediately prior to mobilization and after demobilization.
- 16.6. Reading of gravity meter should be tied to at least one Jetty in India where absolute gravity is known. The location of the Vessel at dock shall clearly be documented.
- 16.7. The gravimeter shall be maintained at constant temperature during the entire duration of the survey, likewise during port calls or at anchor.
- 16.8. Strip charts shall be clearly marked at every 40th pop showing gravity value, spring tension, day, time, shot point and line nos.
- 16.9. Failure of the gravity meter system shall not be a cause to delay commencing or to suspend seismic and magnetic-recording operations on any line/time.
- 16.10. **Specifications of the Gravimeter:**
 - 16.10.1. Accuracy: 0.01 mGal
 - 16.10.2. Accuracy for the reduced gravity: 1.0 mGal
 - 16.10.3. Drift: 2.0 to 3.0 mGal /month

- 16.10.4. Sampling Interval: User selectable at the minimum of 1 sec.
- 16.10.5. Measuring Range: More than 12000 mGal
- 16.10.6. Output to INS data logger for each shot point data
- 16.10.7. Provision for recording the observed gravity time data on the hard disk & tape/cartridge
- 16.10.8. Analog recording on archival chart paper

17. SPECIFICATIONS FOR ONBOARD DATA PROCESSING

- 17.1. Specifications for Processing of Reflection Seismic Data - 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 NCAOR representative in deciding whether to continue or abandon Seismic Survey. For all Seismic Survey, as a minimum, the following onboard data processing shall be performed:
 - 17.1.1. Input raw data and reformat to internal processing format
 - 17.1.2. Datum correction
 - 17.1.3. Geometry definition
 - 17.1.4. Apply gain correction (spherical correction and exponential gain)
 - 17.1.5. Apply Raw Shot examination for noise sources.
 - 17.1.6. Spatially anti-alias filter with 1, 2, 1 K – filter on shots
 - 17.1.7. Band pass filter/Common Depth Point (CDP)
 - 17.1.8. Common Mid-Point (CMP) gather data
 - 17.1.9. Preliminary velocity analysis at 2 km interval
 - 17.1.10. Multiple suppression
 - 17.1.11. Brute Stack for Quality Control
 - 17.1.12. Amplitude balancing
 - 17.1.13. Final shipboard velocity analysis at 2 km interval
 - 17.1.14. Apply NMO Trace muting
 - 17.1.15. Amplitude balancing
 - 17.1.16. Stack
 - 17.1.17. Post-stack deconvolution
 - 17.1.18. Output to a suitable format (SEG-Y) on hard disks
 - 17.1.19. Amplitude balancing
 - 17.1.20. Gain
 - 17.1.21. Apply time-varying filter (TVF) and scaling
 - 17.1.22. Output hardcopy at appropriately agreed scale (A1 or wider plotter) and CMP trace interval on hard disks
 - 17.1.23. Velocity field generation and smoothening
 - 17.1.24. Post-stack migration with SEG-Y input TVF

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

17.2. Pre-stack Inversion: Full waveform pre-stack inversion at some locations may be needed to validate the accuracy of the MCS reflection velocities. The bidder may provide the requisite documentation in this regard as it relates to the methodology of inversion for obtaining such deliverables as the velocity, density, Poisson's Ratio and thickness for each layer up to the bottom-most reflector, including the error estimates.

18. SPECIFICATIONS FOR PROCESSING OF GRAVITY AND MAGNETIC DATA

- 18.1. Appropriate step-back correction will be applied to both gravity and magnetic data so that the processed data is referenced to shot point whose precise coordinates are known.
- 18.2. In case Gravity, magnetic data is not retrievable/recorded in magnetic/on board storage devices then Bidder shall extract the data from strip/Fathometer chart without any additional cost to NCAOR.
- 18.3. The recorded gravity data should be tied to at least one Indian jetty to reduce the observed gravity to absolute gravity.
- 18.4. Appropriate Etvos correction to be applied to the gravity data so that no correlation is observed between measured gravity & speed of the ship. This should be shown as a quality control parameter to NCAOR.
- 18.5. IGRF correction, using latest IGRF/DGRF model, should be applied on magnetic data.
- 18.6. Diurnal correction should be applied on the magnetic data if the diurnal data is made available by NCAOR from the nearest observatory.
- 18.7. After calculating Magnetic Anomaly, Free air Anomaly & Bouguer anomaly the data may be subjected to high cut filter to eliminate the remnants of acquisition error. However both the filtered & unfiltered data are to be supplied to NCAOR.
- 18.8. Network adjustments are to be done, if data on intersecting lines are available.

Following Final Plots are to be provided to NCAOR

Ñ Plots of free air anomaly, Bouguer anomaly, Magnetic anomaly with annotations of shot points and horizontal & vertical scale. At least two sets of plots on film and three sets of ammonia print are to be provided to NCAOR.

Ñ The final processed data, containing raw gravity, raw magnetic, velocity of the ship (both speed & heading), free air anomaly, Bouguer anomaly, magnetic anomaly (values of all the three anomalies before filtering, after filtering, and after network adjustment), are to be provided on some storage devices which will be decided by NCAOR.

19. DELIVERY

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

The Director, National Centre for Antarctic & Ocean Research (NCAOR)
Ministry of Earth Sciences, Govt. of India, Headland Sada, Vasco-da-Gama,
Goa – 403 804. (India). Email: director@ncaor.gov.in, Phone: 0832 2525511

20. DETAILS OF EQUIPMENT

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 of Seismic Data Acquisition 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	
	Endurance	
	Fuel Capacity	
	Water Capacity	
	Navigation Equipment	
	Helipad availability	

No.	Other Vessels	
	Life-boats	
	Supply/ Support vessel (s)	

	Airboats/Marsh buggies	
	Aluminum boats	
	Zodiac boats etc., if any and as necessary for the survey. Details may be furnished on separate paper	

	Onboard Displays

	Camera/Recording Oscillograph	
	Type	
	No. of Channels	
	Paper width	
	Normal Display	
	Single Trace Recorder	
	Type	
	Scales	
	Input from Trace Number	

	Energy Source	
	Air Gun	
	Type of Source	
	Volume (minimum) : 5000 cu. inches	
	Pressure: 2000 psi	
	No. of Guns	
	Depth of Guns	
	Energy release interval	
	Primary to Bubble ratio: 15:1 or better	
	Frequency (5-100 Hz)	

Guaranteed latest source characteristics for field signature at 6 m depth measured through 08 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

1. Please add figures showing configurations of array(s) with volumes and dimensions.
2. Measured signal and amplitude spectra of arrays with all relevant information such as source and hydrophone depths, filter settings
3. Description of gun synchronization system

4. Description of system for controlling and monitoring gun depths
5. Description of source array location system
6. Description of source monitoring system (a source monitoring system must be provided to record and display the near-field signature of each sub-array).

Equivalent Energy Sources

(Principal parameters shall be indicated here and supported by literature)

	Digital Streamer	
	Number of streamers with Lengths	
	Type of streamer(s) and age	
	Skin material	
	Groups per streamer	
	Available Group Interval	
	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	

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

	Streamer Positioning	
	Depth controller	
	Type	
	Number	
	Individually controllable	
	Diving time	
	Depth Transducers	
	Type	
	Number	
	Accuracy	
	Monitoring/recording	
	Water Breaks	
	Type	
	Number	
	Monitoring/recording	

	Type of tailbuoy (s)	
	Method to determine feathering	
	Recording of feathering angle	
	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	

	Noise Monitoring System	
	Description	

Test Equipment

Oscilloscopes, multi-meters, signal generators, frequency meters, fluke meters etc. as required for proper operation and maintenance of equipment

	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.

	Navigation System	
	Satellite Navigational System	
	Major components	
	Type, Model, Age	
	Accuracy	

	Integrated Navigation system	
	Type	
	Model	
	Make	
	Age	
	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.	

Also provide details for:

- Echosounder specifications
- Gravimeter specifications
- Magnetometer specifications
- OBS specifications
- Data Logger capability etc.
- Auxiliary/other equipment: list to be provided with specifications
- List of stand-by equipment and major assemblies with specifications

21. DELIVERABLES

The following deliverables are required by NCAOR from the bidder during the period of the services:

21.1. Daily Reports

The Daily Reports shall be in a format acceptable to NCAOR, and shall include all relevant operational, nautical and technical information for each calendar day the Vessel is engaged in providing the Services for NCAOR. 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 OBS 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 NCAOR 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 NCAOR 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 NCAOR shall also be sent by Telefax every day to NCAOR, unless weather or atmospheric conditions or radio telephone failure prevents communication from the Vessel to the Shore, on any particular day.

21.2. Quality Assurance Check Sheets

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

21.3. Operational Field Reports

The bidder shall submit to NCAOR, 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 NCAOR, within one month of completion of the surveys. The Operational Field Report shall contain, as a minimum, a voyage summary; Vessel and Equipment used including navigation systems, seismic reflection system, sonobuoy 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 coordinates 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; sonobuoy operations log etc.

21.4. Digital Data

The bidder shall, together with the Operational Field Report submit two copies of all disks containing the raw and processed navigation, positioning, 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. All the media

types used for various data acquisition in the course of the work carried out in the cruise(s) shall be handed over to NCAOR before cruise completion.

21.5. **Dataset Deliverables**

21.5.1.1. **Seismic acquisition**

- 21.5.1.2. Seismic field (on hard disks) – 2 copies
- 21.5.1.3. Observers log and Navigation log – 2 sets each for each line
- 21.5.1.4. Raw navigation data (on hard disks) – 2 copies
- 21.5.1.5. Monitors plot (each 40 SP) - 2 sets each for each line
- 21.5.1.6. Single trace plot – 2 copies for each line
- 21.5.1.7. QC Brute stack plot- 2 copies
- 21.5.1.8. Acquisition operation report which details the full acquisition geometry, specifications etc. (CD/hard disk and hard copy) – One copy each
- 21.5.1.9. Navigation parameter report (CD/hard disk and hard copy) – One copy each
- 21.5.1.10. Pre-plot and post plot maps of the area (in appropriate scale) – 2 copies

21.5.2. **Seismic processing**

- 21.5.2.1. Seismic processed data – Raw stack & migrated - (SEG-Y format) – hard disk – 2 sets each
- 21.5.2.2. Final stack and final migrated data – hard disk – 2 sets each
Fully annotated 36 color plots of final stack and migrated sections – 2 sets vertical scale limited by 36 width of plot. For 16 sec record length it is suggested to use 1 sec - 2 inch. Horizontal scale 1:100000.
- 21.5.2.3. Velocity data – Hard disks – 2 sets
- 21.5.2.4. Processed navigation data – hard disks – 2 sets
- 21.5.2.5. Processing report- hard copy and hard disk – 1 set
- 21.5.2.6. Backup of data to hard disks

21.5.3. **OBS**

- 21.5.3.1. Raw data: (X, Y, Z & Hydrophone components) on hard disks - 2 sets each
- 21.5.3.2. All digital data from the OBS recorders, organized as receiver gathers and written in SEG-Y format - hard disks – 2 sets each
- 21.5.3.3. 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 – 2 sets each

- 21.5.3.4. Reduced travel time plots, for each OBS receiver showing the relative arrival times for the first-break and later seismic phases. –hard disks - 2 sets each
- 21.5.3.5. OBS Data acquisition and processing report - hard disks – 1 set each

- 21.5.4. **Navigation processing deliverables**
 - 21.5.4.1. Raw positioning and navigation data recorded on tape as well as hard disk in UKOOA P2/94 format
 - 21.5.4.2. Navigation Parameter and Processing report in hard disk & hard copy
 - 21.5.4.3. Processed navigation data in P1/90 format on hard disk – 1 copy each
 - 21.5.4.4. 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 hard disk

- 21.5.5. **Gravity and Magnetic deliverables**
 - 21.5.5.1. Plots of free air anomaly, Bouguer anomaly, Magnetic anomaly with annotations of shot points and horizontal & vertical scale. At least two sets of plots on film and three sets of ammonia print are to be provided to NCAOR.
 - 21.5.5.2. The final processed data, containing raw gravity, raw magnetic, velocity of the ship (both speed & heading), free air anomaly, Bouguer anomaly, magnetic anomaly (values of all the three anomalies before filtering, after filtering, and after network adjustment), are to be provided on some storage devices which will be decided by NCAOR.

SECTION 03

TERMS AND CONDITIONS OF THE TENDER AND INSTRUCTIONS FOR BID SUBMISSION

Director, NCAOR invites sealed tenders for Marine Geophysical Surveys and processing work comprising of 2D Multi Channel Seismic Reflection, Seismic Refraction, Gravity & Magnetic with precise positioning and echo-sounding in the Indian Ocean under “Two Bid System” (**Cover I: Techno commercial bid and Cover II: Price Bid in separate covers within a sealed cover super-scribed with “MARINE GEOPHYSICAL SURVEYS AND PROCESSING WORK IN THE INDIAN OCEAN”**) commencing from 15th of March, 2018 as per terms and conditions prescribed as under, from Chennai Port [India] to Chennai Port [India].

The bidders are required to submit their bids to Director, NCAOR and dropped in the designated tender box kept at NCAOR, Goa on or before the last date of tender submission. Instructions for bid submission are given below:

1. SEARCHING FOR TENDER DOCUMENTS

- 1.1. There are various search options built in CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, date, other keywords etc. to search for a tender published on the CPP Portal.
- 1.2. Once the bidders have selected the tenders they are interested in, they may download the requirement documents/tender schedules.
- 1.3. Preparation of bids:
 - 1.3.1. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
 - 1.3.2. Please go through the tender advertisement and the tender document carefully to understand these documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents-including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
 - 1.3.3. An authorized letter needs to be brought for any pre bid meeting.

2. INSTRUCTIONS TO BIDDERS

- 2.1. Bidders are advised to go through the Notice Inviting Tender (NIT), Bid Evaluation Criteria and Bid documents before submission of bids.

- 2.2. Bidders must ensure that all documents including the supporting technical literature are submitted in English language.
- 2.3. Ensure that the bids are submitted under the “*Two Bid System*” (Cover-I: Techno commercial Bid and Cover-II: Price Bid) failing which offer will be rejected.
- 2.4. ***Techno commercial bid (Cover I)*** should contain the following:
 - 2.4.1. Tender Acceptance Form as per Annexure-I duly endorsed in acceptance.
 - 2.4.2. Compliance Statement duly endorsed in acceptance as per Annexure-II.
 - 2.4.3. Criteria for Technical Evaluation duly endorsed in acceptance as per Annexure-III.
 - 2.4.4. Details of Bidder Annexure-IV.
 - 2.4.5. Proforma for Bid Bond/EMD of requisite value and validity as per Annexure-V.
 - 2.4.6. The unpriced bid in the given format (Annexure VI) indicating all contents excluding prices to be enclosed. Disclosure of any prices in the unpriced bid shall be liable for rejection.
 - 2.4.7. Any other technical information considered necessary.
 - 2.4.8. All supporting documents to substantiate the qualification criteria must be attached.
 - 2.4.9. In case the bidder is a Joint venture company, the Joint venture Company or its technical collaborator/Joint venture partner should meet the criteria for performing the work. The bidder should submit Memorandum of Understanding (MoU) / Agreement with their technical collaborator/joint venture partner (in case of Joint venture) clearly indicating their roles under the scope of work.
 - 2.4.10. In case the bid submitted by consortium, the following documents should be enclosed:
 - 2.4.10.1. All the members of the consortium must undertake in their MOU that each party shall be jointly and severally liable to NCAOR for any and all obligations and responsibilities arising out of this contract.
 - 2.4.10.2. The leader of the consortium should confirm unconditional acceptance of full responsibility towards the scope of work of this tender. This confirmation should be submitted along with the techno commercial bid.
- 2.5. ***Price bid (Cover-II)*** should contain the following:
 - 2.5.1. Duly filled in typewritten or printed in ink and also indicating currency of quote whether Indian Rupees or US Dollar must be enclosed strictly as per the PRICE BID FORMAT (Annexure-VI) without any alterations or any conditions, with authorized signatures and stamp. Price bid must be filled considering the following points:
 - 2.5.1.1. Indian bidders should quote in Indian Rupees only.

- 2.5.1.2. The cost of Mobilization and demobilization collectively should not exceed 20% of the total quoted project costs.
- 2.5.1.3. L1 shall be arrived by totaling cost consisting of [1] Lump sum amount towards Mobilization and Demobilization at Chennai Port [2] 2D seismic reflection data acquisition (full fold) charges as per the work standards in the enquiry specifications [3] 2D seismic reflection data processing (up to final stack and migration) charges as per the work standards in the enquiry specifications [4] Gravity data acquisition, processing, and documentation as per enquiry specifications [5] Magnetic data acquisition, processing, and documentation as per enquiry specifications [6] OBS data acquisition and processing (including deployment and recovery) charges (four components – x,y,z and h) as per enquiry specifications [7] Victualling charges as per enquiry specifications.
- 2.6. Both techno commercial and price bids must be submitted to NCAOR under one sealed cover super-scribed **“MARINE GEOPHYSICAL SURVEYS AND PROCESSING WORK IN INDIAN OCEAN”** containing techno commercial bid (Cover-I) and Price bid (Cover-II) in two separate sealed envelopes super-scribed as **“TECHNO COMMERCIAL BID”** AND **“PRICE BID”** respectively not later than 1400 hrs IST, 01st January, 2018 on the following address:
 The Director, National Centre for Antarctic & Ocean Research,
 Ministry of Earth Sciences, Govt. of India,
 Headland Sada, Vasco da Gama, Goa – 403804, India
- 2.7. Ensure that your bid reaches NCAOR, Goa before last date and time for submitting tender. Any bids received after the closing date and time of the tender will not be considered.
- 2.8. Bid bonds should be submitted in the prescribed EMD format (given in Annexure V) or as a DD drawn in favour of NCAOR, Goa along with the techno commercial bid Bank guarantee in physical form. Any foreign bidder who opts to submit the bid bond through bank guarantee (as per the prescribed format given as Annexure V) may send the same through SWIFT MESSAGE after remitting applicable bank charges of State Bank of India, Commercial Branch, Vasco-da-Gama on or before the due date of the tender to the following bank address:

Name of the Beneficiary	National Centre for Antarctic & Ocean Research (NCAOR)
Name & Address of Bank Branch	State Bank of India, Commercial Branch, Shree Vidyadiraj Bhavan, Francisco Luis Gomes Road, Vasco-Da-Gama Goa – 403 802, India.
Bank Account Number	10153336180

Bank Account Type	Saving Account
Bank Branch Code	04116
IFS Code	SBIN0004116
SWIFT CODE	SBININBB229

- 2.9. Bid Bond shall be forfeited in the following events:
- 2.9.1. If the offer is withdrawn during the validity period or any extension thereof.
- 2.9.2. If the offer is altered or modified in a manner not acceptable to NCAOR during the validity period or any extension of the validity duly agreed by the Bidder or after issue of Letter of Intent (LOI) by the NCAOR.
- 2.9.3. If a bidder whose tender has been accepted but fails to enter into the contract within 30 days of LOI issued by NCAOR; and fails to furnish 10% of the total contract value as Delivery cum Performance Bank Guarantee at least 15 days before the expiry of Bid bond.
- 2.10. Bid Bond of unsuccessful bidders will be returned after finalization of the tender. Bid Bond of successful bidder will be returned on receipt of Delivery cum Performance Bank Guarantee.
- 2.11. Ensure that each page of the tender document are signed by the bidder and returned in original to this office along with the bid.
- 2.12. The complete bid including the prices must be type written or printed in Ink. Bids written in pencil will be rejected.
- 2.13. Currency of quote in Indian Rupees for Indian Bidders and in USD for foreign Bidders should be strictly followed in the price bid format (Annexure-VI) else the quotation will be rejected. Currency once quoted will not be allowed to change. The Contract Agreement shall be entered in the currency of quote.
- 2.14. Offer(s) are to be dropped in box placed in NCAOR or may be sent by post or courier. However, NCAOR will not be responsible for delay, loss or non-receipt of application or Tender Document sent by post/courier and will not entertain any correspondence in this regard. Tenders by Fax/E-mail will not be accepted.

3. GENERAL TERMS AND CONDITIONS

- 3.1. NCAOR reserves the right to reject any or all Tenders without assigning any reasons thereof.
- 3.2. In case if the bidder is not the owner, agents or authorized representative should provide a letter from Owners authorizing them to bid on their behalf.
- 3.3. The following critical dates must be adhered to:

Critical Dates	Date (DD/MM/YYYY)	Time (Hrs. Mins)
Tender Publishing date	20.11.2017	11.00
Document download start date	20.11.2017	11.00
Bid Submission start date	20.11.2017	11.00

Document download end date	01.01.2018	14.00
Bid Submission end date	01.01.2018	14.00
Bid opening date	02.01.2018	15.00

- 3.4. In case certain clarifications are sought by NCAOR after opening of tenders, the reply of the bidder should be restricted only to the clarifications sought.
- 3.5. Delay in mobilization and Liquidated Damages (LD):
- 3.5.1. The service provider should mobilize and deploy the required manpower and complete equipment so as to commence the services as specified by NCAOR.
- 3.5.2. Any delay on the part of service provider in mobilization/commencement/handing over of deliverables within the specified period, shall attract LD charges. The LD charges shall be levied as a sum of equivalent to 0.5% (one half percent) of the contract value, for each week of delay or part thereof, subject to maximum of 5% (five percent).
- 3.5.3. Upon receipt of written request for any delays from the service provider, NCAOR shall use its discretion to consider any extension of mobilization/commencement/handing over of deliverables subject to recovery of LD charges as above.
- 3.6. Force Majeure:
- “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:
- 3.6.1. Riot, war, invasion, act of foreign enemies, hostilities (whether war be declared or not) acts of terrorism, civil war, rebellion, revolution, insurrection of military or usurped power,
- 3.6.2. Requisition or compulsory acquisition by any governmental or competent authority; ionizing radiation or contamination, radio activity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive or other hazardous properties of any explosive assembly or nuclear component;
- 3.6.3. Pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds;
- 3.6.4. Earthquakes, flood, fire or other physical natural disaster, but excluding weather conditions regardless of severity.
- 3.7. Arbitration Clause:
- All questions and disputes relating to the meaning of the specifications and instructions herein and as to the quality of work or as to any other question, claim, right, matter or thing whatsoever in any way arising out of or relating to the contract,

designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works or the execution or failure to execute the same whether arising during the progress of the work or after the cancellation, termination, completion or abandonment thereof shall be referred to a sole arbitrator for adjudication through arbitration. The arbitration shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act 1996 of India in an arbitration court in India or any statutory modifications or re-enactment thereof and the rules made there under and for the time being in force, shall apply to the arbitration proceedings. An officer not below the rank of Director, preferably drawn from the panel of Arbitrators drawn by the Government, if any, may be appointed to act as arbitrator by an appointing authority, which should normally be an officer not below the rank of Joint Secretary to the Government.

3.8. Signing of Integrity Pact:

An Integrity Pact is required to be signed between NCAOR and the prospective bidders in order to ensure that the parties are bound by the recommendations of Independent External Monitors (IEMs), in case any complaint related to the contract is found substantiated. The pact essentially envisages an agreement between the prospective bidders and the buyer committing the persons/officials of both the parties not to exercise any corrupt influence on any aspect of the contract. Only those bidders who have entered into such an Integrity Pact with the buyer would be competent to participate in the bidding. The Integrity Pact would be effective from the stage of invitation of bids till the complete execution of the contract. A copy of the Integrity Pact is enclosed as Annexure VIII. NCAOR has implemented the Integrity Pact for which the appointment of the following Independent External Monitors (IEMs) has been done:

3.8.1. Shri Arun Kumar, B 38, Vrindavan Apartment Plot No. 1 Sector 6, Dwarka New Delhi - 110075 (E Mail: kumararun_53@rediffmail.com; Mobile No. 9810621113).

3.8.2. Shri Sushil Gupta, No. B 702, Aravali Heights, Sector 21 C, Faridabad, Haryana - 121001 (E Mail: sushilanitagupta@yahoo.com; Mobile No. 09999744061).

3.9. The successful bidder should agree to enter the contract with NCAOR as per the model agreement given below:

Model Agreement between NCAOR and the 'Bidder'

NATIONAL CENTRE FOR ANTARCTIC & OCEAN RESEARCH (NCAOR),
(MINISTRY OF EARTH SCIENCES, GOVERNMENT OF INDIA) HEADLAND SADA,
VASCO-DA-GAMA, GOA – 403804, INDIA

And

'Bidder'

It is this day mutually agreed between _____ (Name, Address, Owners, Operator) _____ performing with _____ Registry: Head Office: _____ hereby agree to execute the contract _____.

All the tender clauses, terms and conditions and any other clauses deemed fit shall be included in the Agreement and will form integral part of the Agreement.

SECTION - 04

PAYMENT TERMS AND CONDITIONS

1. No advance payment shall be made by NCAOR.
2. Mobilization process should be considered as complete after occupying the designated survey block predefined by NCAOR and shooting at least 10 line km (full fold) of 2D seismic reflection – certified by the authorized representative from NCAOR onboard.
3. NCAOR’s requirement at Chennai Port is one day prior to sailing out to the survey block.
4. Demobilization shall be considered complete once all deliverables are provided to NCAOR.
5. In the price bid format:
 - (a) For S.No. 1, 50% of the mob-demob charges restricting to 20% of the total contract value shall be paid within 15 days after mobilization and balance mob-demob charges will be paid within 15 days of demobilization after submission of invoice to NCAOR.
 - (b) For S.No. 2 to 5, the payment shall be made for every 1000 line km of acquisition and processing respectively duly certified by NCAOR’s representative onboard within 15 days on submission of invoice.
 - (c) For S.No. 6, the payment shall be made after the completion of OBS survey within 15 days of submission of invoice.
 - (d) For S.No. 7, victualing charges shall be paid as per actual on monthly basis against submission of invoice.
 - (e) For S.No. 9, steaming charges must be quoted per nautical mile, however, it will not be considered for price evaluation purpose.
6. On NCAOR’s option, if the vessel is called on any port, except for scheduled port call after the endurance period, NCAOR shall pay the steaming charges (as quoted in S.N. 9 of the price bid format) as well as the port related charges on actual after submission of invoice.

7. No payment shall be made by NCAOR for the period when the vessel is not available to NCAOR and not in a position to provide required service i.e. for the period/services put on off-hire by NCAOR.
8. In case of failure to provide geophysical data as per the work standards of the enquiry specifications, no charges shall be provided.
9. The applicable Tax Deductible at Source (TDS) as per Indian Income Tax Act, 1961 amended from time to time shall be deducted from the gross payment to the bidder. The bidder should provide Permanent Account Number (PAN) for Indian bidders and Tax Identification Number for foreign bidders as per Indian Income Tax Act, 1961.
10. While making the payment all bank charges within India shall be borne by NCAOR and outside of India to the bidder account. Bids shall be evaluated in equivalent Indian Rupees at the Foreign exchange Bill Selling rate as declared by State Bank of India, Vasco-da-Gama, Goa, India, on the day of opening of the techno-commercial bid.
11. GSTN should be provided by the bidder (wherever applicable).

TENDER ACCEPTANCE FORM

To:
The Director
The National Centre for Antarctic and Ocean Research
Headland Sada, Vasco Da Gama,
Goa-403 804, India

1. Having examined the Tender Document NCAOR/CLCS/Tender Document/15.35/2017 dated _____ along with all 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 agree to abide by this Tender for a period of 90 days from the last date fixed for receiving the same and it shall remain binding upon us until the expiration of the offer.
3. We understand that NCAOR is 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:

ANNEXURE – II

(TO BE SUBMITTED WITH TECHNO COMMERCIAL BID – COVER-I)

COMPLIANCE STATEMENT

I/We understand that the bid which does not fulfill any of the following criteria shall be rejected.

S.No.	Compliance clause	Complied/Not complied
1.	Submission of bids in “Two Bid System”. (Techno commercial bid and Price Bid)	
2.	Submission of Bid Bond INR 1,00,00,000 / USD 160,000 along with Techno commercial Bid.	
3.	Mobilization of vessel from Chennai Port, India between 15 th to 21 st March 2018	
4.	Unconditional validity of bid for 90 days from the last date of submission of bid.	
5.	Agree to enter the contract with NCAOR as prescribed in the tender document	
6.	Acceptance for submission of Delivery cum Performance Bank Guarantee for execution of contract for a sum amount of 10% of total project cost, in case of award of contract to the successful bidder.	
7.	List of similar work successfully executed in the last five years (calculated from the closing date of the bid) and projects currently under execution.	
7.	If NCAOR wishes to exercise option for extending the contract for additional surveys then the bidder shall extend the validity of Delivery cum Performance Bank Guarantee for the extended period or shall submit a fresh Delivery cum Performance Bank Guarantee 30 days before the expiry of the Delivery cum Performance Bank Guarantee of the concluding season.	
8.	Offer submitted in original duly signed by the Owners/authorized representative on each page.	
9.	Bidder accepts to render services on specifications, terms and conditions mentioned in the tender document.	
10.	Submission of authority letter from owner, in case bidder is not owner.	
11.	Commitments indicating areas and clients are to be submitted along with the techno commercial bid.	

Signature.....

Name.....

For and on behalf of

.....
.....
.....

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

.....

Date:

CRITERIA FOR TECHNICAL EVALUATION

A. Technical specification of 2D multi-channel seismic data acquisition and processing		
Parameter	Specification	Availability
Energy source	Tuned airgun array	
Minimum Source Volume	5000 cu. in.	
Source depth	5-10 m	
Minimum pressure	2000 psi	
Primary to Bubble Ratio	15:1 or better	
Frequency Band	5-100 Hz	
Peak to Peak amplitude	13 bar-m or better	
Streamer length	6000 m	
Near offset not exceeding	150 m	
Streamer depth	10-20 m	
Group interval	25 m	
Shot interval	50 m	
No. of channels	240	
Record length	16 sec	
Sampling interval	2 ms	
Recording system	Digital	
Cable type	Digital	
Recording format	SEG-D or SEG-Y	
Media (2 copies)	Hard disks	
Polarity	SEG standard	
Hydrophone sensitivity	6-30 $\mu\text{v}/\mu\text{b}$ or better	
Feathering not exceed	10°	
Leakage	< 500 ohm-m	
B. Technical specification of seismic refraction (OBS) data acquisition and processing		
Parameter	Specification	Availability
OBS type	Hydrophone + 3 component geophone	
Minimum Source volume	5000 cu. in.	
Sampling interval	2 ms	
Record length	50 sec	
Navigation and positioning	INS	

C. Technical specification of gravity data acquisition and processing		
Parameter	Specification	Availability
Gravimeter model	Any latest model	
Accuracy	0.01 mGal	
Accuracy for reduced gravity	1.0 mGal	
Drift	2.0 to 3.0 mGal/month	
Sampling interval	Minimum 1 sec	
Measuring range	> 12000 mGal	
D. Technical specification of magnetic data acquisition and processing		
Parameter	Specification	Availability
Magnetometer type	Marine Proton Precession	
Accuracy	Minimum 0.1nT	
No. of channels	2	
Measuring cycle	1-10 sec	
Range	20000-90000 nT	
Sampling interval	Minimum of 1 sec every shot point	
Sensor cable length	~500 m	

Signature.....

Name.....

For and on behalf of

.....

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

.....
 Date:

ANNEXURE – IV

(TO BE SUBMITTED WITH TECHNO COMMERCIAL BID - COVER-I)

DETAILS OF BIDDER

The bidders are advised to give necessary information required by respective point along with documentary support therefore as proof.

		Details	Details of Supporting Document(s) Appended
1	BIDDER/AGENT COMPANY		
	Address		
	Contact Person		
	Contact Number		
	Fax Number		
	Email		
2	REGISTERED OWNER		
	Address		
	Contact Person		
	Contact Number		
	Fax Number		
	Email		

Signature.....

Name.....

For and on behalf of

.....
.....
.....

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

.....

Date:

FORMAT FOR BANK GUARANTEE FOR BID BOND

(To be stamped in accordance with the stamp Act)

To
National Centre for Antarctic & Ocean Research
(Ministry of Earth Sciences, Govt. of India)
Headland Sada, Vasco-da-Gama,
Goa – 403 804 (INDIA)

Dear Sir,

Whereas, National Centre for Antarctic & Ocean Research having its registered office at Headland Sada, Vasco-da-Gama, Goa – 403 804. INDIA (hereafter called as Tenderer which expression shall unless repugnant to context or meaning thereof, including all its successors, administrators, executors and assignees) has floated a tender enquiry for MARINE GEOPHYSICAL SURVEYS AND PROCESSING WORK IN THE INDIAN OCEAN and M/s. _____ having registered _____ office at _____

_____ (hereinafter called the bidder which expression shall, unless repugnant to context or meaning thereof, mean and include all its successors, administrators, executors and assignees) are submitting a Tender Reference No. NCAOR/CLCS/Tender Document/15.35/2017 (hereinafter referred to as Tender) and bidder having agreed to furnish an unconditional and Irrevocable Bank Guarantee of **INR 1,20,00,000.00 / USD 160,000.00 (Indian Rupees One Crore Twenty Lakhs only / US Dollar One Hundred Sixty Thousand only)** towards bid bond/EMD as stated in tender document & notice inviting of global tender & Instructions to Bidder and other terms and conditions of tender especially the condition that bidder shall keep his tender open for a period of 60 days as extended from time to time and shall not withdraw or modify it to which the bidder has given absolute and unconditional acceptance and **60 days i.e. from (last date of receipt of tender) -----** or undertaking and is bound without any reservations as to any matter or thing whatsoever on such acceptance and FOR THE BID BOND/EMD CONDITIONS OF THIS TENDER 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 NCAOR during the period of its validity. 2a) if the tenderer fails to furnish the Performance security for the due performance of the contract. 2b) fails or refuses to execute the contract.

2. Therefore, we _____(Name of Bank)_____ a bank registered under the laws of _____(Country)_____ having head/ registered office at _____(Address)_____ (hereinafter referred to as the Bank which expression shall unless repugnant to the context or meaning thereof, include all its successors, administrators, executors and assignees) hereby issue irrevocable and unconditional bank guarantee and undertake to pay immediately on first demand in writing in **INR 1,20,00,000.00 / USD 160,000.00 (Indian Rupees One Crore Twenty Lakhs only / US Dollar One Hundred Sixty Thousand only)** at any time without any demur, reservations, recourse, context or protest and/or without any reference to the bidder and any such demand made by the NCAOR on the Bank shall be conclusive and binding notwithstanding any difference between the NCAOR and the bidder or any dispute pending before any court, arbitrator or any other authority and/or any other matter whatsoever. We also agree that guarantee herein contained shall be irrevocable unless it is invoked, earlier by the NCAOR in writing. The guarantee shall not be determined/discharged/affected by the liquidated, winding-up, dissolution or insolvency of the bidder and will remain valid, binding and operative against the bank.
3. The Bank also undertakes that the NCAOR at its option shall be entitled to enforce this Guarantee against the Bank as a Principal Debtor, in the first instance, without proceeding against the Bidder.
4. The Bank further agree that as between the Bank and the NCAOR for the purpose this guarantee any notice for the breach of any of the conditions contained in invitation for tender instructions to bidders and other terms and conditions contained in the tender form especially bidder's undertaking that he shall keep his tender open and shall not change it during the validity period or extended period, given to the bank by the NCAOR shall be conclusive and binding on us without any proof, notwithstanding any other matter or difference or dispute whatsoever. We further agree that this guarantee shall not be affected by any change in our constitution, in the constitution of NCAOR or that of the Bidder. We also undertake not to revoke in any case this Guarantee during its currency.
5. The Bank further agree that NCAOR shall have the fullest liberty without affecting in any manner our obligation and without reference to us vary any of the terms and conditions of the tender, instructions to bidders and other terms and conditions contained in the tender and that shall not be released from our liability under the guarantee by reason of any such variation by NCAOR.
6. We also agree that this guarantee shall be governed construed in accordance with Indian Laws subject to exclusive jurisdiction of Indian Courts.
7. Notwithstanding anything contained herein above, our liability under this guarantee is limited to **INR 1,20,00,000.00 / USD 160,000.00** in aggregate and it shall remain in full force up to and including 60 days after _____ (last date of the validity period) unless extended further from time to time, for such period as may be instructed in writing by M/s. _____(*Name of the Bidder*)_____ on whose behalf this guarantee has been given, in which case it shall remain in full force upto and including 30 days after the extended date. Any claim under this guarantee must be received by us from last date of the validity period or before the expiry of 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 NCAOR'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 NCAOR's right under this guarantee shall be valid and shall not cease. In case bidder (hereinafter called "Contractor") becomes successful bidder as declared by NCAOR, i.e. his tender is accepted the validity of this Bank Guarantee will automatically be extended until the Contractor furnishes to the NCAOR a Bank Guarantee for an amount equivalent to 10% of the contract price towards Delivery cum performance guarantee for satisfactory performance of the Contract. In case of failure to furnish the Delivery cum performance Bank Guarantee the claim must be submitted to us within 60 days after last date of validity period or extended period. If no such claim has been received by us within 30 days after the said date/extended date, the NCAOR's right under this guarantee will cease. However, if such claim has been received by us within and upto 30 days after the said date/extended date, all the NCAOR's right under this guarantee shall be valid and shall not cease.

This guarantee is valid until the _____ day of _____ 2018.

The Bank confirms that this Guarantee has been issued with observance of the appropriate exchange-control rules and regulations of the country.

Dated this _____ day of _____, 2018 at _____

Witness:

Signature:

Signature

(Full name in capital letters)
Designation with Bank stamp
Attorney as per Power Attorney

ANNEXURE – VI
(TO BE SUBMITTED WITH PRICE BID – COVER-II)

PRICE BID FORMAT

Instructions for filling Price bid:

- (a) *Indian bidders should quote firm price in Indian Rupees only.*
- (b) *Bidders are advised not to indicate any separate discount. Discount, if any should be merged with the quoted prices.*
- (c) *Price bid without mentioning appropriate currency (Indian Rupees/US Dollar) shall be rejected. The bidder should quote in ONLY ONE currency against each item in the price bid.*
- (d) *Mobilization-demobilization cost should not exceed more than 20% of the total project costs in the price bid format given below.*
- (e) *While making the payment all bank charges within India shall be borne by NCAOR and outside of India to the bidder account. Bids shall be evaluated in equivalent Indian Rupees at the closing market rate of Foreign exchange Bill Selling rate as declared by State Bank of India, Vasco-da-Gama, Goa, India, on the day of opening of techno commercial bid.*
- (f) *NCAOR shall provide a notice for the technical team to arrive at Chennai Port for embarkation.*
- (g) *The applicable Tax Deductible at Source (TDS) as per Indian Income Tax Act, 1961 amended from time to time shall be deducted from the gross payment to the bidder. The bidder should provide Permanent Account Number (PAN) for Indian bidders and Tax Identification Number for foreign bidders as per Indian Income Tax Act, 1961.*
- (h) *The quote should be submitted in the following format:*

S.No.	Description	Quantity	Quote per unit	Quote in INR (Indian bidders should quote in Indian Rupees only)			Quote in USD (Indian bidders should not quote in USD)
				Amount	GST * Amount (indicating applied % as per HSN code)	Total Amount	Total Amount
		(1)	(2)	(1*2 = 3)	(4)	(3+4 = 5)	(1*2 = 6)
1	Lump sum amount towards Mobilization and Demobilization at Chennai Port.	Lump sum					
2	2D seismic reflection data acquisition (full fold) charges per line km as per the work standards in the enquiry specifications.	7000 line km					
3	2D seismic reflection data processing (up to final stack and migration) charges per line km as per the work standards in the enquiry specifications.	7000 line km					
4	Gravity data acquisition, processing, and documentation per line km as per enquiry specifications.	7000 line km					
5	Magnetic data acquisition, processing, and documentation per line km as per enquiry specifications.	7000 line km					

S.No.	Description	Quantity	Quote per unit	Quote in INR (Indian bidders should quote in Indian Rupees only)			Quote in USD (Indian bidders should not quote in USD)
				Amount	GST * Amount (indicating applied % as per HSN code)	Total Amount	Total Amount
		(1)	(2)	(1*2 = 3)	(4)	(3+4 = 5)	(1*2 = 6)
6	OBS data acquisition and processing (including deployment and recovery) charges per node (four components – x,y,z and h) as per enquiry specifications.	20 nodes					
7	Victualling charges per person per day	150 [30 days for 5 pax]					
8	Total cost of the project (S.No. 1 to 7)						
9	Steaming charges must be quoted as per nautical mile (not be considered for price evaluation purpose)						

* GSTN _____ (please indicate).

The price bid evaluation criteria to arrive at the lowest (L1):

L1 shall be arrived by totaling cost consisting of [1] Lump sum amount towards Mobilization and Demobilization at Chennai Port [2] 2D seismic reflection data acquisition (full fold) charges as per the work standards in the enquiry specifications [3] 2D seismic reflection data processing (up to final stack and migration) charges as per the work standards in the enquiry specifications [4] Gravity data acquisition, processing, and documentation as per enquiry specifications [5] Magnetic data acquisition, processing, and documentation as per enquiry specifications [6] OBS data acquisition and processing (including deployment and recovery) charges (four components – x,y,z and h) as per enquiry specifications [7] Victualling charges as per enquiry specifications.

(Bidders Signature & the Seal of the Company /Agency)

ANNEXURE – VII
(TO BE SUBMITTED BY SUCCESSFUL BIDDER
BEFORE EXPIRY OF BID BOND)

**PROFORMA FOR BANK GUARANTEE FOR DELIVERY CUM
PERFORMANCE BOND**

Ref: Bank Guarantee No. _____
Date _____

To

The Director
National Centre for Antarctic & Ocean Research
(Ministry of Earth Sciences, Govt. of India)
Headland Sada, Vasco-da-Gama,
Goa – 403 804 (INDIA)

Dear Sir,

In consideration of National Centre for Antarctic & Ocean Research having its registered office at Headland Sada, Vasco-da-Gama, Goa – 403 804 INDIA (hereinafter referred to as “THE NCAOR”) which expression shall unless repugnant to the context or meaning thereof, include all its successors, administrators, executors and assigns and having entered into a Contract/Notification of Award of Contract dated _____ (hereinafter called “THE CONTRACT”) which expression shall include all the amendments thereto with M/s. _____ (name of Company) _____ having its Head/Registered Office at _____ (address) _____ (hereinafter referred to as “THE CONTRACTOR”) which expression shall unless repugnant to the context or meaning thereof, shall include all its successors, administrators, executors and assigns and the contract having been unequivocally accepted by the Contractor resulting in a contract for a value in agreed currency _____ (of contract value comprising of Mobilization and De-Mobilization Charges). NCAOR having agreed that the Contractor shall furnish to the NCAOR Delivery cum Performance Guarantee for the marine geophysical surveys for the Indian Continental Shelf as faithful performance of the entire contract to the extent of 10% of contract value comprising of Mobilization and De-Mobilization Charges _____.

We (Bank) _____ having its registered office at _____ (hereinafter referred to as “THE BANK”) (which expression shall unless repugnant to the context or meaning thereof, include all the successors, administrators, executors and assigns) do hereby guarantee and undertake to pay on demand to the NCAOR any money or all monies in agreed currency _____ in aggregate on breach of contract by the

contractor 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 NCAOR on the Bank shall be conclusive and binding notwithstanding any difference between NCAOR and the Contractor or any dispute pending before any Court, Tribunal, Arbitrators 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 NCAOR in writing.

2. The NCAOR shall have the fullest liberty, without affecting in any way the liability of the Bank under this Guarantee from time to time, to extend the time for performance of the Contract by the Contractor or NCAOR & Contractor may mutually vary the terms of the Contract. The NCAOR shall have the fullest liberty, without affecting this Guarantee to postpone, from time to time 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 NCAOR and the Contractor or any other course of remedy or security available to NCAOR. The Bank shall not be released of its obligations under these presents by any exercise by the NCAOR of its liberty with reference to matters aforesaid or any of them or by reason of any other act or forbearance or other acts of NCAOR or omission on the part of the NCAOR or other matter of thing whatsoever which under law would, but for this provisions have the effect of relieving the Bank.

3. The Bank also agrees that the NCAOR to its option shall be entitled to enforce this Guarantee against the bank as a principal debtor, in the first instance, without proceeding against the Contractor and notwithstanding any security or other guarantee that NCAOR may have in relation to the Contractor's 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 NCAOR under or by virtue of this Contract have been fully paid and its claim satisfied or discharged or till the NCAOR discharges the guarantee in writing.

6. We further agree that as between us and NCAOR for the purpose of this Guarantee any notice given to us by the NCAOR that the money is payable by the Contractor and any amount claimed in such notice by the NCAOR shall be conclusive and binding on us notwithstanding any difference between the NCAOR and the Contractor or any dispute pending before any Court, Tribunal, Arbitrator or any other 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.

7. Notwithstanding anything contained hereinabove, our liability under this Guarantee is limited to the agreed currency _____ (amount) _____ in aggregate and it shall remain in full force upto and including sixty days after _____ unless extended further, from time to time for such period as may be instructed in writing by _____ M/s. _____ whose behalf this Guarantee has been given in which case it shall remain in full force upto and including sixty (60) days after the extended date. Any claim under this Guarantee must be received by us before the expiry of sixty (60) days from _____ or before the expiry of 60 days

from the extended date, if no such claim have been received by us within the sixty (60) days after the said date/extended date, the NCAOR's right under this Guarantee will cease. However, if such a claim has been received by us within and upto sixty (60) days after the said date/extended date, all the NCAOR's right under this Guarantee shall be valid and shall not cease until we have satisfied that claim.

The Bank confirms that this Guarantee has been issued with observance of the appropriate exchange control rules and regulation of the country.

8. We agree that this guarantee shall be governed and construed in accordance with Indian Laws and subject to the Exclusive Jurisdiction of Indian Court. The Bank also agrees that courts in Goa shall have exclusive jurisdiction.

Date this _____ day of _____ 2018 at _____

WITNESS:

(SIGNATURE)

SIGNATURE:

NAME

NAME & DESIGNATION WITH

BANK STAMP

OFFICIAL ADDRESS

ANNEXURE – VIII
(TO BE SUBMITTED BY PROSPECTIVE BIDDERS)

National Centre for Antarctic and Ocean Research (NCAOR) hereinafter referred to as "The Principal".

.....hereinafter referred to as "Bidder/Contractor"

Preamble

The Principal intends to award, under laid down organizational procedures, contract/s forThe Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relations with its Bidder(s) and /or Contractor(s).

In order to achieve these goals, the Principal will appoint an Independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

1. The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:

a. No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

b. The Principal will during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/additional information through which the Bidder(s) could obtain an advantage in relation to the process or the contract execution.

c. The Principal will exclude from the process all known prejudiced persons.

2. If the Principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions.

Section 2 Commitments of the Bidder(s)/ Contractor(s)

1. The Bidder(s)/Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

a. The Bidder(s)/Contractor(s) will not, directly or through any other persons or firm, offer promise or give to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage or during the execution of the contract.

b. The Bidder(s)/Contractor(s) will not enter with other Bidders in to any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

c. The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act; further the Bidder(s) /Contractors will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

d. The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agents/representatives in India, if any. Similarly, the bidder(s)/contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any. Further details as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/Contractor(s). Further, as mentioned in the Guidelines all the payments made to the Indian agent/representative have to be in Indian Rupees only. Copy of the "Guidelines on Indian Agents of Foreign Suppliers" as annexed and marked as Annexure.

e. The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other internal allies in connection with the award of the contract.

2. The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

Section 3: Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/Contractor(s), before award or during execution has committed a transgression through a violation of Section 2, above or in any other form such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) 'from the tender process or fake action as per the procedure mentioned in the "Guidelines on Banning of business dealings". Copy of the "Guidelines on Banning of business dealings" is annexed and marked as Annex "B".

Section 4: Compensation for Damages

1. If the Principal has disqualified the Bidder(s) from the ' tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.
2. If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminated the contract according to Section 3, the Principal shall" be entitled to demand and recover from the Contractor liquidated damages of the Contract value or the amount equivalent to Performance Bank Guarantee.

Section 5: Previous Transgression

1. The Bidder declares that no previous transgressions occurred in the last three years with any other company in any country conforming to the anti-corruption approach or with any other public sector enterprise in India that could justify his exclusion from the tender process.
2. If the bidder makes incorrect statement on this subject, he can be disqualified from the tender process for action can be taken as per the procedure mentioned in "Guidelines on Banning of business dealings".

Section 6: Equal treatment of all Bidders/Contractors/Subcontractors.

1. The Bidder(s)/Contractor(s) undertake(s) to demand from all subcontractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.
2. The Principal will enter into agreements with identical conditions as this one with

all bidders, contractors and subcontractors.

3. The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

Section 7: Criminal charges against violations by Bidder(s)/Contractor(s)/Subcontractor(s).

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer.

1. The Principal appoints competent and credible independent (External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement

2. The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the Director, NCAOR.

3. The Bidder(s)/Contractor(s) accepts that the Monitor has the right to access without restriction to all project documentation of the Principal including that provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to this project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s)/Subcontractor(s) with confidentiality.

4. The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

5. As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit non binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

6. The Monitor will submit a written report to the Director, NCAOR within 8 to 10

weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.

7. Monitor shall be entitled to compensation on the same terms as being extended provided to Independent members on the NCAOR Board.

8. If the Monitor has reported to the Director NCAOR, a substantiated suspicion of an offence under relevant IPC/PC Act, and the Director NCAOR has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.

9. The word 'Monitor' would include both singular and plural.

Section 9: Pact Duration

This pact begins when both parties have legally signed it. It expires for the Contractor 10 months after the last payment under the contract, and for all other Bidders & months the contract has been awarded.

If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged J determined by Director of NCAOR

Section 10: Other provisions

- This agreement is subject to Indian Law, Place of performance and jurisdiction is the Registered Office of the Principal, i.e. Goa.
- Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

(For & on behalf of the Principal)

(For & On behalf of Bidder/ Contractor)

(Office Seal)

(Office Seal)

Place

Date

Witness 1:

(Name & Address)

Witness 2:

(Name & Address)
