Border Force

AUTHORITY: The Secretary of State for the Home Department acting through Border Force

STATEMENT OF REQUIREMENTS

Supply, Installation and Maintenance of five [5] new navigation, surveillance and tactical radars.

March 2021

C20719

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Definitions

Phrase	Definition
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.
Agreed Facility	A single phone number for the Supplier 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 Cutters
AIS	Automatic Identification System
Alongside Berth	A suitable quay/berth with at least 1m depth below Low Water Spring Tides (LWS) at all times complete with access by gangway/brow.
ARPA	Automatic Radar Presentation Aid
Basic Failures	A failure that effects the ability to use the NSTR from a single user position.
BFOO (BFOO)	Border Force Overseeing Officer
BIT	Built In Test
BITE	Built In Test Equipment
Build Delivery Plan	A detailed plan giving key information with regard to the manufacture of all component parts.
Cardinal Date Plan (CDP)	A plan provided by the Supplier mapping out the significant dates for a project
CE	Coverage Envelope. This is the 3 dimensional area where the NSTR is required to reliably detect an object with a specific size and speed.
COTS	Commercial Off The Shelf
Course Up	When the direction of travel is represented at the top of a NSTR display, the display is said to be course-up
CPA	Closest Point of Approach
Critical failures	A failure that effects the ability to use any user position or a failure that prohibits any changes in connectivity (i.e. the NSTR continues to work in the set configuration but cannot be changed) or a failure that prohibits the configuration of equipment (i.e. changing a frequency on a radio remotely).
Cutter	Her Majesty's Cutter (HMC)
Defect Rectification	Work undertaken to resolve any kind of defect identified and listed in the work package at Annex A.
Defects	A basic or critical failure
Delivery of Goods	The delivery, installation, commissioning and setting to work of each NSTR and all loose inventory, spares package, drawings and documentation relating to that NSTR, at a time and location agreed by the Authority
Displays	the display provided by the Supplier
ECDIS	Electronic Chart Display and Information System
EMC	Electro-Magnetic Compatibility (EMC) standards

Phrase	Definition
Emergent work	Any work that emerges from the Planned Maintenance, which is notified to the Supplier in this Statement of Requirements. Any repairs which are required as a direct result of defects found during this package of works.
EO	Electro-optic
EU	European Union
GPS	Global Positioning System
Gracefully	The NSTR will shed tracks according to the following schedule: 1. Those with increasing CPA or TCPA 2. Those beyond current range setting Unless the contact is manually selected for monitoring.
Ground Stabilised	Ground Stabilised is where own Cutter and all targets are referenced to the ground.
Guard Zone	Guard Zones generate visual and audible alarms when targets entered the operator-set zones. One of the Guard Zones can be used as an anchor watch to alert the operator when own Cutter or targets drift away from the set zone.
Head Up	When the vessel's heading is represented at the top of a NSTR display, the display is said to be Head up.
H&S	Health and Safety
IBS	Interfaced Bridge Suite. A combination of systems, which are interconnected to allow a centralized monitoring and sharing of information from various navigational tools.
IEC 61174	IEC 61174 is the testing standard for type approval of ECDIS
IEC 62388:2013	International Standards for Maritime navigation and radiocommunication equipment and systems – Shipborne radar – Performance requirements, methods of testing and required test results
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
IMO	International Maritime Organisation
IR	Infra-Red
ISO	International Standards Organisation
KPI	Key Performance Indicator
Lloyd's Register	Lloyd's Register's Rules and Regulations set standards for the design, construction and lifetime maintenance of ships, offshore units and land-based installations.
LRU	Line Replaceable Unit
Major Defect	Any defect or fault which reduces the performance of the Cutter, so it is unable to perform its duties or which causes the NSTR to be non-operational for safe navigation as defined by SOLAS (74)
Manage	This allows the operator to initiate, delete, manage the data of a track

Phrase	Definition
MARPOL 73/78	MARPOL 73/78 is the International Convention for the Prevention of Pollution from Ships.
MCA	Maritime and Coastguard Agency
Minor Defect	Any defect or fault which reduces the specified performance of the NSTR while maintaining compliance with SOLAS (74)
Mobilisation Plan	A detailed plan giving timeline with key project dates from initiation through to final completion of the contract.
MMSI	Maritime Mobile Service Identities (MMSIs). Nine digit numbers used by digital selective calling (DSC), automatic identification systems (AIS) and certain other equipment to uniquely identify a ship or a coast radio station.
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
Original Equipment Manufacturer (OEM)	The original manufacturer of a piece of equipment.
PPI	Plan Position Indicator
Predicted Motion Vectors	A visible indication on the display showing the predicted route and distance travelled by a target in a set time.
Project Completion	Formal notification by the BFOO, on behalf of the Authority, to the Supplier that the project is completed to a satisfactory standard. The Supplier will be issued a Project Completion Certificate.
Project Conclusion Meeting (PCM)	The mandated close-down meeting between Supplier and BFOO.
Project Initiation Meeting (PIM)	The initial, mandated, meeting between Supplier and BFOO.
Planned Maintenance	The package of works as detailed as detailed in the requirement.
Project Manager	A member of the Supplier's personnel who is responsible for the overall planning and execution of a project.
Progress Report	A report giving details of progress against the agreed CDP
PPI	Plan Position Indicator
Predicted Motion Vectors	A visible indication on the display showing the predicted route and distance travelled by a target in a set time.
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.

Phrase	Definition
Rectification Plan	A plan to rectify a specified defect, giving dates and reasons for relevant actions to effect full rectification of the defect.
RF	Radio Frequency
RIB	Rigid-Inflatable Boat
RWO	Real World Object
SA	Situational Awareness. Collating information to give an awareness of what is happening around a vessel and an understanding what that information means to you now and in the future.
Safe Working Load (SWL)	The maximum load a piece of equipment can safely operate under.
SARTS	Search and Rescue Transponder System
Ships Navigation Datum	The point of reference for all radar observations - which is relative to the ships head. (or pelorus)
Slipway/Dry Dock	A Slipway or Dry Dock of suitable size, complete with dock blocks in accordance with an Authority supplied docking plan and to the satisfaction of the Border Forcer Overseeing Officer complete with safe permanent means of access to the Vessel.
Snagging Period	A period of no less than two weeks during which the NSTR will be operated by the Authority through a range of operating conditions in order to identify and rectify post installation faults or questions.
SOG	Speed Over Ground is the distance travelled in one hour with respect to ground or Earth's surface.
SOLAS 74	Safety of Life at Sea (74)
SOP	System Operational Procedures
Spares	Unless specified as Authority supplied; all spare parts required to complete an overhaul/maintenance/service including paint/anodes
SQEP	Suitably Qualified and Experienced Personnel
SR	System Requirement
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 NSTR.
Training	Organized 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.
True Course	The apparent heading of a target obtained by the combination of the own ship's motion and target's relative motion, expressed as an angular distance from north.
Unique Track	A track associated with and Identified to a single radar target and giving target information unique to that target.
VDR	Voyage Data Recorder. The VDR collects data from the interfaced equipment on board the vessel and stores it.
VLCC	Very Large Crude Carrier

Phrase	Definition
Warranty	A guarantee, issued to the Authority by the Supplier, promising to repair or replace something if necessary, within a specified period.
WHO	World Health Organisation
Working Location	The area in which the Cutter is operational
Work in Wake	This is work involved due to preparation and after the repairs/maintenance works are completed.

Part 1: General

1.0 Background

1.1 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.

1.2 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.

1.3 The current radar systems fitted are part of an interfaced bridge suite containing solid-state sensor driven radars and multiple ECDIS capable displays with VDR. The Authority intends to proceed to full networking capability, and eventually to paperless chart operation.

1.4 The primary roles of the Cutters are: -

1.4.1 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.

1.4.2 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;

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

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

1.5 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.

1.6 The capability of the Radar will therefore be the primary for operational activity at sea and acts as the main interface between Safe Navigation and Law Enforcement Duties.

1.7 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.

1.8 An interfaced combination of the navigation radars and other sensors (e.g. EO/IR, AIS) are paramount to achieving the mandated requirements and normal safety of navigation procedures. These systems are required to detect at operational ranges, provide high continuity tracking and aid identification of targets of interest in a timely manner. The NSTR is key to meeting this mandate.

Part 2: Insurance

2.0 Insurance

2.1 The Supplier is to be able to provide, if asked, a current and in-date insurance certificate that clearly states the limit of liability to be in excess of £15,000,000.00.

2.2 The limit of liability, as expressed in 2.1, is to be for each and every accident or series of accidents arising from the same event.

2.3 The insurance certificate is to include all employees and any individuals sub-contracted to conduct works on behalf of your organisation in the undertaking of this requirement.

2.4 The insurance policy is to cover all specified and implied risks involved in the conduct of this requirements.

2.5 The insurance certificate is to be submitted to the Authority in .pdf format.

Part 3: Objectives, Location and Constraints

3.0 Objectives

3.1 The objective of this specification is to provide requirements for the supply, installation and maintenance of five (5) new NSTR to replace five (5) of the existing Radars.

The new system will comprise of ARGUS 12U/6X W/M5024 CAT2 System - including

3.1.1 12kW Up mast transceiver with 6' Antenna and Performance monitor,

3.1.2 Core unit, Expanded keyboard,

3.1.3 100 target ARPA plus 300 AIS targets and Interswitch.

3.1.4 Simrad M5024, Type approved 24” LCD Monitor.

3.2 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 NSTR onto each Cutter whose performance is in accordance with this set of specifications. 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.

4.0 Location

4.1 The goods should be delivered to the address below;

4.1.1 FAO: Marlon Johnson, Border Force, Unit 1 Murrills Industrial Estate, Portchester, PO16 9RD

4.2 Due to the operational Working Locations of the Cutters, the installation is to be undertaken at a location still to be determined within the United Kingdom. For the purposes of pricing please assume for the installation to be carried out in Portsmouth, UK.

5.0 Constraints

5.1 All specified work must be completed.

5.2 All quotations are to be submitted in currency GBP.

5.3 All work must be completed in accordance with this Specification of Requirements and must be compliant to all applicable standards or Flag State regulations and in accordance with best industry standards.

5.4 All new parts and equipment fitted are to be supportable for a period of three years following installation.

5.5 All new equipment shall be provided with relevant operator & maintenance documentation, and any applicable certification.

5.6 For the purposes of this requirement, the working week is Monday to Friday and consists of five (5) working days.

5.7 The start date for this requirement is to be no later than 24th March 2021.

5.8 The supply and delivery for this requirement must be complete no later than 28th March 2021.

5.9 The installation for this requirement must be complete no later than 30th June 2021.

Part 4: Warranty

6.0 Warranty

6.1 The Supplier shall provide warranty repairs in the event that any of the supplied or repaired parts develops a fault during the parts warranty period as detailed in § 6.3.

6.2 All Work carried out by the Supplier during the period of this contract shall be covered by a two-year Warranty and will start automatically on the date of full acceptance of each NSTR

6.3 All new parts supplied or fitted during the period of this contract shall be covered by a two-year warranty or such other provided warranty if it is longer than the minimum two year commencing from the date of full acceptance of each NSTR

6.4 In the event that a Warranty Major Defect is notified to the Supplier that will render the Cutter non-operational. The Supplier shall provide services to ensure the Cutter 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 Cutter. 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 hours of identification of the potential failure.

6.5 In the event that a Warranty Minor Defect is notified to the Supplier, other than those that will render the Cutter non-operational, the Supplier shall provide services to ensure the Cutter is restored to full working condition, as quickly as possible, and in any event, within ten working days, calculated from the date and time on which the Authority agrees the Supplier personnel can gain access to the Cutter. 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 hours of identification of the potential failure.

Part 5: Emergent Work

7.0 Emergent Work

7.1 Only the Project Engineer can authorise EW.

7.2 The Supplier is to inform the Project Engineer if authorisation to engage on an EW task is made by any member of the vessel's crew or a member of Border Force.

7.3 All identified EW proposals are to be submitted to the Project Engineer on the attached Emergent Work Individual Item Proforma (Annex B) prior to the commencement of any work for authorisation.

7.4 All costs and any time delays to the completion date are to be articulated to the Project Engineer with the EW proposal.

7.5 The Project Engineer will authorise the Emergent Work on behalf of the Authority, if deemed appropriate by the Project Engineer, and provide formal acknowledgement of acceptance of the proposal to the Supplier.

7.6 Any proposals or work that has been undertaken by the Supplier, or a sub-contractor of the Supplier, and that are found to have not been authorised by the Project Engineer in accordance with § 7, upon final invoice submission, will be at the expense of the Supplier and will not be remunerated by the Authority.

7.7 The Project Engineer and the Supplier are to record the cumulative Emergent Work costs on the attached spreadsheet (Annex C), or in a similar format, which will be cross checked and analysed at the Weekly progress meeting.

NB: The Supplier must, therefore, liaise with the Project Engineer for every item of EW that requires consideration before the Supplier commences work.

Part 6: Trials, Certification and Acceptance

8.0 Trials

8.1 Any trials required shall be to prove that the executed work has been carried out satisfactorily and that the various systems can be checked and confirmed as fully and effectively re-commissioned. Other than fuel, all costs related to the operations of test and trials will be the responsibility of the Supplier.

9.0 Certification

9.1 All certification required for regulatory compliance or requested by the Authority shall be supplied enclosed in clear envelopes within a four-ring ring binder, complete with index. An electronic copy shall be forwarded by e-mail to the Authority in an accessible Microsoft Word format.

9.2 All certificates and reports specified as required are to be provided before acceptance.

10.0 Acceptance

10.1 Final acceptance will be the issuing of an Acceptance Certificate (as at Annex D), signed by the Authority.

10.2 The Final Acceptance document will only be issued after:

10.2.1 completion of all specified items of this requirement;

10.2.2 the Supplier has formally presented all certificates to the Project Engineer during a Conclusion Meeting; and

10.2.3 upon successful completion of any trials required for the work undertaken.

Part 7: Charges and Payment

11.0 Charges and Payment

11.1 All invoices are to be submitted in currency GBP.

11.2 All invoice correspondence is to be as per instructions on the Authority-issued PO document only.

11.3 The Supplier will receive one (1) Purchase Order (PO) number for this requirement;

11.4 Upon issue of a PO by the Authority, the Supplier can begin to submit invoices to the email address provided in accordance with the line-items on the PO document ensuring that all mandatory data is on the Invoice.

11.5 All travel and subsistence costs related to warranty defect repairs shall be the responsibility of the Supplier.

11.7 The Supplier is to ensure that every item of specified work has been completed in line with this Specification of Requirements or they have an official acknowledgement from the Project Engineer allowing for non-completion.

11.8 The Supplier is to ensure that all EW tasks are approved by the Project Engineer signed off by the Project Engineer and serialised appropriately and recorded in the EW spreadsheet (Annex C).

11.9 Failure, by the Supplier, to include EW that is compliant with the instructions set out at § 7.0, will result in the Authority being unable to accept them for remuneration. If non-compliant tasks, either specified or emergent, are invoiced for payment, these costs will be rejected by the Authority and they will be at the expense of the Supplier.

NB: The Authority reserves the right to withhold payment from the Supplier, in part or in full, should any, specified or otherwise, condition as expressed in this Specification of requirements, not be successfully met by the Supplier.

Annex A: Specification

Part 1 General

1 Background

1.1 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.

1.2 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.

1.3 The current radar systems fitted are part of an interfaced bridge suite containing solid-state sensor driven radars and multiple ECDIS capable displays with VDR. The Authority intends to proceed to full networking capability, and eventually to paperless chart operation.

2. Role of Border Force Cutters

2.1 The primary roles of the Cutters are: -

2.1.1 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.

2.1.2 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;

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

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

2.2 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.

2.3 The capability of the Radar will therefore be the primary for operational activity at sea and acts as the main interface between Safe Navigation and Law Enforcement Duties.

2.4 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.

2.5 An interfaced combination of the navigation radars and other sensors (e.g. EO/IR, AIS) are paramount to achieving the mandated requirements and normal safety of navigation procedures. These systems are required to detect at operational ranges, provide high continuity tracking and aid identification of targets of interest in a timely manner. The NSTR is key to meeting this mandate.

3 Summary

3.1 The objective of this specification is to provide requirements for the supply, installation and maintenance of five (5) new NSTR to replace five (5) of the existing Radars.

The new system will comprise of ARGUS 12U/6X W/M5024 CAT2 System - including

3.1.1 12kW Up mast transceiver with 6' Antenna and Performance monitor,

3.1.2 Core unit, Expanded keyboard,

3.1.3 100 target ARPA plus 300 AIS targets and Interswitch.

3.1.4 Simrad M5024, Type approved 24” LCD Monitor.

3.2 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 NSTR onto each Cutter whose performance is in accordance with this set of specifications. 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.

Part 2 Requirements and Constraints

4 Compliance and Integration

4.1 The Authority requires the navigation systems to achieve full compliance with International Maritime Organisation (IMO) & SOLAS requirements. A Declaration of compliance should be will be provided.

1. IMO Resolution MSC192 (79) Dated 6 Dec 2004.
2. SOLAS Chapter V Regulation 19 and ANNEX 16- Radar Equipment;

4.2 The NSTR must be certified as being compliant with IEC 62388:2013

4.3 The NSTR shall comply with all UK safety regulations and standards in force, or programmed to be introduced, at the time of the award of contract. A Declaration of conformity with UK Directives, will be provided to include but not limited to: The Health and Safety at Work Act 1974.

4.4 The NSTR must be tested to an appropriate Maritime standard EMC test and certified as being compliant with The Merchant Shipping (Marine Equipment) Regulations 1999 and IEC 60945 (Maritime navigation and radio communication equipment and systems, methods of testing).

4.5 The NSTR shall comply with European Environmental legislation in accordance with:

(i) Marine Equipment Directive, 96/98/EC.
(ii) MARPOL 73/78.
(iii) Environmental Protection Act 1990.

A declaration of compliance will be provided.

4.6 The combination of sensors are required to provide continuous SA in all operational areas and under all environmental conditions therein; such as hot, cold, humid, littoral, open ocean, rain and ducting. The ability of the sensors to perform effectively in all environmental conditions against a wide range of targets is a key requirement.

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

4.8 The new NSTR should be interfaced with all other components of the Interfaced Bridge Suite. 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.

4.9 The NSTR shall not adversely affect the performance of any other shipboard systems or be affected by interference from them

4.10 The NSTR must be capable of recording voyage data (digital), target track data (digital) and radar video (analogue) overlaid to ECDIS. This can be either onto the existing Kelvin Hughes VDR, or the Supplier shall provide a VDR system interfaced with the supplied NSTR. The recording of data shall have no impact on the operational performance of the NSTR.

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

5.0 Considerations and Constraints

5.1 The overall space, size, weight and heat output of the replacement NSTR shall have no significant detrimental effect on Cutter operations when compared with the current fit.
The current fit is a Kelvin Hughes MDP-A1-AAFA Manta Digital display, and processor unit of approximate size Height 530mm, Width 410mm and Depth 297mm.

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

5.3 The NSTR shall not compromise the watertight integrity of Cutters

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

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

5.6 The NSTR shall have facilities to inhibit RF emissions and rotation to allow personnel to safely access all parts of the NSTR to conduct preventative and corrective maintenance and to allow other personnel to proceed aloft in pursuit of their duties.

5.7 The NSTR shall provide a display on the Port side of the wheelhouse Display.

5.8 Displays supplied, as part of the NSTR, shall be capable of displaying plot, video and track data from other sources (e.g. IR Camera suite, ECDIS).

5.9 Each NSTR shall have Automatic NSTR Plotting Aid (ARPA) capability, with the ability to display ARPA information on the selected Displays.

5.10 The complete NSTR will be expected to operate reliably 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.

6.0 Interoperability.

6.1 It is desirable to have an Inter-switching capability between this NSTR and the other Simrad Argus onboard. This is to allow the output from both systems to be switched between the wheelhouse Port and Starboard displays and or one system or the other to be slaved onto another screen

7.0 Performance

7.1 Environmental Conditions

Table 1 describes the environmental conditions in which the SA and tracking sets will be expected to be met. These are consistent with environmental conditions in which patrols are conducted. The NSTR will be expected to meet these requirements.

Table 1

Environmental Condition	Threshold
Sea State	Up to Sea State 4 for RIB, Jet Ski, Small Yacht and Periscope.[1] Up to Sea State 6 for all other targets.[2]
Wind	Mean true wind speed of 70 km/hour.[2]
Rainfall	Up to 4mm/hour.[3]
Sea Temperature	-5°C to +35°C

Environmental Condition	Threshold
Light conditions	Light and dark conditions and cloud cover up to 8 oktas.[4]
Electromagnetic	All naturally occurring electromagnetic environments.

Table of Environmental Conditions Set

Notes

[1] The tracking of small height targets becomes limited above Sea State 4.

[2] A maritime wind speed of 70 km/hour (~38 kts, Beaufort scale 8) is the constant wind required over the surface of the sea to result in sea state 6. Mean wind speed of 110 km/hour is needed to create sea state 8. Sea states above 8 only occur 0.05% of the time and those above 6 only 2% of the time.

[3] Rainfall of 4 mm/hour represents continuous heavy rain. Rainfall up to 10 mm/hour represents very heavy rain, for example experienced during thunderstorms.

[4] In meteorology, an okta is a unit of measurement used to describe the amount of cloud cover at any given location such as a weather station. Sky conditions are estimated in terms of how many eighths of the sky are covered in cloud, ranging from 0 oktas (completely clear sky) through to 8 oktas (completely overcast).

7.2 Performance Requirements

Table 2 describes the probability, minimum range and target type which the NSTR must be able to detect. Note, Scanner height above sea level is 10.0m

Table 2

	Detection and Tracking Range in Sea Conditions	
Target Type	F2/3 [ideal range in brackets]	F4/5 [ideal range in brackets]
30ft yacht with dry sails	7-8’ [8-9]	6’ [7-8’]
RHIB travelling at 25kts	3-4’ [5’]	1-2 [3-4’]
Stationary RHIB	2-3 [3-4]	Nil -1 [2-3]
Wooden FV	7-8 [8-9]	6-7 [7-8]
Coaster	12 [15]	10-12 [14]
Large commercial ship	15-18 [18-20]	15-18 [18-20]
Buoyage	4-5 [5-6]	3-4 [5]

Radar Performance Requirements

Part 3: Documentation

8.0 Documentation.

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

8.2 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.

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

9. Training

9.1 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 NSTR component parts;
- Full NSTR operation;
- Operation and recording of Data;
- Downloading recordings onto a portable device;
- Operators maintenance requirements;
- Fault finding and use of first aid spares carried onboard; 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.

10 Mobilisation

10.1 Prior to commencing work the Supplier will supply the Authority with a Mobilisation Plan giving details of the key project dates.

10.2 Factory acceptance testing must be successfully completed and witnessed by a member of the Authority before delivery of each system to the Authority. Trial results are to be recorded and supplied.

11. Delivery, Installation & Commissioning

11.1 The Supplier will be responsible for the delivery, installation and commissioning, which includes the connection and setting to work of each NSTR onboard each Cutter, which shall be on a date specified by the Authority.

11.2 The Supplier shall ensure Delivery of the Goods and full Acceptance at the locations, as specified by the Authority and by the 28th March 2021 or as otherwise agreed in writing by the Authority in an applicable Order or otherwise.

11.3 The Supplier shall install the goods on all five vessels before 30th June 2021

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

11.5 Not Used

11.6 Not Used

11.7 Following delivery, installation and commissioning of each NSTR 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 NSTR is 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 NSTR. The Snagging period will be extended to compensate for any period lost during snagging rectification.

11.8 In relation to the 4207 class Cutters, a delivery plan for Cutters 2, 3 and 4 will only be finalised on successful Acceptance of the installation on Cutter 1.

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

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

12. Removal of Redundant Systems

12.1 The NSTR 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 Removal of the redundant Radar system from each Cutter is to be carried out in an environmentally friendly manner.

12.3 Following the removal of the redundant systems, the Supplier shall be responsible for their return to Border Force, Unit 1 Murrills Industrial Estate, Portchester, PO16 9RD.

13. Warranty

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

13.2 A minimum of two (2) year warranty covering corrosion to all parts installed outside of the Cutter is to be included in the contract and will start automatically on the date of full acceptance of each NSTR.

13.3 The Supplier shall provide warranty repairs in the event that any part of the NSTR(s) develops a fault during the duration of the warranty period. 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 NSTR. 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 potential failure to meet the KPI.

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 potential failure to meet the KPI

13.6 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.

Part 4: PROVISION OF SERVICES

14.0 Maintenance

14.1 The Authority requires the provision of maintenance services, which is to begin on the expiry of the warranty period.

14.2 The Supplier is required to plan and deliver the appropriate planned maintenance programme(s) to cover the period of three (3) years from the date of acceptance, in accordance with the relevant manufacturer's recommendations.

14.3 The Supplier is required to agree with the Authority, the planned maintenance visit ten (10) days in advance of attendance at a date and location specified by the Authority.

14.4 The Supplier will provide, within the contract pricing, all the labour, consumables and equipment necessary to carry out all scheduled Maintenance as per each manufacturer's recommendations.

14.5 The Contractor is wholly responsible for organising and funding the means of access to the NSTR for Maintenance (for example but not limited to a cherry picker or crane);

15.0 Warranty and Maintenance General Requirements.

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

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

15.3 The provided NSTR should be capable of being quickly repaired or have critical items replaced whilst in situ;

15.4 Cutter downtime for a Major Defect repair should not exceed forty-eight (48) hours from the time the Contractor is given access to the Cutter.

15.5 If a Minor Defect is not repairable onboard then repair action must be taken as quickly as possible but, in all cases should not exceed ten (10) working days.

15.6 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;

15.7 Contractor Personnel engaged in both the Planned Maintenance and defect repairs will be trained and experienced to the normal standards acceptable and applicable in this industry; Comprehensive instructions are to be provided for any operator delivered maintenance.

15.8 All Planned Maintenance/defect 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; and

15.9 The Supplier is to ensure that any Planned Maintenance and defect repair records during the warranty period for each of the NSTR are passed to the Authority within one calendar month of the event.

15.10 All travel and subsistence costs associated with both Planned Maintenance and Warranty will be the Suppliers responsibility.

15.11 The necessary Planned Maintenance visits are normally to be undertaken between the hours of 08.00 and 18.00, though the Authority may exceptionally require work to be completed outside of these hours for operational reasons.

15.12 The Authority will sign off each Planned Maintenance/defect repair visit only when they are satisfied that the works have been carried out and completed satisfactorily

15.13 All Planned Maintenance/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.

15.14 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.

15.15 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.

15.16 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.

15.17 Any extra or remedial work arising from the Supplier not completing the Planned Maintenance to the required standard, is to be undertaken at no additional cost to the Authority.

Annex B: Emergent Work Individual Item Proforma

Emergent Work (EW) Individual Item Proforma	Border Force

EMERGENT WORK ITEM No:	
Description	
Signed, PROJECT ENGINEER:	**Date:**
PART I: By Supplier	
The above item is accepted as a genuine Emergent work item.	
Our Firm Price is* Our Realistic Estimate is*	**£**
Signed:	**Position:**
	Dated:
TIME PENALTY (if any) ..... The completion date of the contract* will/will not be affected by this item.	
PART II: By Project Engineer	
It is agreed that this is a genuine emergent work item and authority is given for the work to be undertaken.	
The Above Firm Price/Realistic Estimate* of £	**ACCEPTED** / **REJECTED**
Signed:	**Date:**

Notes:
***- Delete as required**

All interactions pertaining to Emergent Work are to be carried out strictly in accordance with Section 10, Sub-sections, 10.1- 10.5, inclusive.

Annex C: Emergent Work item Record Spreadsheet

HMC [INSERT NAME]			Border Force
Supplier:		**RUNNING TOTAL**	**£0.00**
Contract Number:	**C20719**	**EMERGENT WORK DETAILS**	
MTL Project Lead:		**LABOUR**	**£0.00**
		SUB-CONTRACT? % PROFIT	**£0.00**
PROJECT ENGINEER:		**MATERIALS INC? % PROFIT**	**£0.00**

EMERGENT WORK NUMBER	JOB DESCRIPTION	LABOUR COST	SUB-CONT COST	MATERIAL COST	TOTAL COST	% COMP
C20719/001						
Totals						

Annex D: Acceptance Certificate

Acceptance Certificate

Border Force

PART I: to be completed by Supplier

HMC [INSERT NAME]

HMC [INSERT NAME] having completed contract C20719 to the satisfaction of the Authority and having successfully completed all trials and provided all documentation required under the Authority's Contract No C20719 is this day offered for acceptance by the Border Force.

Signed:	For and on Behalf of the Supplier:
Print Name:	Date:

PART II: to be completed by The Authority

By Vessel Commander:

I attended the trials of HMC [INSERT NAME] and have satisfied myself that all systems, machinery and equipment are working satisfactorily. I have inspected the Cutter and consider she is in a condition suitable for return to operational service. Outstanding items are noted as attached.

Signed:	Print Name / Post:

By Border Force Overseeing Officer:
HMC [INSERT NAME] having completed contract C20719 to the satisfaction of the Authority and having completed all trials and documentation required under the Contract is hereby accepted at……. hours.

Signed:	Project Engineer
Print Name:	Date:

PART III: Outstanding Items

Any outstanding items are to be noted, appended to this form and signed by both the Supplier and the Authority. Dates when these outstanding items are to be "completed by" are to be agreed and shown.

Distribution
Original - Retained by the Supplier
Copies to - Project Engineer

Annex E: Sea Trials Criteria

Sea Trials Criteria

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

- A variety of contacts estimated to conform to the performance requirements
- Different environmental conditions
- Different set ups to prove lack of interference
- General performance Parameters
- Operational performance

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Any enquiries regarding this publication should be sent, For the Attention of, Adam Jones via email at adam.jones43@homeoffice.gov.uk .