

**AUTHORITY: The Secretary of State for the Home Department**

**acting through Border Force**

**VOLUME 3**

schedule 1 – statement of requirements

SUPPLY AND INSTALLATION OF FIVE [5]

ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM (ECDIS)

March 2019

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**DEFINITIONS**

|  |  |
| --- | --- |
| Acceptance | The issuing of an acceptance document, signed by the Authority following Delivery, installation, commissioning, setting to work of each NSTR and successful completion of Acceptance trials, Training and Snagging Period and delivery of all safety certification, drawings and documentation to the satisfaction of the Authority. |
| CDP | Cardinal date plan - A plan provided by the Supplier mapping out the significant dates for the project |
| COTS | Commercial Off The Shelf |
| Delivery of the Goods | The delivery, installation, commissioning and setting to work of each ECDIS at a time and location agreed by the Authority. |
| Display | The display provided by the Supplier |
| Cutter | A Border Force Patrol Vessel |
| ECDIS | Electronic Chart Display and Information System |
| GPS | Global Positioning System |
| Highlight Reports | A report highlighting the details, cause and effect, of a deviation from the agreed Cardinal Date Plan |
| IBS | Integrated Bridge System, a combination of systems which are interconnected to allow a centralised monitoring and sharing of information from various navigational tools. |
| IEC 61174 | IEC 61174 is the testing standard for type approval of ECDIS |
| Interfaced | The sharing of information created by one piece of equipment to enhance the output of another using a NMEA 0182 as the common communication standard |
| Major Defect | Any defect which causes the ECDIS to be non-operational for safe navigation as defined by SOLAS (74) |
| Minor Defect | Any defect or fault which reduces the specified performance of the ECDIS while maintaining compliance with SOLAS (74) |
| Proven Design | An off the shelf product, for which you are able to show design lineage, which has already been tested and successfully assessed, independently accredited and delivered to a customer of similar characteristics |
| NMEA 0183 | A standard code for combined electrical and data specification for communication between marine electronics such as echo sounder, sonars, anemometer, gyrocompass, autopilot, GPS receivers and many other types of instruments, defined by the National Marine Electronics Association (of America) |
| North Up | When North is represented at the top of a NSTR display, regardless of the direction of travel, the display is said to be North-up |
| NSTR | Navigation Surveillance Tactical Radar |
| SOLAS 74 | Safety of Life at Sea (74) |
| SOP | System Operational Procedures |
| SQEP | Suitably Qualified and Experienced Personnel |
| STW | Set To Work |
| Technical Helpline | A single phone number giving access to a point of contact able to give user friendly assistance to persons experiencing technical problems with any part or operation of the ECDIS. |
| Training | Organised activity imparting information and instructions to improve the NSTR user’s knowledge and performance to help him or her attain a required level of knowledge or skill to operate the NSTR effectively. |
| UPS | Uninterrupted Power Supply |
| VDR | Voyage Data Recorder. The VDR collects data from the interfaced equipment on board the vessel and stores it. |

**Part 1: GENERAL**

1. **Background**
   1. The Authority currently operate a fleet of five (5) sea going patrol craft operating in both UK National and International waters. These craft are designated as Cutters each of which carries two (2) closely spaced Radar units.
   2. The primary roles of the Cutters are: -
      1. To provide a mobile, flexible seaborne force capable of maintaining an effective deterrent against illegal immigration, smuggling and other breaches of the law administered by the Home Office Operational Directorate: Border Force both within and outside the territorial waters of the UK.

1.2.2 To increase maritime intelligence, undertake surveillance and improve international liaison in combating illegal immigration, the smuggling of drugs and movement of instruments of terrorism by sea;

1.2.3 To intercept suspect vessels in territorial and international waters; and

1.2.4 To provide mutual assistance to other EC countries, the Channel Isles, the Isle of Man and other partners on the UK border.

1.3 In addition to these primary responsibilities, Border Force also undertake tasks on behalf of the Ministry of Defence, Maritime and Coastguard Agency, National Crime Agency, Police and UK Fisheries Agencies.

1.4 For the foreseeable future, Border Force Cutters will be involved in the EU Border & Coast Guard Agency’s operations in the Central Mediterranean and Aegean Seas.

1.5 An interfaced combination of the navigation equipment is paramount to achieving the mandated requirements and normal safety of navigation procedures.

1.6 Navigation, Surveillance and Tactical Radars (NSTR) are fitted to all Cutters as an aid to the safe navigational conduct of the ship and to support Situational Awareness (SA), target identification, acquisition, monitoring, tracking, cueing of intercept and legal evidential requirements.

1.7 The current radar systems fitted are part of an interfaced bridge suite containing

* One Kelvin Hughes Manta Digital ‘Sharp Eye’ Solid State Sensor Radar, and
* One Simrad Argus NSTR

1.8 The Authority intends to proceed to full networking capability, and eventually to paperless chart operation. Following the recent acquisition of the Simrad system the Authority wishes to change the KH ECDIS to a matching Simrad System. The required model is a Simrad Maris E900 Mk 15 19” Panel PC Type Approved ECDIS

**Part 2: REQUIREMENTS**

**2. General Requirements**

2.1 The objective of this specification is to provide requirements for the supply and installation of five (5) new Simrad Maris E900 Mk 15 19” Panel PC Type Approved ECDIS and VDRs to replace the KH ECDIS and MDP A5 VDRs currently in use, and to fully integrate them with the Simrad Argus NSTR.

2.2 The Authority requires a ‘turnkey’ solution, that is, the Supplier will provide and install everything that is necessary and will deliver and install a fully operational ECDIS onto each Cutter whose performance is in accordance with this set of specifications. The Supplier will include all software licences, software updates, access codes, encryption codes and encryption keys as applicable as well as any updates as and when required. The Authority will take no part in the sourcing, adaptation, licensing or certification of the component parts, which must be presented upon delivery in a fully usable form.

2.3 The Supplier will appoint a dedicated project manager, as a single point of contact for the Authority for the duration of the contract.

2.4 Detailed work reports for all visits to the Cutters and for workshop repairs are to be provided by the Contractor.  These reports must include as a minimum but are not limited to: Cutter name; date; location; serial number of defective equipment; description of work/defect; description of work completed; and spares used and/or required.  These reports are to be signed by both the Contractor and a representative of the Authority;

2.5 All tasks shall be completed by appropriately qualified and experienced personnel in relation to the equipment being worked on. Comprehensive instructions are to be provided for any operator delivered maintenance.

2.6 The Supplier must identify and comply with all relevant legislation and Health & Safety regulations relating to the work performed in support or furtherance of this contract.

2.7 The Supplier will be expected to liaise with the Port Operator in order to identify and comply with any general regulations and requirements at premises where Goods are installed and in particular will be responsible for providing any documentation necessary to allow the Authority to arrange security passes and permits prior to starting work.

2.8 The Supplier will be expected to clean the working area and remove and dispose of those component parts and that are replaced, and all waste created during the Planned Maintenance process.

**3 Compliance and Integration**

3.1 The ECDIS shall comply with the requirements of *SOLAS 74, Chapter V, Regulation 19. Carriage requirements for shipborne navigational systems and equipment.*

3.2 The ECDIS shall be tested to the standards required in IEC 61174, *Maritime navigation and radiocommunications equipment and systems – Electronic chart display and information systems (ECDIS) – Operational and performance requirements, methods of testing and required test results.*

3.3 The Authority requires an ECDIS that can operate as part of an IBS containing existing solid-state sensor driven and Magnetron Radars and multiple ECDIS capable displays with VDR, including the ability to operate full networking and paperless charts.

3.4 The ECDIS installation should interface with all other components of the IBS. The current components are:

**4207 class** (4 ships)

* Kelvin Hughes Manta Digital ‘Sharp Eye’ Solid State sensor Radar
* Kelvin Hughes (KH) ECDIS
* KH MDP-A1-AAFA Manta Digital display [Processor] (x2)
* KH MDP A5 VDR, Manta Digital Simplified Voyage Data Recorder
* KH interfaced Bridge supply system unit
* Alarm System – Kelvin Hughes Manta Digital Alarm System MDP-A4
* Simrad Argus NSTR
* Simrad MX512 GPS (x2)
* Robertson RGC12 gyro compass + RGC Repeater
* KW 950 E gyro digital repeaters (x2)
* Ambex NMEA distribution units (x2)
* EchoSounder – Skipper IR301 Depth Sounder (GDS101) OMC 139
* Wind display anemometer
* ETN 9130 Marine Filter UPS
* Walker log type 4040 + NMEA interface.
* CHESS Daytime/Night Vision Camera – Chess Dynamics. The system uses Vision4CE software with AIS/ARPA/Radar cursor/waypoint inputs.

**HMC Protector** (1 ship)

* Kelvin Hughes Manta Digital ‘Sharp Eye’ Solid State Sensor Radar
* Kelvin Hughes (KH) Manta Digital ECDIS

KH MDP-A1-AAFA Manta Digital display [Processor] (x2)

* KH MDP A5 VDR, Manta Digital Simplified Voyage Data Recorder
* KH interfaced Bridge supply system unit
* Alarm System – Kelvin Hughes Manta Digital Alarm System MDP-A4
* Simrad Argus NSTR
* EchoSounder – Skipper IR301 Depth Sounder (GDS101)
* Wind Display – Kongsberg OMC 139 Wind display
* DGPS – SIMRAD MX612 Navigation system (x2)
* AIS – SEATEX AIS100
* Gyrocompass – SIMRAD GC80 Gyro compass (x2)
* Speed Log – Walker P1248 Speed Log (John Lillie and Gillie Ltd)
* UPS
* CHESS Daytime/Night Vision Camera – Chess Dynamics. The system uses Vision4CE software with AIS/ARPA/Radar cursor/waypoint inputs.

3.5 The ECDIS shall be supplied with a SIMRAD keyboard

3.6 The existing Simrad Argus NSTR must be able to overlay to the ECDIS for recording voyage data (digital), target watch data (digital) and radar video.

3.7 The ECDIS shall not at any time adversely affect the performance of any other shipboard systems or be affected by interference from them.

3.8 No part of the ECDIS shall cause an adverse increase in ambient noise levels in the working areas of the Cutters whilst the equipment is operating.

**4. Considerations and Constraints**

4.1 The Maximum dimensions of space where current monitor fitted: 535mm wide, 548mm high

Screen Area showing a chart: 513mm wide, 379mm high Current Monitor unit: 520mm wide, 446mm high

4.2 Requirements placed on ship’s services shall also have no detrimental effect when compared with the current fit.

4.4 The ECDIS shall be wired to receive its electrical power from the ship’s emergency batteries via the existing UPS.

4.5 The ECDIS shall suffer no damage in the event that Ship’s power and/or vent supplies to the ECDIS suffers transients or are interrupted without warning.

4.6 The ECDIS shall suffer no damage in the event that ship’s power and/or vent supplies are reinstated after interruption without warning.

4.7 The ECDIS shall provide a display in the following locations;

4.7.1 **4207 Class**: On the Starboard side of the wheelhouse, adjacent to the chart table, in direct replacement of the existing system.

4.7.2 **HMC Protector**: Above the aft chart table and slaved to the existing fwd. starboard monitor.

4.8 The complete ECDIS will be expected to operate for a minimum period of five (5) years during which time operations could be undertaken up to twenty-four (24) hours per day, seven (7) days per week.

4.9 The ECDIS should be fully operational for 99.95% of the time.

**5. Interoperability.**

5.1 The new ECDIS will be installed and set up to interface with the existing Simrad Argus NSTR and listed elements of the existing bridge suite.

5.2 The authority recognises it will not be possible to integrate fully with the existing Kelvin Hughes Sharp Eye Radar, ECDIS or VDR. However, the system will be expected to provide route data information to the existing KH Sharp Eye Radar.

**Part 3: DOCUMENTATION,**

**TRAINING & DELIVERY**

**6 Documentation**

6.1 All documentation, all technical drawings, signs, diagrams, training material and instructions shall be written and provided in English (UK) Language.

6.2 On, or before, delivery one copy per cutter of the full operator, maintainer and guidance documentation, along with electrical and installation drawings, in printed and electronic format, are to be supplied for the relevant Cutter.

6.3 Additionally, one (1) spare set is to be supplied with, or before, delivery of the first ECDIS, for central records and reference.

**7 Training**

7.1 The Authority has a requirement for familiarisation (operator) training to be provided for a minimum of three (3) persons, maximum six (6) persons per Cutter. This training will be required to be delivered onboard, within three (3) days of the successful completion of sea trials. A certificate of competence is to be provided. The Authority requires the ability to purchase further training as required.

It is envisaged that the training will include as a minimum but is not limited to:

* General familiarisation of ECDIS component parts;
* Full ECDIS operation;
* Operation and recording of Data;
* Downloading recordings onto a portable device;
* Operators maintenance requirements;
* Fault finding and use of first aid spares carried on-board; and
* Run through the operation and maintenance manuals.
* Laminated ‘aide memoire’ sheets are to be supplied to each Cutter to assist the crew with system operation.

**8. Mobilisation**

8.1 The Supplier shall submit a draft CDP covering the completion of all planned work with the quotation for this work package in an accessible Microsoft Office document format (Word or Excel) for approval by the Authority.

8.2 The Supplier is to provide Highlight Reports within twenty-four hours of all identified deviations from the CDP.

**9. Delivery, Installation & Commissioning**

9.1 The Supplier shall ensure Delivery of the Goods and full Acceptance at the locations, as specified by the Authority will be completed by the 1st January 2020 or as otherwise agreed in writing by the Authority in an applicable Order or otherwise.

9.2 The Supplier will be responsible for the delivery, installation and commissioning of the ECDIS , which includes the connection and setting to work of each ECDIS onboard of each Cutter.

9.3 All five ECDIS will be delivered and installed at a location in the United Kingdom (UK) before 1st January 2020.

9.4 All costs and arrangements for transport, offloading, delivery, installation and commissioning of each ECDIS will be the responsibility of the Supplier.

9.5 The Supplier will provide a technical representative to attend a sea trial on each Cutter which will be assessed based on the Sea Trial Criteria listed at Annex B, immediately after delivery, installation & commissioning, to demonstrate each ECDIS’s capability and answer any questions on set up and use. The duration of this is expected to be a full day at sea.

9.6 Following delivery, installation and commissioning of each ECDIS onboard each Cutter, the Authority requires a two (2) week Snagging period to enable the Authority to identify any issues. During this period the Supplier will provide a Technical Helpline and will be required to rectify any issues identified. The Supplier shall provide services to ensure the ECDIS is restored to full working condition within forty-eight hours, calculated from the date and time on which the Authority agrees the Supplier personnel can gain access to the ECDIS. The Snagging period will be extended to compensate for any period lost during snagging rectification.

9.7 Acceptance (as defined in the table of Definitions) by the Authority will occur on the successful completion of the Snagging Period.

9.8 Acceptance of each ECDIS on each Cutter will only be deemed valid where an Acceptance Certificate (refer to Annex C) has been completed, agreed and signed by all parties.

**10 Trials**

10.1 The Supplier will provide a technical representative to attend a sea trial for each ECDIS which will be assessed based on the Sea Trial Criteria listed at Annex B, immediately after delivery, installation and commissioning, to demonstrate each ECDIS’ capability and answer any questions on set up and use. The duration of this is expected to be one day.

**11. Acceptance**

11.1 Final acceptance will be the issuing of a Final Acceptance document as at Annex C, signed by the Authority.

11.2 The Final Acceptance document will be issued after:

11.2.1 Successful completion of Trials, complete with Final Trials report.

11.2.2 Delivery of Certificates of Conformity for all new equipment fitted.

**12. Removal of Redundant Systems**

12.1 The ECDIS Supplier, in conjunction with the project team, shall be responsible for the removal and packaging of the redundant systems, modification to ships services and structure and making good of the Cutter’s infrastructure to the satisfaction of the Authority.

12.2 All components of the redundant system shall be individually securely packed and labelled

12.3 Removal of the redundant ECDIS system from each Cutter is to be carried out in an environmentally friendly manner.

12.4 Following the removal of the redundant systems, the Supplier shall be responsible for their return to the Authority location at: Unit 1 Murrills Industrial Estate, Portchester, PO16 9RD.

**Part 4: WARRANTY & CHARGES**

**13 Warranty**

13.1 A minimum two (2) year warranty covering all aspects of the ECDIS and component parts is to be included in the contract and will start automatically on the date of full acceptance of each ECDIS.

13.2 The Supplier shall provide an agreed facility for reporting faults and obtaining technical advice, covering the hours between 08:00 and 18:00, Monday to Sunday, for the logging of faults or data. Response times for such service shall allow for all faults to be logged, given a reference number and resolution plan agreed between all parties within a maximum of forty-eight (48) of the fault being logged.

13.3 The Supplier shall provide warranty repairs in the event that any part of the supplied or repaired ECDIS develops a fault during the duration of the warranty period. The severity of the repair will dictate where repairs are carried out but will be as agreed with the Authority. All Defects will be recorded by the Supplier. Records will include a reference number and a record of all attempts at resolution in order to form the basis of history records for each ECDIS. Copies of the record will be provided to the Authority at monthly intervals.

13.4 In the event that a Warranty - Major Defect is notified to the Supplier that will render any of the Goods non-operational. The Supplier shall provide services to ensure the Goods are restored to full working condition within forty eight (48) hours, calculated from the date and time on which the Authority agrees the Supplier personnel can gain access to the Goods. In the event a Major Defect cannot be rectified within the assigned period, a Rectification Plan must be agreed with the Authority within forty eight (48) hours of identification of the fault.

13.5 In the event that a Warranty - Minor Defect is notified to the Supplier, other than those that will render the Goods non-operational, the Supplier shall provide services to ensure the Goods are restored to full working condition, as quickly as possible, and in any event, within ten (10) working days, calculated from the date and time on which the Authority agrees the Supplier personnel can gain access to the Goods. In the event a Minor Defect cannot be rectified within the assigned period, a Rectification Plan must be agreed with the Authority within forty eight (48) hours of identification of the fault

13.6 All Warranty repair work carried out by the Supplier, including parts, carried out under the terms of this contract will be covered by a warranty or guarantee of at least twelve (12) months or until the end of the original two (2) year Warranty period, whichever is the longest, to run from the date of sign off.

13.7 The Supplier will ensure that they provide coverage for Warranty rectification and Planned Maintenance throughout the UK and in Southern Italy, Greece and Malta.

13.8 The Supplier is to ensure that any Warranty repair records for each of the ECDIS are passed to the Authority within one calendar month of the event.

13.9 The Authority will sign off each Warranty repair visit only when they are satisfied that the works have been carried out and completed satisfactorily

13.10 All Defect repair timescales quoted will be flexible to some extent depending upon severity and/or cutter location but any changes must have prior agreement with the Authority.

**14.0 Charges and Payment**

14.1 On completion the Supplier shall provide the Authority with a completed schedule showing the individual cost breakdown for each item of work for approval. Following approval of this schedule the Supplier will invoice the Authority for 90% of the total amount.

14.2 The remaining 10% shall be invoiced following a one calendar month snag free period in relation to the work completed

14.3 All travel and subsistence costs related to defect repairs shall be recharged at the Home Office reimbursable T&S rates as stipulated in Annex D

**Annex A**

**Trials Criteria**

In order for the Authority to satisfy themselves that Sea Trials for each ECDIS on each Cutter have been carried out successfully the following criteria will need to be covered as a minimum but not limited to:

* General operation explained to operator
* Confirm that all required inputs present and read correctly
* Are official electronic charts (ENC/RNC) being used?
* Has the ECDIS been correctly installed into the structure of the vessel.
* Set up a route of at least 20 legs and observe successful acceptance of full route on both Simrad Argus NSTR and Kelvin Hughes MDSE units.
* Follow a set route of at least 6 legs to obtain a specified period of continuous running at sea [3hrs?].
* Demonstrate the ability to amend a route whilst on passage and pass successfully out to NSTR and MDSE units
* Demonstrate the ability to pass radar picture data and / or target information from NSTR to ECDIS
* Demonstrate the ability to pass chart overlay to NSTR
* Ability to interrogate targets for AIS data
* Is the ADMIRALTY Information Overlay (AIO) available & T&P NMs correctly displayed?
* Confirm that all required data has transferred to the VDR and is reviewable in a standard format.
* Different environmental conditions of Cutter speed weather and sea state [vibration],
* Different bridge equipment set ups to prove lack of interference with or by other equipment
* Electrical Installation.
* Physical installation and security of fittings.
* Ventilation requirements correctly provided
* Is the ECDIS application software being maintained?
* Demonstrate chart folio and update management procedures in real time and using ship’s architecture

**Annex B**

**Example Acceptance Certificate**

Dear Sirs,

**ACCEPTANCE CERTIFICATE**

Vessel:-

Requirements: [***insert description of Requirements***]

We refer to the Contract relating to the ‘Supply and Installation of Five (5) Electronic Chart Display and Information System (ECDIS) between the Authority and **[Contractor]** dated **[ ]**.

We confirm that the Deliverables listed above have been tested successfully in accordance with the Acceptance relevant to those Requirements.

Yours faithfully,

[Name]

[Position]

acting on behalf of the Authority

**Annex C**

**Reimbursable Expenses**

The Supplier may claim the following Reimbursable Expenses at the rates set out below:

1. **Travel**

Standard rate of allowance for private cars

Initial 10,000 miles 40p per mile

Additional miles over the initial 10,000 25p per mile

Public transport rate 23.8p per mile

2. **Hotel rates**

London £125 per night

All other locations other than London £90 per night