

# **Hydrographic Survey Equipment Installation – mv Anglian Sovereign**

## **Specification v1.2**

*Navigation Safety Branch*

*29 November 2004*

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## Record of Changes

Version	Date	Amendment
Draft for Consultation	19 November 2004	
v1.0	25 November 2004	Various
V1.1	26 November 2004	Backscatter requirements
V1.2	29 November 2004	Changes to schedule dates

## Symbols & Abbreviated Terms

<b>CHP</b>	Civil Hydrography Programme
<b>DGPS</b>	Differential Global Positioning System
<b>GNSS</b>	Global Navigation Satellite System
<b>MCA</b>	Maritime & Coastguard Agency
<b>MRU</b>	Motion Reference Unit
<b>SOLAS</b>	Safety of Life At Sea Convention 1974 as amended
<b>UKHO</b>	United Kingdom Hydrographic Office
<b>UKOOA</b>	United Kingdom Offshore Operators' Association
<b>UPS</b>	Uninterruptible Power Supply

## Acknowledgements

1. Hydrographic Survey Specifications – Shipping Lane 2 (v1.2) 17/10/00  
*Land Information New Zealand*
2. Statement of Requirements – Inshore Vessel 27/01/04 *Director of Naval Survey, Oceanography & Meteorology*

3. Technical Specifications for HI 1059 Western Approaches to English Channel v1.0 20/08/03 – MCA & UKHO

# ***HYDROGRAPHIC SURVEY EQUIPMENT INSTALLATION – MV “ANGLIAN SOVEREIGN”***

## **1 Scope**

This document details the requirements for the installation and commissioning of hydrographic survey equipment onboard the tug “Anglian Sovereign”

## **2 Related Standards**

The most recent versions of the following publications are to be referenced in conjunction with this specification:

1. Hydrographic Quality Assurance Instructions for Admiralty Surveys (HQAs) NP145. *United Kingdom Hydrographic Office*
2. Standards for Hydrographic Surveys. Special Publication No. 44. April 1998. *International Hydrographic Organisation*
3. Guidelines for the use of Differential GPS in Offshore Surveying, 1994 *United Kingdom Offshore Operators’ Association*

## **3 Introduction**

The Maritime & Coastguard Agency (MCA) has overall responsibility for undertaking the Civil Hydrography Programme (CHP).

The CHP is an important element of the United Kingdom’s responsibility for the provision of “hydrographic services” under the Safety Of Life At Sea (SOLAS) convention. There is also a general requirement on the MCA to ensure that the CHP is delivered at best value for money.

The MCA currently manages four Emergency Towing Vessels stationed around the UK. These vessels provide cover in the event of a shipping incident posing a potential threat to the environment.

Whilst providing an extremely important role as intervention vessels, there are usually long periods of time between emergency incidents where the ETVs are standing-by. It is proposed that, during these stand-by times, the vessels could be utilised in support of the CHP.

To this end, this specification details the requirements for permanently fitting out one of the ETVs (the “Anglian Sovereign”) with a multibeam echosounder and various ancillary equipment, together with the requirement to commission this equipment. The vessel is expected to operate, initially, off the North and North East coast of Scotland. She may operate in other UK coastal waters in the future.

After fitting out and testing of the equipment detailed in this specification, the vessel shall be capable of conducting multibeam bathymetric survey operations in accordance with the bathymetric and positional aspects of all standards detailed in section 2 “Related Standards”. Specifically, Multibeam bathymetry gathered by the equipment shall fulfil the “Order 1” requirements of IHO Special Publication 44 in every respect. It is estimated that the vessel will be tasked to survey for around 120 days per year.

The “Anglian Sovereign” is currently on long-term charter to the MCA from Klyne Tugs (Lowestoft) Ltd. This long-term charter expires on 30 September 2009, when there will be an option for the MCA to contract the vessel for a further two years.

The “Anglian Sovereign” is based on an anchor-handling, towing-vessel Rolls Royce Ulstein 719-T hull design. The vessel has an overall length of 67.4m, breadth of 15.5m, a design draft of 5.2m and a displacement of 2,263 GRT. The vessel is classified as Lloyds +100A1 +LMC UMS. Normal operational crew for the vessel is eleven. She was built in 2003 at the Yantai Raffles Shipyard, Shandong, China. Her port of registry is Lowestoft. Details of the vessel can be found at Annex 1. A “General Arrangement” drawing is also included in this specification at Annex 3.

Tenderers are invited to attend a Tender Clarification Meeting which will be held onboard the Anglian Princess (the sister vessel to the Anglian Sovereign) in Falmouth on 15<sup>th</sup> December.

## 4 Project Specifications

No.	Topic	Note
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4.1	Project Nomenclature	
4.1.1	Labelling of documentation & deliverables	<p>Project Name: Hydrographic Survey Equipment Installation – mv “Anglian Sovereign”</p> <p>Contract Number: (To be Advised)</p>

4.2	Installation / Fabrication Work	
4.2.1	Vessel Owners	The contractor shall ensure that any equipment installation and/or modifications to the vessel are undertaken with the vessel owner’s and MCA Contract Manager’s prior knowledge and consent.
4.2.2	Primary role of vessel	The contractor shall ensure that the equipment covered by this specification does not interfere with the primary intervention role of the vessel.
4.2.3	Approval of Modifications	The contractor shall ensure that any equipment installed on the vessel under this contract shall be approved and surveyed by the appropriate authorities, including the Classification Society and the MCA (acting as Flag State), where appropriate. To this end, the contractor shall employ the services of a qualified Naval Architect to prepare submissions.
4.2.4	Equipment Installation	All equipment shall be installed in accordance with manufacturer’s recommendations and shall operate in accordance with manufacturers’ stated performance figures.
4.2.5	Spares	Comprehensive field spares are to be provided for all equipment supplied. The proposed level of spares is to be detailed in the tender.
4.2.6	Electrical Installations	All electrical installations shall be made in accordance with Classification Society and industry standard guidelines, including IEC 60945 standards. Antennae

		shall be mounted at the optimum location for transmittal/reception and shall be located so as to avoid interference by or to other equipment. All external antennae, fastenings, cables and joints shall be resistant to the marine environment.
4.2.7	Power Supply	All equipment installed under this contract shall operate using a clean, uninterruptible power supply (UPS) giving at least ten minutes’ reserve power for all connected items. Spare capacity is currently available on the vessel’s own UPS system, which the contractor may wish to consider using at their own risk.
4.2.8	Cable Routing	In addition to clause 4.2.6 the contractor shall ensure that all cables are routed neatly and permanently. Cable trays are to be installed and used when no suitable trays already exist. Cables are not to be installed in an unsightly manner. Cables are to be terminated on labelled DIN rail mounts in labelled junction-boxes in the Survey Control Room (see Annex 2) and on the bridge. All cable plugs shall be permanently labelled. Internal cable cores shall be sealed to the outer sheath with heat-shrink at cable terminations.
4.2.9	Underwater Sensor Protection	All sensors installed by the contractor which protrude from the vessel hull shall be protected from damage caused by the environment or objects in the water column. Mounting arrangements will be such as to minimise the possibility of objects such as ropes and nets snagging on the sensors. No sensor shall be mounted on the underside of the vessel such that it increases the overall draft of the vessel (i.e. it must not have a depth greater than the lowest part of the stern skeg – See Annex 3).
4.2.10	Maintenance of underwater sensors	Underwater sensors shall be diver-serviceable with wet-matable connections enabling sensor units to be replaced without the need to dry-dock the vessel. Underwater sensors shall be capable of operating for a minimum of two years without the need to remove bio-fouling.
4.2.11	Paint	Where paint on the vessel hull has been disturbed by the contractor, or where steelwork has been added, the contractor shall make good all affected structures with paint specified and approved by the vessel owners.
4.2.12	Dry-Docking	The MCA will arrange and pay for the dry-docking of the vessel so that the contractor can have full access to the underside of the vessel for installation of wet-end sensors for three full days from 8 <sup>th</sup> March 2005 to 10 <sup>th</sup> March

		2005.
4.2.13	Cover Vessel	The MCA will arrange and pay for the provision of a cover vessel to take over the primary role of the Anglian Sovereign from 7 <sup>th</sup> March 2005 until 17 <sup>th</sup> March 2005 to allow for mobilisation and set-to-work trials to be undertaken by the contractor.

4.3	Multibeam System	
4.3.1	General	The contractor shall supply, fit and commission a shallow-water multibeam echosounder capable of measuring water depth from 1m below the transducer to at least 80m water depth
4.3.2	MBES Control system	The multibeam system shall be provided with software which shall enable the multibeam unit to be controlled by external government-furnished online software (e.g. QINSy or Hypack). This software will be operated on PCs which will also be government-furnished. PCs will be situated in the Survey Control Room. The contractor shall ensure that all necessary interface cables are run to patch boxes in the Survey Control Room so that the controller PC can be interfaced to the MBES unit and peripherals.
4.3.3	Depth Accuracy	The overall depth accuracy of processed soundings shall be in accordance with IHO S44 Order 1 in every respect. Overall depth accuracy shall be calculated including an uncertainty for tidal observations of +/- 25cm and an uncertainty for sound velocity in the water column of +/- 0.5m/s. The tender shall include a fully developed error budget detailing the overall depth uncertainty across the useable multibeam swath (see 4.3.6) for all depths and including all likely error contributors.
4.3.4	Target Detection Capability	The multibeam system shall be capable of detecting cubic targets of the minimum dimensions stated for IHO S44 “Order 1” accuracy in all water depths from 5m to 80m at survey speed. Target detection shall be demonstrated by insonifying the target with three “pings” in the along-track direction and three “beams” in the across-track direction. Compliance with this requirement shall also be demonstrated empirically.
4.3.5	Speed of Advance	The integrated MBES system shall be capable of meeting all accuracy and target detection requirements detailed in this specification whilst surveying at speeds up to 8 knots

		(speed over the ground). This shall be verified during the set-to-work trials.
4.3.6	Useable multibeam swath	The system shall be capable of meeting all accuracy and target detection requirements detailed in this specification across a swath sector of 90° (i.e. 2 x water depth).
4.3.7	Depth Precision	Depths shall be measured to a precision of 0.01 metres
4.3.8	Transducer sound velocity	A system capable of continuous measurement of sound velocity at the transducer face shall be provided, installed and commissioned. The system shall be interfaced directly to the MBES system. Sound velocity accuracy shall be measured to +/- 0.05m/sec.
4.3.9	Back-scatter	The MBES system shall be capable of determining and outputting seabed back-scatter (preferably fully calibrated).
4.3.10	Backscatter Values	The MBES system shall provide more than one backscatter value per beam.
4.3.11	Backscatter Parameters	The MBES system shall output (for logging): transmit power level, transmit pulse length and the image sample rate and/or range.
4.3.12	Total Propagated Error	The MBES system and associated peripherals shall be capable of outputting all necessary parameters to calculate Total Propagated Error.
4.3.13	Environmental Constraints	The survey system commissioned on the vessel shall be capable of obtaining MBES data over the useable multibeam swath (see 4.3.6) in accordance with all other clauses of this requirement up to a maximum vessel roll of +/- 15 degrees.
4.3.14	Calibration	During set-to-work trials, the contractor shall calibrate the system for latency, pitch, roll, yaw, heave and pitch/roll cross-talk.
4.3.15	Mounting	The contractor shall mount the MBES transducer in such a position on the vessel so as to minimise acoustic noise interference and the effects of aeration. The transducer mounting shall ensure that no movement of the transducer is possible in relation to the vessel reference frame.
4.3.16	Vessel draft	The contractor shall provide a method of determining vessel water level which falls within the accuracy requirements of the error budget proposed by the

		contractor (see requirement 4.3.3). The contractor may wish to consider (at his own risk) use of the vessel's own Rolls Royce Ulstein UMAS UN980 tank sounding system for the determination of draft.
4.3.17	Sensor Alignment	<p>The offsets between, and relative orientation of, the following equipment shall be derived by land survey techniques/metrology techniques.</p> <p>A Sonar Head</p> <ul style="list-style-type: none"> <li>i. The vertical location of the acoustic centre of the sonar head to <math>\pm 2\text{cm}</math></li> <li>ii. The horizontal location of the acoustic centre of the sonar head to <math>\pm 5\text{cm}</math></li> <li>iii. The heading of the sonar head to <math>\pm 0.25^\circ</math></li> <li>iv. The roll to <math>\pm 0.025^\circ</math></li> <li>v. The pitch to <math>\pm 0.25^\circ</math></li> </ul> <p>B Motion Sensor</p> <ul style="list-style-type: none"> <li>i. Vertical location to <math>\pm 10\text{cm}</math></li> <li>ii. Horizontal location to <math>\pm 5\text{cm}</math></li> <li>iii. Align forward axis with the vessel's reference frame to <math>\pm 0.25^\circ</math></li> </ul> <p>C Heading Sensor</p> <ul style="list-style-type: none"> <li>i. To be aligned with x-axis of vessel's reference frame to <math>\pm 0.25^\circ</math></li> </ul> <p>D Positioning System</p> <ul style="list-style-type: none"> <li>i. Vertical location of antenna to <math>\pm 2\text{cm}</math></li> <li>ii. Horizontal location of antenna to <math>\pm 5\text{cm}</math></li> </ul> <p>E Draft Sensor</p> <ul style="list-style-type: none"> <li>i. Vertical location of Draft Sensor Reference Point to <math>\pm 2\text{cm}</math></li> <li>ii. Horizontal location of Draft Sensor Reference Point to <math>\pm 10\text{cm}</math></li> </ul>
4.3.18	Optimisation of Settings	The MBES equipment shall be capable of automatically detecting and selecting the optimum operational settings (e.g. maximum range, pulse length, power, time variable gain, absorption coefficient etc)

4.4	Positioning System	
4.4.1	General	The contractor shall supply, fit and commission two, fully independent, GNSS positioning systems, capable of ensuring that the overall positional error budget required by the IHO S44 “Order 1” standard is met. A fully developed positional error budget shall be supplied as

		part of the tender.
4.4.2	Air-Time Agreement	The contractor shall clearly state a fixed, firm price for any operating fees charged for the positioning system.
4.4.3	Quality Control	Both GNSS systems shall be capable of calculating and outputting all quality assurance parameters and statistics recommended by UKOOA (see Section 2, “Related Standards”). The system shall also be capable of displaying and printing graphical time series plots of all these QC parameters.
4.4.4	Co-ordination of GNSS base stations.	Differential stations for GNSS systems are to be co-ordinated to an accuracy in accordance with HQAI, Chapter 3, Appendix 1 with respect to a homogenous datum or a derivation thereof such as ETRS89.
4.4.5	Time synchronisation	The GNSS system shall provide PPS time synchronisation. The contractor shall ensure that the GNSS and MBES are synchronised utilising UTC time and the PPS pulse.

4.5	Attitude Sensor	
4.5.1	General	The contractor shall supply, fit and commission one attitude sensor and integrate this fully with the MBES system.
4.5.2	Accuracy	The attitude sensor shall be capable of determining pitch, roll and heading to +/- 0.02° and outputting at 100Hz.
4.5.3	Heave filter	The attitude sensor shall be capable of applying a predictive/historic heave filter in near real time.
4.5.4	Spares	A field spares kit shall be provided. This shall be detailed in the tender.
4.5.5	Set-to-Work trials	During the set-to-work trials period, as well as proving the full functionality of the attitude sensor, the contractor shall also Determine the optimum heave period for the Motion Reference Unit (MRU). The contractor shall also determine the stabilisation period of the MRU after rapid manoeuvres (e.g. vessel turns).

4.6	Survey Operations Room	
4.6.1	Operator Location	All installed equipment shall be capable of being operated from the Survey Control Room (See Annex 2).
4.6.2	Survey Control Room Equipment.	All equipment installed in the Survey Control Room shall be mounted in enclosed 19” rack units or operator consoles. Equipment shall be installed with due consideration to ergonomics, aesthetics and ease of maintenance. Video screens shall be panel-mounted.
4.6.3	Operator consoles	Two work-station consoles shall be provided for survey operators. Each work-station console shall be ergonomically designed and each shall be equipped with two spare 19” flat-panel TFT computer screens (for future use by government-furnished survey processing and navigation software systems). Computers, keyboards and mice are <u>not</u> required to be provided for survey processing and navigation systems under this contract, but space is to be made available for them in the operator consoles. Space shall also be made available at each work-station for paperwork. All necessary monitors and peripherals to operate and monitor the MBES system shall be installed at one of the operator consoles.
4.6.4	Additional Wiring	In addition to the wiring required by the systems installed under this contract, the following wires shall be installed from the Survey Control Room to the forward console of the vessel bridge:  RJ45 network cable and patch boxes 10-core serial cable 8-core twisted pair One VGA cable c/w 15 pin density and a half patch boxes
4.6.5	Phone/Data	The contractor shall install a 900/1800 dual frequency marine antenna for GSM/GPRS phone use. A cable of no lesser quality than low-loss RG213 shall be installed from the antenna to the Survey Control Room. The cable shall be terminated with an N-Type socket in the Survey Control Room. A fixed cellular terminal including voice and GPRS data will be supplied at a later date as Government Furnished Equipment.
4.6.6	Intercom	A “push-to-talk” intercom system shall be installed between one of the operator consoles in the Survey Control Room and the forward console of the bridge.

4.6.7	Chart Table	A chart table of at least A0 size shall be installed in the Survey Control Room. The chart table shall also have at least three drawers capable of storing flat A0 charts.
4.6.8	Power	Operator consoles and rack-mounting must be well served with 24V DC, 240V and 115V AC 50/60 Hz smooth power electrical outlets.

4.7	Maintenance	
4.7.1	Annual Inspection	The contractor shall ensure that a competent engineer will visit the vessel at least once per year to inspect and test all equipment provided. Date and location of such visits will be provided by the MCA, giving one month's prior notice.
4.7.2	Firmware upgrades	The contractor shall ensure that Firmware upgrades released by the manufacturers of all equipment provided are transmitted to the vessel as soon as is practicably possible.
4.7.3	Software upgrades	The contractor shall ensure that Software upgrades released by the manufacturers of all equipment & software provided are transmitted to the vessel as soon as is practicably possible.
4.7.4	Technical support	The contractor shall provide 24-hour technical support by telephone, fax and e-mail for all equipment provided.

4.9	Safety	
4.9.1	Safety Management Plan	Details of the company safety policy and Safety Management Plan shall be supplied as part of the tender.
4.9.2	Liability	Equipment and personnel provided by the Contractor or their subcontractors for work in connection with the contract shall be the Contractor's responsibility at all times. This includes any loss, injury or damage suffered or caused by them.

## 5 Project Documentation

No.	Deliverable	Note
5.1	Wiring Diagram	A detailed wiring diagram shall be provided
5.2	Cable Diagrams	A diagram of each cable, showing terminal numbers shall be provided.
5.3	Operator Manuals	Each item of installed electronic equipment shall be supplied with two complete sets of operator's manuals.
	System Overview	A system over-view diagram shall be provided with the tender.

## Annex 1 – Vessel Details



### ANGLIAN SOVEREIGN

<b>Built</b>	2003 Yantai Raffles Shipyard Shandong China	
<b>Registered</b>	Lowestoft	
<b>Call Sign</b>	VQGD6	
<b>Classification</b>	Lloyds + 100A1 + LMC, UMS	
<b>Gross Tonnage</b>	2263	
<b>NRT</b>	678	
<b>Deadweight</b>	1800	
<b>Lightship</b>	2272	
<b>Crew</b>	11	
<b>Dimensions</b>	<b>LOA</b>	67.40 metres
	<b>Breadth</b>	15.50 metres
	<b>Depth</b>	7.50 metres
	<b>Draft max</b>	6.20 metres

**Deck Capacity**

**Deck cargo** 700 tonnes  
**Deck area** 344 sq metres  
**Deck loading** 10 tonnes sq metre aft of frame 23 otherwise 5/m2  
**Deck Breadth** 12.60 metres  
**Deck Length** 27.30 metres

**Propulsion**

**Main Engines** Two Wartsila 16V 32LND  
**BHP** 16500/12000 KW driving two controllable pitch propellers in fixed nozzles  
**Steering Gear** Tenfjord SR 662 Ulstein independently/synchronized controlled twin high lift rudders

**Thrusters**

**Bowthrusters** 2 electrically driven 9 tonnes/588KW each  
**Sternthrusters** 1 electrically driven 8 tonnes/660KW

**Speed - fuel**

**consumption** 17 knots @ 45 tonnes/day  
 12 knots @ 24 tonnes/day

**Fuel and fresh water capacity**

**Fuel MGO** 1200 m3  
**Potable water** 420 m3  
 Delivery pumps rated at 100 m3/hr

**Deck Equipment**

2 x 10 tonne hydraulic tigger winches  
 1 deck crane SWL 3 tonne @ 15 metres and ROV approved  
 2 x 10 tonne hydraulic capstans aft  
 180 m3 chain lockers  
 2 spray booms with 5 tonne tank for dispersant  
 1 Fast rescue boat

**Towing and anchor handling equipment**

Triple drum Brattvag 300 tonnes hydraulic winch with 450 tonnes brake holding  
 Each drum capable of holding 1500 metres towing wire  
 2 x 1500 metres Anchor Handling Drums  
 Fitted with non-declutchable 3.25” cable lifters port & starboard  
 Main Tow Wire 1500 metres x 76mm  
 Spare Tow Wire 1500metres x 76mm  
 Anchor Handling wire

**Tow stretcher**  
**Powered reel with spare wire**  
**Karm forks rated at 500 tonnes**  
**Stern roller 4.50 metres x 2.50 metres rated at 500 tonne**  
**2 x pennant reels capable of holding 2050 metres 76mm wire each**  
**1 x 3.5 inch gypsy and 1 x 3 inch gypsy**  
**1 xJ Hook**  
**1 x Grapnel**

### **Anchor System**

**Brattvag windlass with two cable lifters of 38mm chain, two mooring drums and two warping ends**  
**2 x Spek anchors each with 460 metres stud link chain**

### **Fire Fighting System**

**FiFi 1                    2 x Skum SFP250 X 350 pumps delivering 1200 m3/hour Through combined water/foam monitors, situated port and starboard**

### **Bridge Equipment**

**Rolls Royce            POSCON Model P450 fully integrated joystick control system with 3 control positions**  
**Autopilot              Anschuetz Nautopilot NP 2010**  
**Gyrocompass        Anschuetz Standard 20 plus (GM)**  
**Radars                 Furuno S-Band FAR2835 S**  
**Furuno X-Band Far 2825**  
**DGPS                  Furuno x 2 GP80**  
**Echosounder         Furuno FE700 with repeater at aft control consul**  
**Speedlog              Furuno DS80**  
**Anemometer         Nunotani 4PN**  
**Weather Fax         Furuno FAX214**  
**Navtex                 Furuno NX50**  
**ECDIS                 Furuno GD380**  
**VideoPlotter         Furuno GD380**

### **Communications Equipment**

**SSB Transceiver Furuno FS-1562-25**  
**DSC                    Furuno DSC-60**  
**VHF                     Furuno 2 x FM850**  
**Furuno 1 x FM8700**  
**GMDSS, handheld VHF McMurdo R2**  
**Handheld UHF sets for general communication**

### **Satcom equipment**

**Furuno Felcom 82a phone Fax, data and telex**

**Felcom 12 telex**

**GSM Equipment**

**Telular corp SX4e phone, fax and data**

**Full automatic telephone exchange serving every area of ship.  
Vingtor ASA-101**

**Fire Detection Equipment**

**Minerva, Model T890. Repeater located in engine control room**

**Accommodation**

- 14 Single cabins all with private facilities**
- 3 Double cabins with private facilities**
- 1 Hospital**
- 1 Ships office**
- 1 Reception/meeting room**
- 1 Crews lounge**

**Air conditioning available throughout**

**Satcom numbers:**

<b>Phone</b>	<b>00 871 323560710</b>
<b>Fax</b>	<b>00 871 323560711</b>
<b>Data</b>	<b>00 871 323560712</b>
<b>Telex</b>	<b>0581 423 560710</b>



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## Annex 2 – Survey Control Room

The Survey Control Room is currently set out as a “Day-Room / Office”. The contractor may remove any furniture currently in the room.



- Survey Control Room Looking Away From Door



- Survey Control Room Looking Towards Door

## **Annex 3 – General Arrangement Diagram**

The following drawing is also available as a TIF image on request:

*This drawing has been removed from this web-supplied document for reasons of commercial confidentiality.*

## Annex 4 - Schedule

The contractor shall ensure that the following time-line and deadlines are adhered to, unless prior agreement is made with the MCA. All dates given are inclusive:

Preparation Work	27/01/05 to 06/03/05
Approval of plans by Class and by MCA	06/03/05
Fit all wet-end equipment in dry-dock	08/03/05 to 10/03/05
Fit dry-end equipment	08/03/05 to 15/03/05
Set-to-work trials	16/03/05 to 18/03/05
All equipment functioning and approved	18/03/04

Any costs incurred due to the above schedule not being achieved, will be met at the contractor's expense.

## Annex 5 – Price

The tenderer must submit the following information in their tender document. The following shall be all-inclusive prices for all the work in accordance with the specification

Design of installation & submission to Class/MCA	£.....+VAT
MBES (incl. installation)	£.....+VAT
Attitude Sensor (incl. installation)	£.....+VAT
Positioning Equipment (incl. installation)	£.....+VAT
Air-time agreement for Positioning System (per day)	£.....+VAT
Survey Operation Room Consoles, Wiring etc	£.....+VAT
Maintenance Agreement (per year)	£.....+VAT
Establishment of Vessel Offsets	£.....+VAT
Set-to-Work Trials	£.....+VAT
<b>TOTAL BID PRICE</b>	<b>£.....+VAT</b>

## **Annex 6 – Evaluation Criteria**

The following broad headings will form the basis of the Tender Evaluation.

They are given in no particular order of priority

1. Track Record for MBES Installations for National Hydrographic Offices
2. Evidence of Compliancy with IHO order 1.
3. Multibeam equipment
4. Positioning Equipment
5. Attitude Sensor
6. Other Equipment
7. Installation Details
8. Set-to-Work Procedures
9. Maintenance Agreement
10. Details/Experience of Key Personnel
11. Level of Spares & Documentation
12. Details of Sub-contractors
13. Safety Management Plan
14. Price

## Annex 7 – Tender Deliverables

Tenders shall include:

- Technical details of Multibeam echosounder
- Technical details of MBES backscatter capabilities.
- Technical details of software and output formats for all equipment.
- Fully developed depth error budget
- Technical details of Position fixing systems.
- Fully developed position error budget
- Motion Reference Unit (MRU) technical details
- Sound velocimeter technical details
- Survey operator consoles & monitors technical details
- Proposed mounting arrangements for all equipment
- Detailed list of spares to be provided
- Details of similar work undertaken previously
- Details of acceptance by national charting authorities of equipment as satisfying IHO “Order 1” standards for depth, position and target detection.
- Details of proposed installation engineers’ competences. (e.g. CVs).
- Proposed checks and calibrations to be undertaken and witnessed during set-to-work trials.
- Proposed methodology for measurement of sensor alignment.
- Details of manuals and documentation to be supplied
- Details of maintenance agreement
- System overview diagram