

# **Hydrographic Survey Services - mv Anglian Sovereign**

## **Specification v1.0**

*Navigation Safety Branch*

*18 January 2005*

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## Record of Changes

Version	Date	Amendment
Draft for Consultation	14 January 2005	
1.0	18 January 2005	Changes from Reviewers

## Symbols & Abbreviated Terms

<b>DGPS</b>	Differential Global Positioning System
<b>GPS</b>	Global Positioning System
<b>GNSS</b>	Global Navigation Satellite System
<b>HI</b>	Hydrographic Instruction
<b>HQAIs</b>	Hydrographic Quality Assurance Instructions
<b>IHO</b>	International Hydrographic Organization
<b>MCA</b>	Maritime & Coastguard Agency
<b>RoS</b>	Report of Survey
<b>RTK</b>	Real Time Kinematic
<b>UKHO</b>	United Kingdom Hydrographic Office
<b>WADGPS</b>	Wide Area DGPS (i.e. multiple reference station)

## Acknowledgements

1. Hydrographic Survey Specifications – Shipping Lane 2 (v1.2) 17/10/00  
*Land Information New Zealand*
2. Technical Specifications for HI1059 Western Approaches to English Channel 20/08/03 United Kingdom Hydrographic Office

3. Hydrographic Survey Equipment Installation – mv Anglian Sovereign  
v1.2 (29/11/2004) *Maritime and Coastguard Agency*  
[http://www.mcga.gov.uk/c4mca/equipment\\_contract\\_specification\\_v1.2.pdf](http://www.mcga.gov.uk/c4mca/equipment_contract_specification_v1.2.pdf)
4. Charter of MV Confidante – Statement of Requirements (27/01/04)  
*Director of Naval Survey, Oceanography & Meteorology*

# **HYDROGRAPHIC SURVEY SERVICES – MV ANGLIAN SOVEREIGN**

## **1 Scope**

This document details the project-specific requirements for conducting survey operations aboard the vessel “Anglian Sovereign”.

## **2 Related Standards**

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

Hydrographic Quality Assurance Instructions for Admiralty Surveys (HQAs) NP145. *United Kingdom Hydrographic Office*

Standards for Hydrographic Surveys. Special Publication No. 44. April 1998. *International Hydrographic Organisation*

## **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 providing a survey team and certain ancillary survey equipment aboard the tug “Anglian Sovereign”. The vessel is expected to operate, initially, off the North and

North East coast of Scotland (see Annex 3). She may operate in other UK coastal waters in the future.

Certain survey equipment will already be installed onboard the vessel under a separate contract and is considered as "Government Furnished Equipment" (see Annex 2). The equipment will have been tested and will 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 for the five-year duration of this contract. However, during the first year of the contract (FY 2005-2006), the vessel may well be tasked with a lower number of operational days.

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 4. A "General Arrangement" drawing is also included in this specification at Annex 6.

Tenderers are invited to attend a Tender Clarification Meeting which will be held in Southampton on 7<sup>th</sup> February 2005.

## 4 Project Specifications

No.	Activity	Required Y/N	Note
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4.1	Equipment Installation		
4.1.1	Vessel Owners	Y	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.
4.1.2	Primary role of vessel	Y	The contractor shall ensure that the equipment covered by this specification does not interfere with the primary intervention role of the vessel.
4.1.3	Manufacturer's Recommendations	Y	The contractor shall ensure that all equipment covered by this contract (including software) is installed and operated in accordance with the manufacturer's recommendations and that the manufacturer's system performance specifications are met at all times.
4.1.4	Mounting of equipment	Y	All equipment and wiring is to be installed in a permanent fashion. All equipment installed in the Survey Control Room shall be mounted in enclosed 19" rack units or operator consoles (some of which shall be provided as Government Furnished Equipment – see Annex 2). Equipment shall be installed with due consideration to ergonomics, aesthetics and ease of maintenance.
4.1.5	Level of spares	Y	The contractor shall provide a sufficient level of spares for the equipment detailed under this contract. The level of spares shall be detailed in the tender.

4.2	Survey Hardware		
4.2.1	Online survey computer	Y	At least one computer, keyboard and mouse (or other tracking device) shall be provided which is capable of running the proposed survey

			acquisition software. 19" flat-panel TFT computer screens will be provided as government furnished equipment (see Annex 2).
4.2.2	Offline survey computer	Y	At least one computer, keyboard and mouse (or other tracking device) shall be provided which is capable of running the proposed data processing software. 19" flat-panel TFT computer screens will be provided as government furnished equipment (see Annex 2).
4.2.3	Network	Y	All computers provided by the contractor shall be linked via a local area network of not less than 100Mbps. Network cabling to the bridge of the vessel is provided as government furnished equipment (see Annex 2).
4.2.4	Network storage device	Y	An online network storage device shall be provided capable of storing all raw and processed data (including interim data sets) which is expected to be acquired over a 2 month period.
4.2.5	Backup storage device	Y	In addition to requirement 4.2.4, the contractor shall also provide hardware capable of backing up all data held on the network storage device to ensure that no more than 6 hours of data is ever lost due to failure or damage of the primary network storage device.
4.2.6	Portable media storage device	Y	The contractor shall provide a means of writing data to a portable media in order that all relevant data can be transferred to shore.
4.2.7	Interfacing equipment	Y	All necessary cables, converters, power supplies etc for interfacing to government furnished equipment shall be provided by the contractor.
4.2.8	Tide observation equipment	Y	The contractor shall be responsible for provision of tidal gauges in order to provide observed tidal measurements at the vessel's location to an accuracy of better than +/- 5cm. The contractor shall provide all necessary equipment for surveying-in and calibrating tidal stations.
4.2.9	Sound velocity observation equipment	Y	The contractor shall provide a probe capable of determining the sound velocity in water to +/- 0.05m/s. All deployment equipment shall also be provided. Sound velocity profiles shall be capable of being logged and applied directly by

			the acquisition software. Calibration certificates for sound velocity probes shall be provided.
4.2.10	Sea-bed sampler	Y	The contractor shall provide a grab-sampler capable of operating to 200m, together with a suitable powered winch and all ancillary equipment.
4.2.11	Maintenance and repair of Government Furnished Equipment	Y	The contractor shall maintain all Government Furnished Equipment (see Annex 2) in accordance with the supplier's recommendations. In the event of failure of any piece of Government Furnished Equipment, the contractor shall immediately inform both the supplier (detailed in Annex 2) and the MCA Project Manager and seek instructions as to how to proceed. If the supplier recommends that the equipment can be repaired by the Contractor, the Contractor shall make every endeavour to effect the repair (in accordance with the supplier's instructions).
4.2.12	Error Budget	Y	The contractor shall provide a fully developed error budget as a tender deliverable. The error budget shall incorporate all component uncertainties from Contractor's <u>and</u> Government furnished survey equipment

4.3	Acquisition Software		
4.3.1	Acquisition software	Y	The contractor shall provide online survey acquisition software capable of interfacing to all government furnished equipment and capable of logging all observed survey data (including quality parameters, backscatter, fully attributed multibeam data, attitude data etc).
4.3.2	Multibeam control	Y	The surveyors shall monitor and operate the multibeam control interface for optimal settings.
4.3.3	Application of sensor offsets	Y	The online acquisition software shall be capable of applying all sensor offsets with regard to a common vessel reference frame.
4.3.4	Application of vessel motion and sound velocity.	Y	The online acquisition software shall be capable of correcting raw multibeam observations with regard to vessel motion (pitch, roll, yaw and

			heave) and ray bending.
4.3.5	Sensor calibration	Y	The online acquisition (and/or post-processing software) shall be capable of calibrating the multibeam echosounder (MBES) with regard to latency, pitch, roll and yaw.
4.3.6	Time synchronisation	Y	The online acquisition software shall be capable of time-stamping all logged data to a common, unambiguous time (provided as a PPS signal from government furnished equipment).
4.3.7	Real-time quality control	Y	The online acquisition software shall be capable of providing real-time quality control displays including: quality of each beam, seabed imaging display, data-density plot, depth contour plot, sun-illuminated depth plot, position quality, seabed profile display, transducer sound velocity, backscatter, navigation track plot etc.
4.3.8	Helmsman's Display	Y	The contractor shall provide a helmsman's display on the vessel bridge. Certain wiring will be pre-installed for this purpose as government furnished equipment (see Annex 2). The helmsman's display shall be capable of being viewed under bright day-time conditions and shall also have a night-time colour setting, together with a dimming facility so as to minimise light pollution at night. Helmsman's display shall provide a seabed coverage plot, planned vessel track, along and across track distance, course made good, speed made good, position and across-track indicator.
4.3.9	Planning	Y	The online acquisition software shall be capable of facilitating the planning of survey operations (line plans etc).
4.3.10	Autopilot	Y	The online acquisition software shall be interfaced to and provide line-keeping information to the vessel's autopilot. Certain wiring will be pre-installed for this purpose as government furnished equipment (see Annex 2)

4.4	Post-Processing Software		
4.4.1	Post-processing software	Y	The contractor shall provide multibeam processing software capable of fully processing data within 24 hours of that data being acquired (i.e. the acquisition/processing ration should be 1:1 or better)
4.4.2	Post-processing methodology	Y	The contractor shall give clear details in the tender of the post-processing methodology, data flow and quality assurance procedures.
4.4.3	Data cleaning	Y	The post-processing software shall be capable of operating using a shoal-biasing algorithm (i.e. preserving shoal soundings)
4.4.4	Quality Control	Y	Robust quality control procedures shall be provided and adhered to during processing of bathymetric data. These procedures shall be detailed as a tender deliverable.
4.4.5	Re-application of tidal data, sound velocity and system offsets	Y	The post-processing software shall be capable of applying and re-applying tidal data (including co-tidal data), sound velocity, system offsets and tidal datums.
4.4.6	Sounding density	Y	The post-processing software shall be capable of displaying the sounding density achieved in order to compare this with IHO target detection requirements.
4.4.7	Filtering of outliers	Y	The post-processing software shall be capable of applying statistical algorithms to aid in the selection and rejection of outlying soundings.
4.4.8	Digital terrain modelling	Y	The post-processing software shall be capable of producing sun-illuminated and colour depth encoded images of digital terrain models.
4.4.9	Cross-section profiles	Y	The post-processing software shall be capable of producing cross-sectional profiles between two selected points.
4.4.10	Cross-line comparisons	Y	The post-processing software shall be capable of producing a statistical analysis between a cross-line and the main data set and compare this to compliancy with IHO depth accuracies.

4.4.11	Backscatter	Y	Post-processing software shall include a multibeam seabed classification system capable of using backscatter and supporting data to segment the survey area into regions based on acoustic similarity, related to seabed type (rock, sand, mud, etc.). The software shall be capable of unsupervised classification, in which the acoustic data are segmented into classes without prior knowledge of ground truth. The software shall provide options either to automatically segment the data into acoustic classes using objective statistical methods, or to allow manual user input in class segmentation. The software shall be capable of using the detailed bathymetric MBES data to compensate the backscatter image before classification by suppressing the dependence of backscatter on grazing angle and other geometrical effects. Vessel attitude data must be used in the compensation process.
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4.5	Consumables		
4.5.1	Portable electronic media	Y	The contractor shall provide all media required for transferring data from ship to shore and for rendering completed surveys to the UK Hydrographic Office.

4.6	Ancillary Equipment		
4.6.1	Phone	Y	The contractor shall install a 900/1800 dual frequency cellular terminal (including voice and GPRS data) in the survey operations room. Note that the antenna and antenna cable for such a phone have been provided and installed as "Government Furnished Equipment" (see Hydrographic Survey Equipment Installation specification). The cable is terminated with an N-Type socket in the Survey Control Room. The contractor shall pay for the air-time agreement for the terminal, as well as all calls made on it by the survey team.
4.6.2	E-mail facilities	Y	The contractor shall install e-mail facilities to enable e-mail communication to the survey team.

4.7	Personnel		
4.7.1	Charge Surveyor	Y	A Charge Surveyor (Party Chief/Surveyor in Charge) shall be on site at all times during survey operations. The Charge Surveyor shall be an IHO/FIG Category A qualified surveyor with a minimum of 5 years offshore surveying experience including surveying for Nautical Charting purposes. The Charge Surveyor shall have the authority and experience to make and implement operational decisions and will be available for the UKHO/MCA to contact regularly to assess progress and modify the survey plan if necessary. The Charge Surveyor's other duties and responsibilities shall be arranged such that they do not interfere with the management of the contract.
4.7.2	Survey Team	Y	The contractor shall list the number, qualifications and experience of the survey personnel as a tender deliverable. Survey teams will include personnel with adequate experience both in charge of and in assisting with all aspects of surveys of complex offshore areas for nautical charting purposes, including office data compilation as well as fieldwork.
4.7.3	Crew Changes	Y	The contractor shall be responsible for all expenses resulting from mobilising, changing out and demobilising the survey crew. Mobilising, crew-changes and demobilising shall coincide with the vessel's normal monthly crew-change schedule. Any extra costs incurred due to delay of the vessel by the survey team (e.g. berthing fees, pilot launches etc) during crew changes will be at the contractor's account.
4.7.4	Working Hours	Y	Survey teams will include sufficient experienced personnel to operate a watch-keeping roster of no worse than 1 in 3. The length of each watch should normally be 4 hours, but 6 hour watches may be kept if desired. Survey Engineers are only to be used in their technical capacity and not as surveyors.

4.8	Sounding		
4.8.1	Sounding of Survey area including Check-lines and Cross-lines	Y	Wherever possible, the MCA will provide details of areas to be sounded at least two weeks prior to operations commencing.
4.8.2	Depth Accuracy	Y	Depth accuracy shall be in accordance with IHO Order 1.
4.8.3	Target Detection	Y	For all parts of the survey area, the minimum size of object detected shall be:  Cube with sides of 2m in depths < 40m  Cube with sides of 10% of depth in depths >40m  Each object (see above) is to be detected by at least 3 valid 'pings' in the along-track direction and 3 valid 'pings' in the across-track direction.
4.8.4	Reduction of Soundings	Y	Soundings shall be reduced for tides in all depths. Soundings are to be presented as depths below Chart Datum.  The contractor shall demonstrate that the method chosen for tidal reduction results in the overall depth accuracy requirements being met (see 4.8.2 & 4.2.12).
4.8.5	Survey line spacing	Y	Line spacing shall be such that requirement 4.8.3 is met in full.
4.8.6	Examinations and elimination of doubtful data	Y	All significant shoals together with suspected wrecks located during the course of the survey shall be reported (with respect to position, orientation, extent and least depth). All such suspected wrecks are to be further investigated by running one survey line, centred over the centre of the wreck and orientated along the long axis and sufficient other lines run at right angles to the first so as to cover the entire length. A definitive list of any newly discovered shoals, together with charting recommendations, shall be presented in every Report of Survey.
4.8.7	Presentation of depth data	Y	Depth data recorded shall be logged to at least two decimal places of a metre.

4.9	Tides & Vertical Control		
4.9.1	Establishment of Tidal stations and Vertical Control	Y	<p>At least two primary tidal stations shall be established within the extents of every HI area. Tidal observations shall cover the duration of survey operations and shall cover a period of at least thirty days. Each tide station shall be levelled to at least two permanently monumented and documented Ordnance Survey benchmarks and referred to Ordnance Datum. Levelling shall be conducted in accordance with HQAIs.</p> <p>Spheroidal heights of any existing or newly established benchmarks shall be determined by dual frequency carrier phase GNSS techniques, tied in to the Ordnance Survey Active Network.</p>
4.9.2	Pole-to-gauge calibration	Y	Automatic tide gauges shall be calibrated against a tidepole in accordance with HQAIs. The exact method of this calibration – including the recording interval and calibration duration shall be included as a tender deliverable.
4.9.3	Reduction of soundings	Y	The contractor shall provide recommendations for observing tides and sounding reduction to MCA for approval as a tender deliverable. Recommendations shall utilise tidal models based on actual tidal observations. It is the contractor's responsibility to ensure that tidal data is of suitable quality to attain IHO Order 1 survey requirements.
4.9.4	Chart Datum	Y	All soundings shall be reduced to Chart Datum. See Table III of Admiralty Tide Tables for present Chart Datum / Ordnance Datum connection.
4.9.5	Transfer of Datum	Y	The contractor shall establish a tide gauge at a standard or secondary port, levelled in to Ordnance Datum, and shall perform a transfer of datum for a minimum of a 39 hour period between this gauge and any newly established gauge in accordance with Admiralty Tidal Handbook No2.
4.9.6	Recording and analysing Tidal Stream information	N	Not presently required

4.9.7	Eddies and Over-falls	Y	Observations are to be rendered in the Report of Survey
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4.10	Positioning & Horizontal Control		
4.10.1	Extension of existing control	Y	Any extension of existing geodetic control and the establishment of new stations shall be fully documented. The derivation of the co-ordinates of existing stations shall be stated. Adjustment of all observations shall be by the method of Least Squares.
4.10.2	Establishment of geodetic stations	Y	All geodetic stations shall be fixed using dual frequency carrier phase GNSS techniques. The Contractor must state how they propose to co-ordinate stations. Where necessary, co-ordinate conversion shall be conducted using the Ordnance Survey (OS) OSTN02 conversion program and an estimated final accuracy stated.
4.10.3	Station marking and documentation	Y	All geodetic stations established during survey operations shall be described, photographed and permanently marked to assist their future recovery in accordance with HQAIs.
4.10.4	Primary offshore Positioning System	Y	As per Government Furnished Equipment (See Annex 2)
4.10.5	Secondary offshore positioning system	Y	As per Government Furnished Equipment (See Annex 2)
4.10.6	Order of Survey Horizontal Accuracy	Y	IHO Order 1
4.10.7	Static Positioning Check	Y	A static positioning check shall be performed at the start of each survey season (methodology shall be detailed in tender)
4.10.8	Dynamic Navigational Calibration	Y	A dynamic positioning check shall be performed at the start of each survey season (methodology shall be detailed in tender)
4.10.9	Primary / Secondary	Y	The contractor shall provide a summary for each survey line showing differences between primary

	Comparisons		and secondary positioning systems.
4.10.10	Quality	Y	The contractor shall log and provide a continuous indication of the quality of the position. This is to be monitored throughout the survey.

4.11	Coastline / Topography		
4.11.1	Obtaining Coastline Data	Y	Coastline and topography shall be obtained in accordance with IHO S44 Order 1. As a minimum, the latest Ordnance Survey 1:10,000 scale mapping shall be obtained and any navigationally significant differences between this and observed survey data are to be reported.

4.12	Miscellaneous Requirements		
4.12.1	Side-scan sonar	N	Not required
4.12.2	Magnetometer	N	Not required
4.12.3	Wire-Sweep	N	Not required – although a recommendation is to be made in the Report of Survey if the surveyor in charge considers it desirable for the MCA to consider any seabed contacts for future wire-sweeping by a suitably equipped vessel.
4.12.4	Bottom Sampling Interval	Y	Seabed samples shall be obtained to ‘ground-truth’ the backscatter data. A regular grid of seabed samples is to be obtained. This grid is to be at intervals of no greater than 10,000m and is to include at least one sample from each seabed texture ‘zone’. The Contractor is to ensure that seabed sampling operations do not damage or interfere with underwater cables and pipelines.
4.12.5	Bottom Sampling Results	Y	Approximately 10% of all seabed samples are to be retained, catalogued and forwarded to the UKHO with the fair records. Plastic screw top containers are to be used to preserve the samples an example of which may be available from the UK Hydrographic Office. The use of polythene bags for preserving retained samples is not acceptable. The selection of retained

			samples must ensure that the samples chosen are spread evenly throughout the area. Samples are to be taken with the ship stopped in the water.
4.12.6	Sound Velocity	Y	The contractor shall observe sound velocity at an interval consistent with the proposed error budget.
4.12.7	Secchi Disk	Y	Secchi disk observations shall be undertaken at intervals no greater than ten miles.
4.12.8	Amendments to sailing directions	Y	The Admiralty Pilot shall be checked in the field and appropriate amendments rendered. Particular attention shall be paid to any recommended approach routes and anchorages within or adjacent to the survey area.
4.12.9	Views for sailing directions	Y	Existing views in The Admiralty Pilot shall be consulted and photographic views obtained if considered useful. New photography shall be in colour and prepared in accordance with NP100. Digital cameras shall have a least 3M pixel resolution.
4.12.10	Permissions	Y	The contractor shall be responsible for arranging all permits, permissions and licenses for access and frequency clearance for all survey operations whether ashore or afloat.
4.12.11	Fixed and floating aids to navigation	Y	The positions of all fixed and floating aids to navigation are to be determined.
4.12.12	Light characteristics	Y	Light characteristics and sectors shall be rendered in accordance with HQAIs.
4.12.13	Fishing Industry	Y	Liaison with, and compensation to, fishermen for loss/damage to fishing gear are matters which rest entirely with the Contractor. The Contractor is to liaise closely with local fisheries groups and the appropriate local District Fisheries Inspectors well in advance of the commencement of fieldwork.
4.12.14	Equipment Approval	Y	Tenders shall include the technical specifications of survey equipment to be used, although MCA reserves the right of approval. Equipment shall not be substituted without prior approval by MCA.

4.12.15	Monthly Status Report	Y	A short (e.g. 2-page) monthly status report detailing progress, planned activities and any problems encountered shall be completed and e-mailed to the MCA Project Manager on a monthly basis.
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4.13	Safety		
4.13.1	Responsibility	Y	Equipment and survey personnel provided by the Contractor for work in connection with the contract shall be the Contractor's responsibility at all times. The said equipment and survey personnel and any loss, injury or damage suffered or caused by them shall be at the Contractor's risk throughout.
4.13.2	Safety Management Plan	Y	Details of the company safety policy and Safety Management Plan shall be supplied as part of the tender.

## 5 Project Deliverables

No.	Deliverable	Required Y/N	Note
5.1	Labelling of records & deliverables	Y	<p>Project Name: As detailed in each Hydrographic Instruction</p> <p>Hydrographic Instruction Number: As detailed in each Hydrographic Instruction</p> <p>Contract Number: (To be Advised)</p> <p>Each rendered item of hard-copy and digital data shall be signed by the Charge Surveyor and is to bear a depiction of the MCA logo, together with the project name and the HI number.</p>
5.2	Required deliverables	Y	<p>The following records shall be rendered in accordance with HQAIs and these instructions for every Hydrographic Instruction:</p> <ul style="list-style-type: none"> <li>a. Navaid Calibration/validation data</li> <li>b. Processed sounding data (Simrad PROC directory, Caris HIPS/SIPS Project directory or GSF format)</li> <li>c. Raw sounding data (proprietary format)</li> <li>d. Digital Report of Survey (UKHO format)</li> <li>e. Co-tidal factors (if used)</li> <li>f. Geodetic data</li> <li>g. Wreck records</li> <li>h. Tidal records</li> <li>i. Amendments to Lights' List and Admiralty Pilot</li> <li>j. Photographic Views</li> <li>k. Miscellaneous observations records</li> <li>l. Backscatter mosaic in high resolution GeoTIFF format</li> <li>m. Seabed classification of backscatter data (digital seabed texture information).</li> <li>n. Sound-velocity records in digital format.</li> </ul>
5.3	Hydrographic Note	Y	Reports of dangers to navigation shall be passed immediately to the UK Hydrographic Office, in accordance with HQAIs.
5.4	Authoritative Standard Sheets	N	Not required
5.5	"H Forms"	Y	"H Forms" have been designed by the UKHO to facilitate checking and validation of rendered

			data. The contractor shall always use the appropriate "H Form" where one exists for a process which is undertaken.
5.6	Digital Data Media	Y	All Data shall be delivered on CD, DVD or USB 2 hard drives.
5.7	Report of Survey (RoS)	Y	A Report of Survey (RoS) shall be rendered in digital format in accordance with the latest UKHO requirements for digital RoS for each Hydrographic Instruction.
5.8	Format of Bathymetric Data	Y	Processed bathymetric data shall be rendered as files in Simrad PROC directory, Caris HIPS/SIPS Project directory or GSF format and shall contain the following attributes for each sounding as a minimum: position and depth; swath and beam number; backscatter intensity; 95% statistical error estimation for position; 95% statistical error estimate for depth. Corresponding raw (i.e. unprocessed) files shall also be supplied in proprietary format. Files shall be full density (i.e. not "thinned") with rejected soundings flagged but not deleted from the data set.
5.9	Comparison with published charts	Y	The sounding detail shown on the largest scale published UKHO chart of the survey area is to be critically examined and any significant differences reported. In particular, a comment is required for any charted dangers that were not discovered during the survey, or where the least depth found over a danger during the survey is deeper than charted. Any other errors, ambiguities or other defects shall be reported on an annotated copy of the chart.
5.10	Presentation of data		A complete set of field records for each Hydrographic Instruction shall be delivered to the UK Hydrographic Office when all points raised in the appraisal have been clarified. The records shall be packaged and labelled using standard forms as supplied by the UK Hydrographic Office. Standard UK Hydrographic Office forms are available through the MCA.
5.11	Retention of data		All raw and processed digital records shall be retained and maintained by the Contractor for a period of 2 years from the date of the final contract payment. On completion of this two year

			period, the Contractor may seek permission from UKHO/MCA to dispose of the data as they so wish.
5.12	Crown copyright		<p>All data and accompanying documents and records, both working and fair, originating from the survey become the property of HM Government and must be handed over on demand. Where appropriate, they are to carry the following official markings:</p> <p style="text-align: center;">CROWN COPYRIGHT 2005 (or year as appropriate)</p> <p style="text-align: center;">FOR OFFICIAL USE ONLY</p>

## 6 Survey Geodesy

Unless otherwise stated, every survey shall be rendered using the following geodetic parameters

Datum: ETRF'89  
Spheroid: GRS '80  
Projection: UTM Grid Zone 30 North (Central Meridian 3° West).

All rendered positions shall be quoted as geographical co-ordinates (i.e. in terms of Lat. / Long) as degrees and decimal minutes.

## Annex 1 – Hydrographic Instructions

If possible, the MCA will issue Hydrographic Instructions (HIs) at least two weeks prior to the commencement of any survey operation.

Each HI will, as a minimum, detail:

- The survey area
- Any deviation from the generic survey specification (currently HQAIs).
- The priority of the survey area.

Each HI will contain a project data pack which will include benchmark details (where available), details of fair-sheets held at the UKHO (where available) and GeoTIFF images of the largest scale UKHO charts of the area.

The MCA will issue a number of HIs within the ETV's patrol area in order to enable the vessel to have a choice of areas in which to survey. The work area of the ETV shall be determined by consultation between the surveyor-in-charge, the master of the vessel and the District Operations Manager for Shetland Coastguard on a monthly cycle

Typically, an HI will represent around two months of survey effort. There is no requirement to complete an HI prior to the vessel moving on to another HI. However, on completion of an HI, the data and a full Report of Survey shall be rendered (in accordance with this specification) within one month.

## Annex 2 – Government Furnished Equipment

Government furnished equipment is detailed in the separate contract specification:

Hydrographic Survey Equipment Installation – mv Anglian Sovereign v1.2 (29/11/2004) *Maritime and Coastguard Agency*

The specification is available for download at:

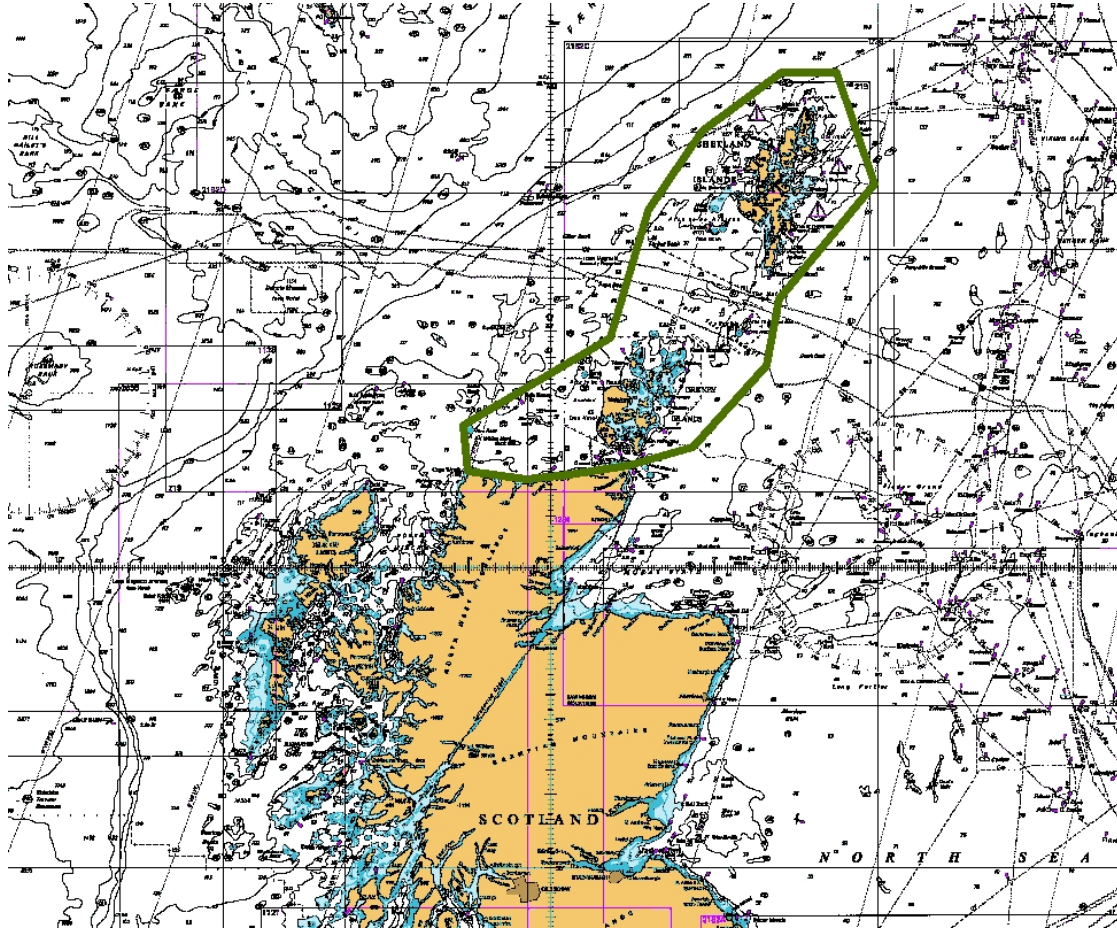
[http://www.mcga.gov.uk/c4mca/equipment\\_contract\\_specification\\_v1.2.pdf](http://www.mcga.gov.uk/c4mca/equipment_contract_specification_v1.2.pdf)

At the time of writing, the supplier of the equipment under the “Hydrographic Survey Equipment Installation” contract has not yet been determined. However, the choice of supplier will be made between the following two companies:

- Kongsberg Maritime Ltd (bidding a EM3002 MBES, together with an Applanix POSMV motion sensor).
- Reson Offshore Ltd (bidding a 7125 MBES, together with an Applanix POSMV motion sensor).

The name of the successful bidder for the “Hydrographic Survey Equipment Installation” contract, together with details of the tendered equipment will be given at the Tender Clarification meeting to be held on 7<sup>th</sup> February 2005.

## Annex 3 – Anglian Sovereign Patrol Area



Reproduced from Admiralty chart BA2 with the permission of Her Majesty's Stationery Office and the UK Hydrographic Office.

The area outlined in green above represents the Anglian Sovereign's approximate patrol area. However, in future years, the vessel may be rotated to a different station in UK coastal waters as operation requirements dictate.

## Annex 4 – 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>	<b>67.40 metres</b>	
	<b>Breadth</b>	<b>15.50 metres</b>	
	<b>Depth</b>	<b>7.50 metres</b>	
	<b>Draft max</b>	<b>6.20 metres</b>	

**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:**

**Phone 00 871 323560710  
Fax 00 871 323560711  
Data 00 871 323560712  
Telex 0581 423 560710**



Klyne Tugs (Lowestoft) Ltd  
Cumberland Place  
Whapload Road  
LOWESTOFT  
Suffolk  
NR332 1UQ

Telephone 01502 515250  
Fax 01502 500225  
Telex 97378  
Email [Klyne-tugs.co.uk](mailto:Klyne-tugs.co.uk)

## Annex 5 – Survey Control Room

The Survey Control Room is currently set out as a “Day-Room / Office”. However, survey consoles, rack mounting, power supplies and chart table will be supplied as “Government Furnished Equipment” (see Annex 2).



- Survey Control Room Looking Away From Door



- Survey Control Room Looking Towards Door

## **Annex 6 – 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 7 – Payment Schedule

The contractor shall only undertake survey operations in the identified areas on approval of the MCA project manager and if they consider that environmental conditions are suitable for producing acceptable survey data.

The following are the stages at which invoices may be submitted to MCA for payment subject to the written agreement of MCA's Project Manager:

1. Mobilisation sum (as detailed in Annex 8) following demonstration of all operational aspects of the survey system, including interfacing and post-processing.
2. Invoices are to be submitted monthly for Operational days (as detailed in Annex 8) completed in the preceding calendar month.
3. Completion of assessment of each HI Report of Survey and data set by the UK Hydrographic Office.

It is planned that mobilisation of Government Furnished Equipment (see Annex 2) will take place in dry dock in Hull towards the end of March 2005. The mobilisation of the permanent survey equipment detailed in this contract shall be undertaken concurrently. This shall be followed by set-to-work trials to prove all equipment and interfacing. A tentative schedule is as follows:

Fit all Government-furnished wet-end equipment in dry-dock	18/03/05 to 21/03/05
Fit & commission equipment under this contract	19/03/05 to 26/03/05
Set-to-work trials	26/03/05 to 29/03/05
All equipment functioning and approved	29/03/05

All costs for the above mobilisation operation (including travel costs of survey team etc) shall be covered in the mobilisation sum as detailed in Annex 8.

## Annex 8 – Price

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

### **Vessel Mobilisation**

£.....+VAT

This shall include the installation, interfacing and testing of all survey equipment (including software) covered by this contract. It shall also include the interfacing of survey equipment covered by this contract with government furnished equipment.

### **Operational Day-Rate**

£.....+VAT

Operational day rate will be paid for each full day (from 00:00 to 23:59) for which the whole survey team is onboard the vessel. Operational day-rate will not be paid for any day in which data-gathering equipment was not fully functional for greater than 1 hour. In addition, operational day-rate will not be paid when the vessel is on location and ready to survey and when the survey team suspend survey data gathering operations for any reason other than weather or equipment failure.

### **Submission & Approval of Report of Survey for each HI** £.....+VAT

This payment shall only be made after the data set and Report of Survey has been submitted to the UK Hydrographic Office and any remedial work requested by them has been carried out by the contractor.

## **Annex 9 – Tender 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 SOLAS Charting Surveys
2. Quality Control Procedures
3. Quality Control Certificates
4. Evidence of Compliancy with IHO order 1.
5. Online Equipment and Software
6. Offline Equipment and Software
7. Ancillary Equipment
8. Tidal Reduction Methodology
9. Calibration Procedures
10. Details of proposed Data Flow
11. Details/Experience of Key Personnel
12. Details of Sub-contractors
13. Safety Management Plan
14. Price